Application of SOUTHERN CALIFORNIA GAS COMPANY for authority to update its gas revenue requirement and base rates effective January 1, 2016 (U 904-G)	))))

Application No. 14-11-004

Exhibit No.: (SCG-12-WP-R)

REVISED WORKPAPERS TO

PREPARED DIRECT TESTIMONY

OF ANN D. AYRES

ON BEHALF OF SOUTHERN CALIFORNIA GAS COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

MARCH 2015

2016 General Rate Case - REVISED

INDEX OF WORKPAPERS

Exhibit SCG-12-WP-R - CS - INFORMATION

Overall Summary For Exhibit No. SCG-12-WP-R

Area: **CS - INFORMATION**

Witness: **Ann D. Ayres**

	In 2013 $ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
Description	**2013**	**2014**	**2015**	**2016**
Non-Shared Services	17,073	19,166	22,843	24,635
Shared Services	2,912	3,206	3,302	3,398
Total	**19,985**	**22,372**	**26,145**	**28,033**

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres

Summary of Non-Shared Services Workpapers:

	In 2013 $ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
Description	**2013**	**2014**	**2015**	**2016**
A. Customer Engagement & Insights	5,919	6,637	8,262	8,891
B. Customer Assistance	2,834	3,400	4,003	4,253
C. Customer Segment Markets	8,320	9,129	10,578	11,491
Total	**17,073**	**19,166**	**22,843**	**24,635**

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Customer Engagement & Insights
Workpaper: 2IN001.000

Summary for Category: A. Customer Engagement & Insights

	In 2013$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	1,543	1,644	2,099	2,458
Non-Labor	4,377	4,993	6,163	6,433
NSE	0	0	0	0
Total	**5,920**	**6,637**	**8,262**	**8,891**
FTE	17.0	18.0	23.0	27.0

Workpapers belonging to this Category:

2IN001.000 CI-Customer Engagement & Insights

Labor	1,543	1,644	2,099	2,458
Non-Labor	4,377	4,993	6,163	6,433
NSE	0	0	0	0
Total	**5,920**	**6,637**	**8,262**	**8,891**
FTE	17.0	18.0	23.0	27.0

Note: Totals may include rounding differences.

Beginning of Workpaper
2IN001.000 - CI-Customer Engagement & Insights

Area:	CS - INFORMATION
Witness:	Ann D. Ayres
Category:	A. Customer Engagement & Insights
Category-Sub	1. Customer Engagement & Insights
Workpaper:	2IN001.000 - CI-Customer Engagement & Insights

Activity Description:

The Customer Engagement & Insights organization manages four primary areas:

1. Customer Marketing & Communications
This area oversees development and execution of marketing and communications strategies to support various business partners with meeting their specific program's goals and objectives. This includes monitoring and analyzing market trends, evaluating customer research, identifying target markets and developing strategies to communicate with various customer segments and increase customer engagement.

2. Creative Services
Creative Services manages day-to-day activities associated with graphic design, scheduling and production for bill enclosures, as well as for various printed and electronic materials, such as brochures, flyers, posters and newsletters, stewarding brand vision and protecting brand equity. This area also is responsible for organizing and implementing external outreach events.

3. Customer Insights & Analytics
Manages all primary and secondary customer research to monitor customer satisfaction and experience, providing insight into what influences and drives consumer behavior, customer needs and perception. Responsible for advising on customer insights as it pertains to business practices, and provides analytical support with quantitative and qualitative studies.

4. eServices & Data Analysis
This area oversees the development, implementation, maintenance, and support of various customer experience platforms, which include desktop, tablet, mobile applications, and mobile media. In addition to customer experience platforms, this area also oversees the governance, management, and strategic direction for intranet, internet, e-mail, mobile web, social media and other electronic customer communications and service-delivery channels.

Forecast Explanations:

Labor - 5-YR Average

Labor costs in this organization fluctuated across the recorded 5-year period in support of various program activities. 5-year average forecasting methodology was adopted to reflect continual support of core business functions and activities without overstating, understating, or selectively isolating particular historical labor expenses which may nominally fluctuate according to various program activities this group supports. Additionally, 5-year historical average is consistent with all other Customer Service - Information areas, with additional forecast adjustments to account for specific new program growth and new responsibilities.

Non-Labor - 5-YR Average

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Customer Engagement & Insights
Category-Sub 1. Customer Engagement & Insights
Workpaper: 2IN001.000 - CI-Customer Engagement & Insights

Non-Labor costs in this organization fluctuated across the recorded 5-year period, with the 2010 year reflecting periodic, reoccurring expenses such as consultant/market research studies and licensing/subscription renewals for software and media in support of various program activities. For consistency with the Customer Service - Information forecasting methodologies for other accounts, and in consideration of periodic expenses, 5 year average is used as the basis for TY2016 forecast to avoid overstating, understating, or selectively isolating particular historical labor expenses, with adjustments to account for new specific program expenses above historic levels.

NSE - 5-YR Average

Not applicable

Summary of Results:

	In 2013$ (000) Incurred Costs							
	Adjusted-Recorded					Adjusted-Forecast		
Years	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labor	1,266	1,912	1,846	1,655	1,543	1,644	2,099	2,458
Non-Labor	4,386	6,461	5,127	4,612	4,377	4,993	6,163	6,433
NSE	0	0	0	0	0	0	0	0
Total	**5,651**	**8,373**	**6,973**	**6,267**	**5,919**	**6,637**	**8,262**	**8,891**
FTE	13.1	20.3	21.3	18.1	17.0	18.0	23.0	27.0

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Customer Engagement & Insights
Category-Sub: 1. Customer Engagement & Insights
Workpaper: 2IN001.000 - CI-Customer Engagement & Insights

Forecast Summary:

In 2013 $(000) Incurred Costs										
Forecast Method		**Base Forecast**			**Forecast Adjustments**			**Adjusted-Forecast**		
Years		**2014**	**2015**	**2016**	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Labor	5-YR Average	1,644	1,644	1,644	0	455	814	1,644	2,099	2,458
Non-Labor	5-YR Average	4,993	4,993	4,993	0	1,170	1,440	4,993	6,163	6,433
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		**6,637**	**6,637**	**6,637**	**0**	**1,625**	**2,254**	**6,637**	**8,262**	**8,891**
FTE	5-YR Average	18.0	18.0	18.0	0.0	5.0	9.0	18.0	23.0	27.0

Forecast Adjustment Details:

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2014 Total	**0**	**0**	**0**	**0**	**0.0**	
2015	455	0	0	455	5.0	1-Sided Adj

Incremental labor costs needed to support expanded functions in the following areas: Customer Insight & Analytics (1 research analyst), Creative Services (1 community outreach advisor, 1 creative services advisor), and eServices & Data Analysis (1 e-Service designer, 1 eService analyst).

2015	0	270	0	270	0.0	1-Sided Adj

Customer Insight & Analytics: $160 for Incremental non-labor expenses required to support expanded qualitative research that works in conjunction with quantitative research panels to provide metrics on concepts and media tests through the online customer community; $30 to build business email and phone # database for research and communication outreach; and $80 to manage and produce survey content to mobile channels.

2015	0	170	0	170	0.0	1-Sided Adj

Customer Insight & Analytics: Incremental non-labor expenses required to support expanded and new annual costs attributed to the Customer Research Online Panel studies for quantitative research of the online customer community's current needs, values, and expectations.

2015	0	280	0	280	0.0	1-Sided Adj

eServices & Data Analysis: $215 for incremental non-labor expenses attributed to annual maintenance of mobile applications, enhancements, and promotion; $5 for annual socalgas.com refresh expenses; and $60 for annual intranet gaslines.com platform maintenance.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Customer Engagement & Insights
Category-Sub: 1. Customer Engagement & Insights
Workpaper: 2IN001.000 - CI-Customer Engagement & Insights

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2015	0	300	0	300	0.0	1-Sided Adj

Customer Marketing & Communications: Incremental non-labor expenses required to support expanded services in the areas of increased company-wide safety messaging and social media outlets (additional engagement and ad campaigns, production of additional video content, and enhance current social media software tools for metrics to track effectiveness of social media efforts).

2015	0	150	0	150	0.0	1-Sided Adj

Creative Services: Incremental non-labor expenses required to support development of hard-to-reach community media messages, traveling expenses, flyers, pamphlets, promotional material, and booth costs for regional/local events.

2015 Total	**455**	**1,170**	**0**	**1,625**	**5.0**	
2016	814	0	0	814	9.0	1-Sided Adj

Incremental labor costs needed to support expanded functions in the following areas: Customer Marketing & Communications (1 social media advisor, 1 communication advisor), Customer Insight & Analytics (1 research analyst), Creative Services (1 community outreach advisor, 1 creative services advisor),and eServices & Data Analysis (1 e-Service designer, 2 eService analysts, 1 web editor).

2016	0	280	0	280	0.0	1-Sided Adj

eServices & Data Analysis: $215 for incremental non-labor expenses attributed to annual maintenance of mobile applications, enhancements, and promotion; $5 for annual socalgas.com refresh expenses; and $60 for annual intranet gaslines.com platform maintenance.

2016	0	270	0	270	0.0	1-Sided Adj

Customer Insights & Analytics: $150 incremental non-labor expenses required to support expanded Customer Experience Survey to include social media surveys, and $120 for customer behavioral data collection and analysis.

2016	0	270	0	270	0.0	1-Sided Adj

Customer Insight & Analytics: $160 for Incremental non-labor expenses required to support expanded qualitative research that works in conjunction with quantitative research panels to provide metrics on concepts and media tests through the online customer community; $30 to build business email and phone # database for research and communication outreach; and $80 to manage and produce survey content to mobile channels.

Note: Totals may include rounding differences.

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Workpaper: 2IN001.000 - CI-Customer Engagement & Insights

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2016	0	170	0	170	0.0	1-Sided Adj

Customer Insight & Analytics: Incremental non-labor expenses required to support expanded and new annual costs attributed to the Customer Research Online Panel studies for quantitative research of the online customer community's current needs, values, and expectations.

2016	0	300	0	300	0.0	1-Sided Adj

Customer Marketing & Communications: Incremental non-labor expenses required to support expanded services in the areas of increased company-wide safety messaging and social media outlets (additional engagement and ad campaigns, production of additional video content, and enhance current social media software tools for metrics to track effectiveness of social media efforts).

2016	0	150	0	150	0.0	1-Sided Adj

Creative Services: Incremental non-labor expenses required to support development of hard-to-reach community media messages, traveling expenses, flyers, pamphlets, promotional material, and booth costs for regional/local events.

2016 Total	**814**	**1,440**	**0**	**2,254**	**9.0**	

Note: Totals may include rounding differences.

Area: CS - INFORMATION
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Category-Sub: 1. Customer Engagement & Insights
Workpaper: 2IN001.000 - CI-Customer Engagement & Insights

Determination of Adjusted-Recorded (Incurred Costs):

	2009 ($000)	2010 ($000)	2011 ($000)	2012 ($000)	2013 ($000)
Recorded (Nominal $)*					
Labor	464	1,054	1,498	1,393	1,331
Non-Labor	3,456	5,600	4,888	4,533	4,575
NSE	0	0	0	0	0
Total	**3,920**	**6,654**	**6,386**	**5,925**	**5,906**
FTE	5.0	12.3	18.1	15.5	14.7
Adjustments (Nominal $) **					
Labor	517	467	14	0	-8
Non-Labor	503	378	43	0	-198
NSE	0	0	0	0	0
Total	**1,020**	**845**	**57**	**0**	**-206**
FTE	6.1	4.9	0.1	0.0	-0.1
Recorded-Adjusted (Nominal $)					
Labor	981	1,520	1,512	1,393	1,323
Non-Labor	3,959	5,978	4,931	4,533	4,377
NSE	0	0	0	0	0
Total	**4,940**	**7,499**	**6,443**	**5,925**	**5,700**
FTE	11.1	17.2	18.2	15.5	14.6
Vacation & Sick (Nominal $)					
Labor	167	259	251	223	220
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**167**	**259**	**251**	**223**	**220**
FTE	2.0	3.1	3.1	2.6	2.5
Escalation to 2013$					
Labor	117	133	83	39	0
Non-Labor	427	483	196	80	0
NSE	0	0	0	0	0
Total	**545**	**615**	**280**	**119**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2013$)					
Labor	1,266	1,912	1,846	1,655	1,543
Non-Labor	4,386	6,461	5,127	4,612	4,377
NSE	0	0	0	0	0
Total	**5,651**	**8,373**	**6,973**	**6,267**	**5,919**
FTE	13.1	20.3	21.3	18.1	17.1

* After company-wide exclusions of Non-GRC costs
** Refer to "Detail of Adjustments to Recorded" page for line item adjustments
Note: Totals may include rounding differences.

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Workpaper: 2IN001.000 - CI-Customer Engagement & Insights

Summary of Adjustments to Recorded:

In Nominal $ (000) Incurred Costs					
Years	**2009**	**2010**	**2011**	**2012**	**2013**
Labor	517	467	14	0	-8
Non-Labor	503	378	43	0	-198
NSE	0	0	0	0	0
Total	**1,020**	**845**	**57**	**0**	**-206**
FTE	6.1	4.9	0.1	0.0	-0.1

Detail of Adjustments to Recorded:

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2009	59	0	0	0.8	CCTR Transf	From 2200-2060.000	CMAK20131026002724693

Cost alignment adjustment - Transfer web communications labor and FTE costs for 1 Market Advisor from CC 2200-2060 to CC 2200-2321 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)

2009	84	0	0	0.8	CCTR Transf	From 2200-2060.000	CMAK20131026002910987

Cost alignment adjustment - Transfer customer analytics labor and FTE costs for 1 Market Advisor from CC 2200-2060 to 2200-2076 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)

2009	0	341	0	0.0	CCTR Transf	From 2200-0422.000	CMAK20131027000046320

Cost alignment adjustment - Transfer "Track Mass Market 'Payment Options' " communications nonlabor activities from CC 2200-0422 to CC 2200-2143 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)

2009	203	121	0	2.8	CCTR Transf	From 2100-3166.000	CSCHRAMM20131107140850350

Transfer labor, FTE, and non-labor costs associated with SCG Cust Communication function from NSS cost center 2100-3166 in work paper group 1OO010 SDG&E Customer Communications & Research to SCG cost center 2200-2215 in work paper group 2IN001 SCG Customer Communications, Research & E-Services to align costs where function resides.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
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Category-Sub: 1. Customer Engagement & Insights
Workpaper: 2IN001.000 - CI-Customer Engagement & Insights

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2009	80	26	0	0.8	CCTR Transf	From 2100-3167.000	CSCHRAMM2013 1107142356347
Transfer labor, FTE, and non-labor costs associated with SCG Customer Communications Web function from NSS cost center 2100-3167 in work paper group 1OO010 SDG&E Customer Communications & Research to SCG cost center 2200-2321 in work paper group 2IN001 SCG Customer Communications, Research, & E-Services to align costs where function resides.							
2009	91	14	0	0.9	CCTR Transf	From 2100-3168.000	CSCHRAMM2013 1107143326533
Transfer labor, FTE, and non-labor costs associated with SCG Customer Communications Director function from NSS cost center 2100-3168 in work paper group 1OO010 SDG&E Customer Communications & Research to SCG cost center 2200-2215 in work paper group 2IN001 SCG Customer Communications, Research, & E-Services to align costs where function resides.							
2009 Total	**517**	**503**	**0**	**6.1**			
2010	0	329	0	0.0	CCTR Transf	From 2200-0422.000	CMAK201310251 52929000
Cost alignment adjustment - Transfer "Track Mass Market 'Payment Options' " communications nonlabor activities from CC 2200-0422 to CC 2200-2143 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)							
2010	24	0	0	0.2	CCTR Transf	From 2200-2060.000	CMAK201310251 62105103
Cost alignment adjustment - Transfer customer analytics labor and FTE costs for 1 Market Advisor from CC 2200-2060 to 2200-2076 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)							
2010	18	0	0	0.2	CCTR Transf	From 2200-2060.000	CMAK201310251 62933910
Cost alignment adjustment - Transfer web communications labor and FTE costs for 1 Market Advisor from CC 2200-2060 to CC 2200-2321 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)							
2010	299	26	0	3.4	CCTR Transf	From 2100-3166.000	CSCHRAMM2013 1107141052203
Transfer labor, FTE, and non-labor costs associated with SCG Cust Communication function from NSS cost center 2100-3166 in work paper group 1OO010 SDG&E Customer Communications & Research to SCG cost center 2200-2215 in work paper group 2IN001 SCG Customer Communications, Research & E-Services to align costs where function resides.							

Note: Totals may include rounding differences.

Area: CS - INFORMATION
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Workpaper: 2IN001.000 - CI-Customer Engagement & Insights

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2010	74	19	0	0.6	CCTR Transf	From 2100-3783.000	CSCHRAMM2013 1107141339123

Transfer labor, FTE, and non-labor costs assoicated with SCG Customer Communications Director function from NSS cost center 2100-3783 in work paper group 1OO010 SDG&E Customer Communications & Research to SCG cost center 2200-2215 in work paper group 2IN001 SCG Customer Communications, Research, & E-Services to align costs where function resides.

2010	14	0.994	0	0.1	CCTR Transf	From 2100-3167.000	CSCHRAMM2013 1107143136813

Transfer labor, FTE, and non-labor costs associated with SCG Customer Communications Web function from NSS cost center 2100-3167 in work paper group 1OO010 SDG&E Customer Communications & Research to SCG cost center 2200-2321 in work paper group 2IN001 SCG Customer Communications, Research, & E-Services to align costs where function resides.

2010	24	2	0	0.2	CCTR Transf	From 2100-3168.000	CSCHRAMM2013 1107143616713

Transfer labor, FTE, and non-labor costs associated with SCG Customer Communications E-Services function from NSS cost center 2100-3168 in work paper group 1OO010 SDG&E Customer Communications & Research to SCG cost center 2200-2143 in work paper group 2IN001 SCG Customer Communications, Research, & E-Services to align costs where function resides.

2010	14	0.469	0	0.2	CCTR Transf	From 2100-3785.000	CSCHRAMM2013 1108132301157

Transfer labor, FTE, and non-labor costs associated with SCG Customer Communications function from NSS cost center 2100-3783 in work paper group 1OO010 SDG&E Customer Communications & Research to SCG cost center 2200-2320 in work paper group 2IN001 SCG Customer Communications, Research, & E-Services to align costs where function resides.

2010 Total	**467**	**378**	**0**	**4.9**			
2011	0	43	0	0.0	CCTR Transf	From 2200-0422.000	CMAK201310251 51207510

Cost alignment adjustment - Transfer "Track Mass Market 'Payment Options' " communications nonlabor activities from CC 2200-0422 to CC 2200-2143 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)

2011	9	0.161	0	0.1	CCTR Transf	From 2100-3166.000	CSCHRAMM2013 1107141128757

Transfer labor, FTE, and non-labor costs associated with SCG Cust Communication function from NSS cost center 2100-3166 in work paper group 1OO010 SDG&E Customer Communications & Research to SCG cost center 2200-2215 in work paper group 2IN001 SCG Customer Communications, Research & E-Services to align costs where function resides.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Customer Engagement & Insights
Category-Sub: 1. Customer Engagement & Insights
Workpaper: 2IN001.000 - CI-Customer Engagement & Insights

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2011	6	0.061	0	0.0	CCTR Transf	From 2100-3783.000	CSCHRAMM2013 1107141556187
Transfer labor, FTE, and non-labor costs assoicated with SCG Customer Communications Director function from NSS cost center 2100-3783 in work paper group 1OO010 SDG&E Customer Communications & Research to SCG cost center 2200-2215 in work paper group 2IN001 SCG Customer Communications, Research, & E-Services to align costs where function resides.							
2011 Total	**14**	**43**	**0**	**0.1**			
2012 Total	**0**	**0**	**0**	**0.0**			
2013	0	-198	0	0.0	CCTR Transf	To 2200-2213.000	CMAK201402191 64022330
Cost alignment adjustment - Transfer costs related to Public Awareness to the responsible work group.							
2013	-8	0	0	-0.1	CCTR Transf	From 2200-0331.000	RMCHRIST20140 423132241267
Budget Planner Transfer in 2013.Transfer 2013 Budget Planner dollars from cost center 2200-2215 in work paper group 2IN001 to cost center 2200-0331 in work paper group 2OO006.							
2013 Total	**-8**	**-198**	**0**	**-0.1**			

Note: Totals may include rounding differences.

Supplemental Workpapers for Workpaper 2IN001.000

Supplemental Workpapers for Workpaper 2IN001

Footnote No. 21

California Public Utilities Commission

Policy and Planning Division

Customer as Grid Participants: A Fundamentally New Role for Customers

The entire document is available upon request.

California Public Utilities Commission

POLICY AND PLANNING DIVISION

Customers as Grid Participants: A Fundamentally New Role for Customers

Kristin Ralff Douglas
Principal Author
POLICY AND PLANNING DIVISION

Marzia Zafar
Director
POLICY AND PLANNING DIVISION

May 15, 2013

I. EXECUTIVE SUMMARY

The emission reduction goals called for in The Global Warming Solutions Act of 2006 (AB32) are challenging. The electricity sector's role in reaching those goals is paramount, as the state indicates that it is the largest potential source of viable emissions reductions. The California Public Utilities Commission (CPUC), along with its sister agencies under the leadership from the Governor and the legislature, have laid out a number of policy initiatives and programs to reduce greenhouse gases. These strategies include increasing the deployment of renewable powered distributed generation, promulgating electric cars, deploying smart meters, increasing the penetration of both commercial and residential energy efficiency and defining the market for Zero Net Energy homes.

Each of the above strategies is dependent on customer action. Customer participation, more than the actions of the utilities or of the regulators, is critical to meet California's greenhouse gas emission goals in a cost-effective manner.

Regardless of the underlying motivation, the customer's participation is critical to achieve these emissions reductions goals. Customer participation is the key; they have become an integral part of the power supply chain and of the grid itself. This is a paradigm shift from the historical view of utility consumers as merely ratepayers and passive recipients of electricity services to active participants in the power grid. In fact, this energy future represents a fundamental change in the relationship between the utility and the customer, increasing the onus on both to become partners.

Customer engagement is crucial to successful navigation of the paradigm shift. Getting customers engaged should be one of the primary goals of the utilities and the regulators. Engagement with the utilities and the third party service providers will expose customers to opportunities and tools to help them manage their energy usage for their optimal comfort and finances. To help understand the current level of engagement, this paper reviews three recent studies on customer segmentation that are relevant to the energy space.

Two primary actions that the utilities and regulators should consider are:

- Prioritize customer engagement through program designs and service offerings using analysis of customer needs and motivations.
- Expand the service offerings of the utility to include services that will facilitate and automate the customers' energy management opportunities.

Supplemental Workpapers for Workpaper 2IN001

Footnote No. 22

Chartwell, Inc.

Mobile: Trends and Opportunities 2013

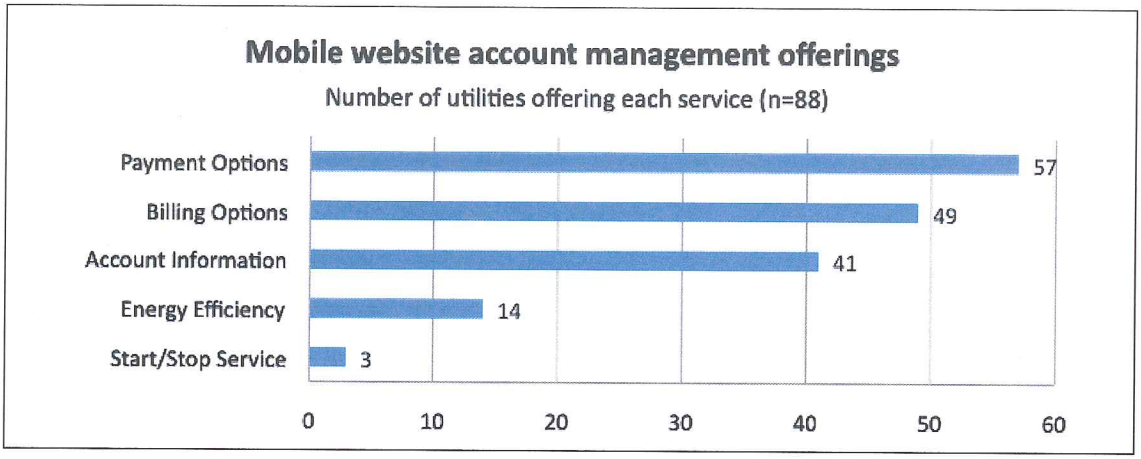
The entire document is available upon request.

Chartwell

Mobile:

TRENDS AND OPPORTUNITIES 2013

By: Will Adams, Research Analyst



More billing, payment services offerings via utility mobile-enhanced websites

In addition to leveraging outage information, utilities are becoming increasingly involved in the mobile space to allow customers to perform simple, self-service transactions. Taking a cue from other big industries – news, finance, banking, airlines and hotels – utilities increasingly are giving customers the ability to choose the frequency and capacity for sending, receiving and obtaining updates in the mobile space. Utility customers are comparing the functionality and services provided by their utility to those across other industries. Common features include accessing account information or submitting a bill payment.

According to Chartwell, 47% of utilities with a mobile-enhanced website allow customers to log in and access their account information. More than half offer billing options and 65% make some kind of payment option available for customers who wish to pay their bill via their utility's mobile website.

Supplemental Workpapers for Workpaper 2IN001

Footnote No. 26

Neilsen Pop-Facts

	A	B	C
1	2013 Population	19,764,278	100.00%
2	2013 Pop, Age 0 - 4	1,375,925	6.96%
3	2013 Pop, Age 5 - 9	1,334,811	6.75%
4	2013 Pop, Age 10 - 14	1,371,822	6.94%
5	2013 Pop, Age 15 - 17	879,354	4.45%
6	2013 Pop, Age 18 - 20	918,898	4.65%
7	2013 Pop, Age 21 - 24	1,187,345	6.01%
8	2013 Pop, Age 25 - 34	2,824,911	14.29%
9	2013 Pop, Age 35 - 44	2,709,782	13.71%
10	2013 Pop, Age 45 - 54	2,712,224	13.72%
11	2013 Pop, Age 55 - 64	2,160,150	10.93%
12	2013 Pop, Age 65 - 74	1,284,837	6.50%
13	2013 Pop, Age 75 - 84	695,438	3.52%
14	2013 Pop, Age 85+	308,781	1.56%
15			
16	2013 Pop, Age 18 to 44	7,640,936	**38.66%**
17		sum of cell B6 to B9	sum of cell C6 to C9
18			
19			
20	Source:	Nielsen Pop Facts	
21	Area	SCG Territory	

Supplemental Workpapers for Workpaper 2IN001

Footnote No. 27

Pew Research Center

Social Media Update 2013

The entire document is available upon request.

PewResearchCenter

NUMBERS, FACTS AND TRENDS SHAPING THE WORLD

FOR RELEASE DECEMBER 30, 2013

Social Media Update 2013

42% of online adults use multiple social networking sites, but Facebook remains the platform of choice

Maeve Duggan, Research Assistant
Aaron Smith, Senior Researcher
202.419.4500
www.pewresearch.org

RECOMMENDED CITATION: Maeve Duggan and Aaron Smith, Pew Research Center, January 2014, "Social Media Update 2013"
Available at: http://pewinternet.org/Reports/2013/Social-Media-Update.aspx

Demographics of key social networking platforms

Fully 71% of online adults now use Facebook, and usage among seniors has increased significantly in the last year. Some 45% of internet users age 65 or older now use Facebook, up from 35% who did so in late 2012. Women are also particularly likely to use Facebook compared with men.

Facebook users

Among online adults, the % who use Facebook

	Use Facebook
All internet users (n= 1,445)	*71%*
a Men (n= 734)	66
b Women (n= 711)	76[a]
a White, Non-Hispanic (n= 1,025)	71
b Black, Non-Hispanic (n= 138)	76
c Hispanic (n= 169)	73
a 18-29 (n= 267)	84[cd]
b 30-49 (n= 473)	79[cd]
c 50-64 (n= 401)	60[d]
d 65+ (n= 278)	45
a High school grad or less (n= 385)	71
b Some college (n= 433)	75[c]
c College+ (n= 619)	68
a Less than $30,000/yr (n= 328)	76[d]
b $30,000-$49,999 (n= 259)	76
c $50,000-$74,999 (n= 187)	68
d $75,000+ (n= 486)	69
a Urban (n= 479)	75
b Suburban (n= 700)	69
c Rural (n= 266)	71

Pew Research Center's Internet Project August Tracking Survey, August 07 –September 16, 2013. N=1,445 internet users ages 18+. Interviews were conducted in English and Spanish and on landline and cell phones. The margin of error for results based on all internet users is +/- 2.9 percentage points.
Note: Percentages marked with a superscript letter (e.g., [a]) indicate a statistically significant difference between that row and the row designated by that superscript letter, among categories of each demographic characteristic (e.g., age).

PEW RESEARCH CENTER

Supplemental Workpapers for Workpaper 2IN001

Footnote No. 28

Chartwell, Inc.

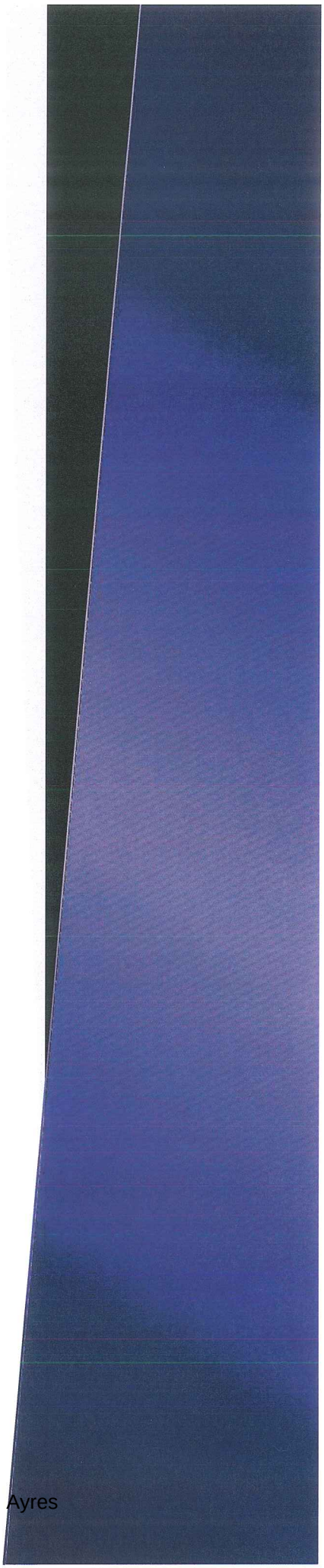
Social Media 2013

The entire document is available upon request.

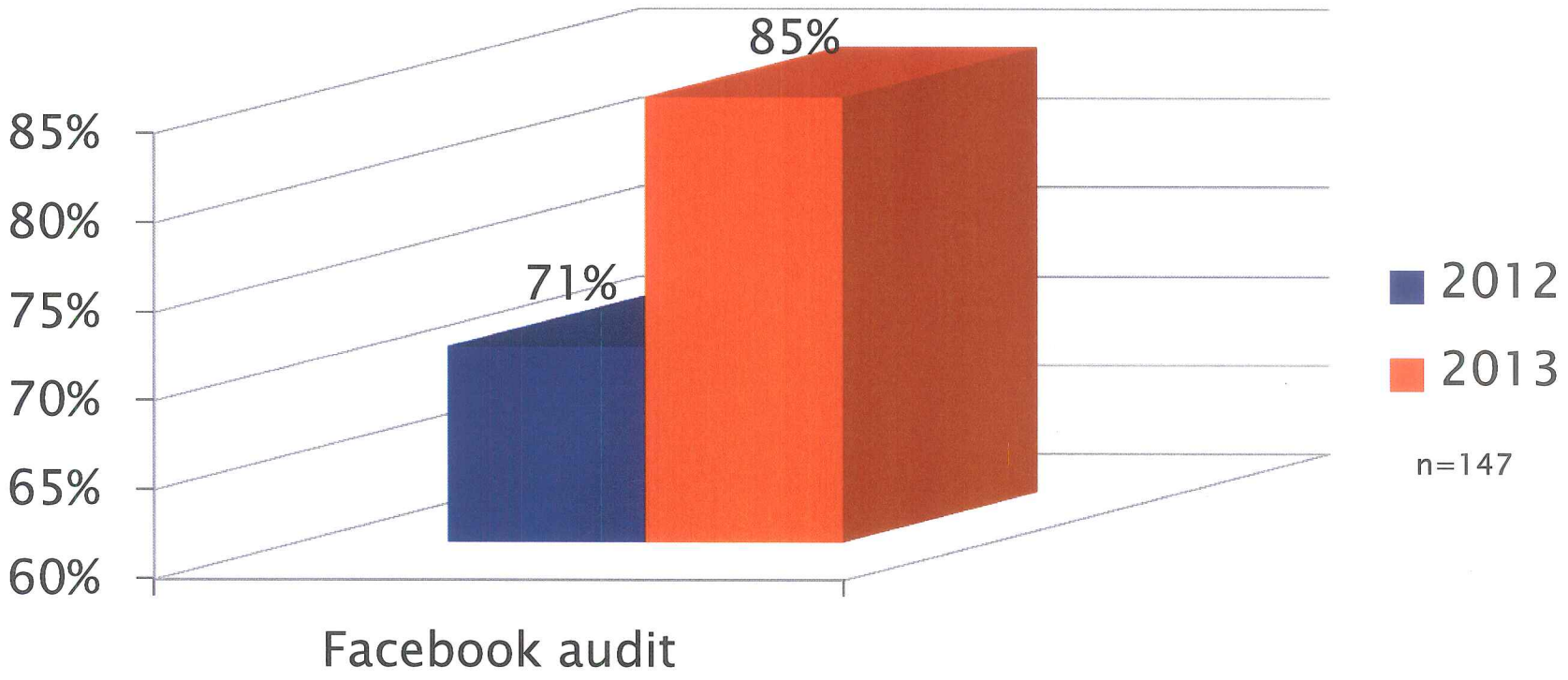
Social Media 2013

Chartwell Inc.

Aug. 29, 2013



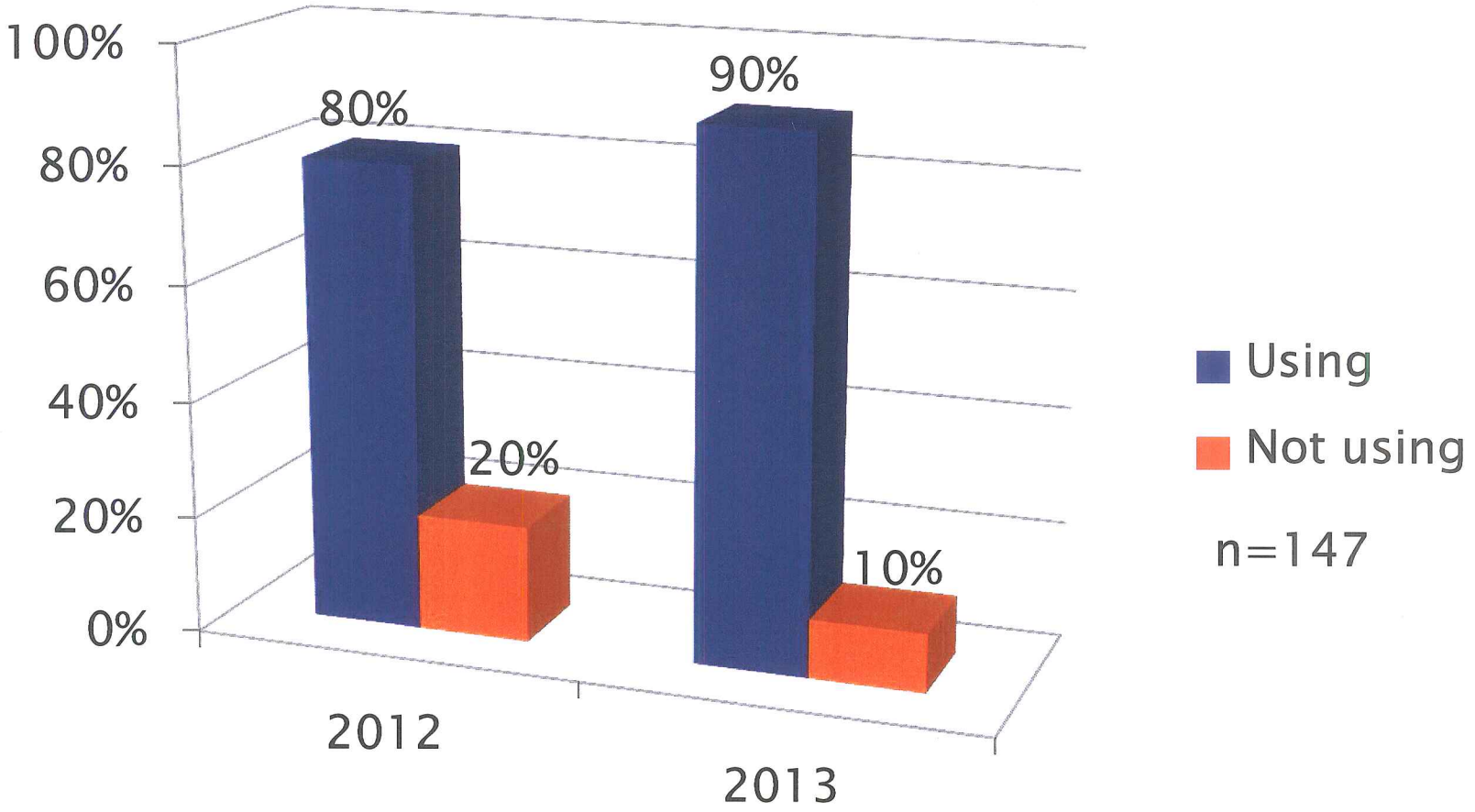
Utilities on Facebook



Chartwell Inc., 2013

CELEBRATING 20 YEARS Chartwell

Utilities using Twitter



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Footnote No. 30

Chartwell, Inc.

Former Facebook exec advises utilities on social media at DistribuTECH 2014

Highlights from AESP's national conference →

Former Facebook exec advises utilities on social media at DistribuTECH 2014

January 30, 2014
By Russ Henderson, Senior Research Analyst —

In her keynote address Tuesday morning, Randi Zuckerberg kicked off DistribuTECH 2014 with a list of social media trends that utilities should take advantage of.

A few examples:

The new loyalty program of today.

"Turn your fans into instant celebrities," Zuckerberg said. She said a good example is Sydney's new 1888 Hotel, which offers free stays to guests with more than 10,000 followers on Instagram. Yes, the utility industry's regulatory structure in most places doesn't provide a lot of consumer choice, but thinking of ways to make popular people like you may not be a bad idea.

The new customer service.

In our increasingly connected world, good news travels fast, but bad news travels even faster. Zuckerberg said a movie executive told her once that Facebook and other social media had ruined the movie industry – before, even a bad movie would get at least two good weekends at the theater. Now, a bad movie is dead on opening night.

Customers are connected, and they talk to one another about their experiences. Their customer service expectations are set by other industries, and the utility industry has to adapt to that reality. Chartwell will be hosting a webinar on social customer service Feb. 5.

Think like a media company.

Red Bull has made the transition from mere energy drink to online extreme sports event producer by thinking like a media company, not just a beverage company. Zuckerberg said utilities need to produce more content for social media, things that are intended to "go viral." She suggested having line crews spend a day wearing Google Glass and recording it all on video.

We've recently seen utilities make some forays into social media. Puget Sound Energy's Re-Energized by Design home-makeover style contest featured six households' energy efficiency progress. Online videos and blogs showcased the competition's progress and generated excitement about the utility's energy efficiency programs and rebate opportunities. Chartwell gave the ground-breaking program our Gold Marketing Award in October at EMACS 2013: The Customer Experience Conference.

Gamification for motivation.

Anything can be made into a game. There's now an alarm clock, for example, that donates your money to charity every time you hit snooze. There are a number of examples of gamification in the utility industry, of course. Zuckerberg pointed out Xcel Energy's Bulb Blasters.

Zuckerberg may not be a utility industry expert, but she certainly knows what she's talking about when it comes to social media. She was one of the early employees of Facebook, co-founded by her brother Mark. She created and ran much of Facebook's marketing programs, she ran the company's political coverage and in 2011 was nominated for an Emmy for her coverage of the 2010 mid-term elections. You can read more about Randi in other places, including the website of her new company, Zuckerberg Media.

LATEST BLOGS

April 9, 2014:
LADWP plans to improve customer experience of solar incentive program... »

April 7, 2014:
Senior utility customers prove online versatility... »

April 2, 2014:
Takeaways from Chartwell's Marketing Energy Efficiency Programs Summit... »

Supplemental Workpapers for Workpaper 2IN001

Footnote No. 33

Centers for Disease Control and Prevention's (CDC) National Center for Health Statistic (NCHS)

Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, July – December 2012

The entire document is available upon request.

Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, July–December 2012

by Stephen J. Blumberg, Ph.D., and Julian V. Luke
Division of Health Interview Statistics, National Center for Health Statistics

Overview

Preliminary results from the July–December 2012 National Health Interview Survey (NHIS) indicate that the number of American homes with only wireless telephones continues to grow. Nearly two in every five American homes (38.2%) had only wireless telephones (also known as cellular telephones, cell phones, or mobile phones) during the second half of 2012—an increase of 2.4 percentage points since the first half of 2012. In addition, nearly one of every six American homes (15.9%) received all or almost all calls on wireless telephones despite also having a landline telephone. This report presents the most up-to-date estimates available from the federal government concerning the size and characteristics of these populations.

NHIS Early Release Program

This report is published as part of the NHIS Early Release Program. Twice each year, the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS) releases selected estimates of telephone coverage for the civilian noninstitutionalized U.S. population based on data from NHIS, along with comparable estimates from NHIS for the previous 3 years. The estimates are based on in-person interviews that NHIS conducts continuously throughout the year to collect information on health status, health-related behaviors, and health care access and utilization. The survey also includes information about household telephones and whether anyone in the household has a wireless telephone.

Two additional reports are published regularly as part of the NHIS Early Release Program. *Early Release of Selected Estimates Based on Data From the National Health Interview Survey* is published quarterly and provides estimates for 15 selected measures of health. *Health Insurance Coverage: Early Release of Estimates From the National Health Interview Survey* is also published quarterly and provides additional estimates regarding health insurance coverage. Other Early Release Program products are released as needed.

Methods

For many years, NHIS has asked respondents to provide residential telephone numbers, to permit the recontacting of survey participants. Starting in 2003, additional questions were asked to determine whether a family had a landline telephone. NHIS families were considered to have landline telephone service if the survey respondent for each family reported that there was "at least one phone inside your home that is currently working and is not a cell phone." (To avoid possible confusion with cordless landline telephones, the word "wireless" was not used in the survey.)

An NHIS "family" can be an individual or a group of two or more related persons living together in the same housing unit (a "household"). Thus, a family can consist of only one person, and more than one family can live in a household (including, for example, a household where there are multiple single-person families, as when unrelated roommates are living together).

The survey respondent for each family was also asked whether "anyone in your family has a working cellular telephone." Families are identified as

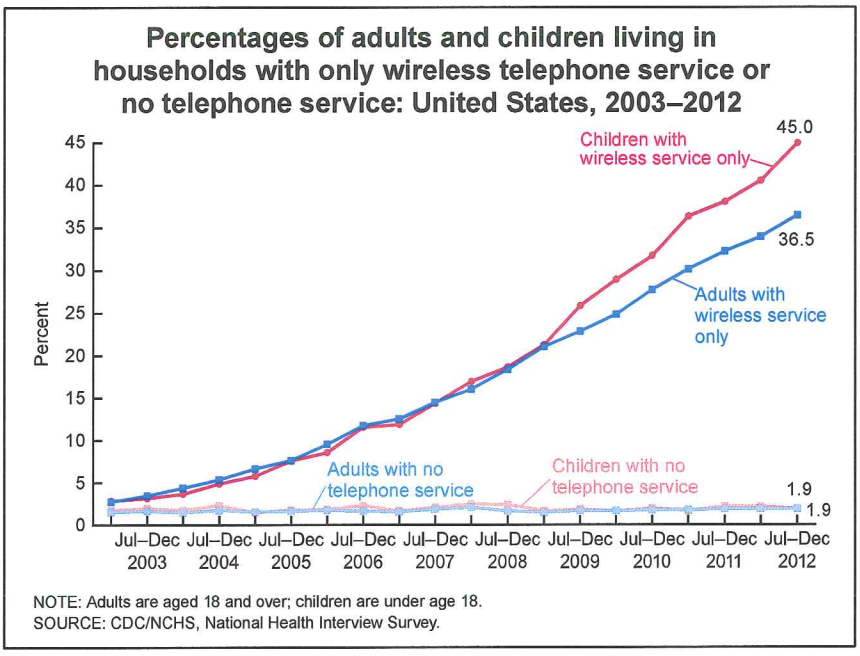


Figure 1

Supplemental Workpapers for Workpaper 2IN001

Footnote No. 36 & 37

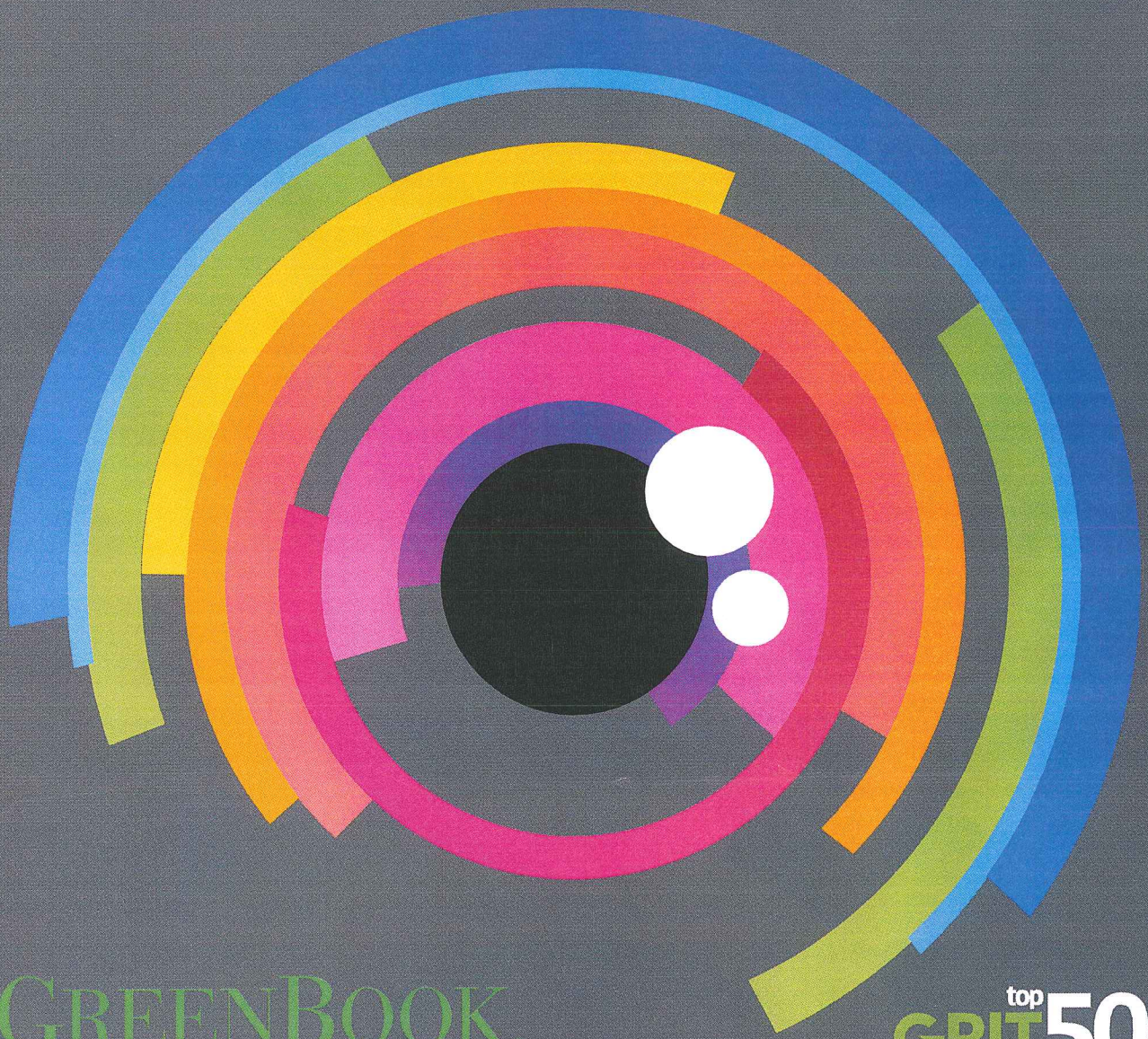
GreenBook

GreenBook Research Industry Trends Report, Spring 2012

The entire document is available upon request.

Spring 2012

GreenBook GRIT
Research Industry Trends Report



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MRGA
The Research Club
New MR
ARF Advertising Research Foundation
aytm ask your target market
MarketTools.
itracks
infosurv
MRIA XRIM
Research Rockstar
Brand3Sixty
decooda intelligent market insights
Q research software

Emerging techniques being used today

Before looking at where things are going, it is useful to review where we are today in terms of new market research, something which is increasingly referred to as "New MR."

As in all fields, there are early adopters and then there are laggards among the GRIT sample. For example, about 30% of research clients/buyers and vendors said they were not using any of the listed techniques—a selection of 17 of the hottest approaches in market research, stretching from gamification, through prediction markets, to online communities.

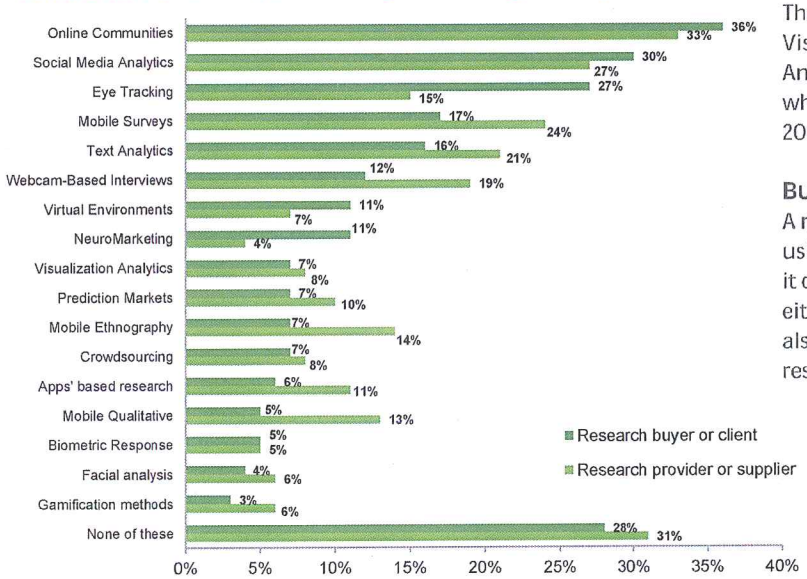
We can broadly divide the newer techniques into four bands, those being used by more than 30% of companies, those used by 20-29%, those used by 10% to 19%, and those which have not taken off yet or may never take off (i.e., those attracting mentions by fewer than 10% of companies).

Over 30% utilization

Only one of the listed techniques scores higher than 30% with both clients/buyers (36%) and vendors (33%), and that is online communities. Online communities have become almost ubiquitous on conference agendas, suggesting they are becoming a mainstream approach.

Social Media Analysis is the second most frequently mentioned technique, with clients/buyers mentioning it 30% of the time and vendors 27%. In the future, it might be interesting to measure how often these projects use free versus commercial tools; also, how much should be considered "market research" and how much competitive intelligence, marketing, or other non-MR descriptions.

What MR techniques are you using today?



Note: Among research buyers (n=149) and research suppliers (n=669).

20% to 29%

The band 20 to 29% shows some marked differences between the percentages of vendors and clients/buyers mentioning techniques. For example, eye tracking is mentioned by 27% of research clients/buyers and only 15% of research vendors. An explanation might be that eye tracking tends to be offered by specialist agencies, or perhaps that non-MR companies are major players in providing eye tracking.

Mobile surveys and text analysis turn the pattern around. Mobile surveys are mentioned by 24% of vendors and 17% of clients/buyers, whilst Text Analytics are mentioned by 21% of vendors and 15% of clients/buyers.

10% to 19%

In the band 10% to 19% there are several other approaches more in use by vendors than by clients/buyers, perhaps reflecting a push by suppliers/providers rather than a pull buy clients/buyers. This group includes Webcam based Interviews, Prediction Markets, Mobile Ethnography, Mobile Qualitative, and Apps based Research.

Just two methods at the bottom of this band had more buyer than vendor usage—Virtual Environments and Neuromarketing.

Less than 10%

The wooden spoon group includes Crowdsourcing, Visualization Analytics, Biometric Responses, Facial Analysis and Gamification. This raises the question whether they were getting ready to break through in 2011 or are destined to be niche.

Buyer Pull Versus Vendor Push

A mismatch between the number of clients/buyers using a technique and the number of vendors selling it can suggest that the technique is more subject either to vendor push or buyer pull. But it could also relate to competitors from outside of market research and specialized skills.

Will Mobile Reach the Tipping Point?

A big climber, from actual 2011 to expected 2012, is Mobile Surveys, with clients/buyers jumping from a current 17% to an expected 53% and vendors expecting the increase to be from 24% to 64%. Does this mean that Mobile Surveys are about to take off?

If the figures in this report relate to the estimated 10% of regular online surveys that are being completed on mobile devices, this might prove to be true. If the figures relate to specifically designed and fielded mobile surveys the outcome might be different.

One interesting anecdote that might shed light on this issue: in a recent conversation a senior leader at a global research provider stated that within their organizations they billed well over $100M for mobile-based projects last year. Due, however, to legacy accounting system issues, most of these projects were assigned to CAWI or CAPI codes. They suspect that many large full service firms are struggling with issues like this, resulting in under-reporting the usage of mobile as a research platform. Many of the firms providing mobile research services are technology providers or sample companies that are not asked to contribute data to broad industry reports. Further, newer companies emerging into the space are not members of any trade organizations that track revenue by method. Given all these factors, it is highly likely that the contribution of mobile research to global market research spend is far higher than has been reported.

In the GRIT study we have chosen to measure modality use by share of projects rather than share of revenue, and this may explain why GRIT is shows relatively high usage of a discrete mode while other industry studies are reporting far lower indicators.

It is also possible that legacy accounting and delivery by firms not surveyed as market research providers may also be causing social media and text analytics to be under reported. Their actual usage and contribution to revenue may be significantly higher than current data show.

If this dynamic applies, it would support the bullish attitude that GRIT respondents have towards the growth of mobile.

Buyer Pull

The only method showing more clients/buyers than providers is eye tracking, which mirrors the split in the current figures. Eye Tracking stands out as consistently having a different pattern of supply and demand.

> A big climber is Mobile Surveys, with clients/buyers jumping from a current 17% to an expected 53% and vendors expecting the increase to be from 24% to 64%

Vendor Push

Approaches that clearly show more utilization by vendors than by clients/buyers in 2012 include methods generally considered innovative: Mobile Surveys, Webcam based Interviews, Apps based research, Mobile Qual, Mobile Ethnography, Crowdsourcing, Visualization Analytics, Prediction Markets, and Gamification. Vendor push of these modes is consistent with the drive to create operational and cost efficiencies as key competitive differentiators among suppliers/providers. In other words, vendors remain focused on the "How", while clients are more interested in the "Why". Focusing on the shape of the overall market should not hide the fact that specific clients/buyers will also be driving the process by demanding innovation and change.

> Vendors remain focused on the "How", while clients are more interested in the "Why"

The Dark Horse and the Wooden Spoons

Text Analytics is fourth in the table of approaches expected to be used in 2012 and is strongly favored by both vendors and clients/buyers. This may be one to watch.

The approaches that emerge as niches for both clients/buyers and vendors are Biometric Response, Neuromarketing, and Facial Analysis.

Supplemental Workpapers for Workpaper 2IN001

Footnote No. 39 & 40

E Source

Focus Report RES F-43

Multicultural Marketing and Outreach: How Engaging Key Ethnicities Will Grow Utility Program Participation

The entire document is available upon request.

E Source

Focus Report | RES-F-43 | Published: June 6, 2012

Multicultural Marketing and Outreach

How Engaging Key Ethnicities Will Grow Utility Program Participation

By Paula Aven Gladych, Chris Connolly

Contents

Executive Summary

Think you know who your typical customer is in your service territory? Consider thinking again, because ethnic and cultural diversity in North America continues to grow at a rapid pace. Utilities and other service organizations are taking a closer look at demographic trends related to ethnicity. Companies that want to be successful in increasingly diverse markets must craft different messages that resonate with multicultural customers, use different channels that reach those customers, and touch different emotional buttons that may be unique to specific ethnic groups.

The 2002 E Source report Buying Power: Marketing Energy Services to an Ethnically Diverse Customer Base (PDF) encouraged utilities to start developing in-depth multicultural marketing programs to reach minority groups and effectively grow awareness of and participation in utility programs. In 2012, as diversity continues to grow, the reasons for taking on the multicultural marketing challenge are even more compelling. The 2010 U.S. Census shows that although the non-Hispanic white population is still the largest racial and ethnic group, it's growing at the slowest rate. Conversely, Asian, black, and Hispanic (who, according to the U.S. Census Bureau, identify with Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race) populations are growing at a faster rate. In many locations across the continent, multicultural is the new normal.

Utilities can increase customer engagement with these rapidly growing groups by taking a closer look at the groups' demographics and identifying key ethnicities within the territories. Then utilities can prioritize which of the largest ethnic groups they should target with a multicultural marketing and outreach strategy. By developing campaigns that generate awareness through in-language messaging and the use of ethnic media channels, utilities can make significant inroads with their ethnic customer base.

In addition to translating key messages into multiple languages and incorporating cultural nuances into their communications, utilities need to also establish a recognizable and trusted presence in ethnic communities. Face-to-face interaction with ethnically diverse customers is often critical to those customers' understanding of what utilities have to offer, and our research shows that these efforts to cultivate relationships and create awareness can pay off. E Source leveraged The Nielsen Company's survey of more than 30,000 residential customers in the U.S. and learned that when customers of ethnically diverse backgrounds become aware of utility energy-efficiency offerings, they have a higher participation rate than nonethnic customers do.

Some utilities discussed in this report have progressively customized and adapted their business-as-usual offerings in multiple marketing areas to enhance their ethnic customer participation. These cases exemplify how utilities have used multicultural outreach and marketing to deepen existing relationships with some customers, and to cultivate new relationships with others. Through effective multicultural outreach and communications efforts, utilities can increase trust and loyalty with more of their ethnic customer base, while helping these groups save money and energy in the process.

Full Report

INCREASE PROGRAM PARTICIPATION THROUGH MULTICULTURAL MARKETING

Innovative technologies and social media have made it even easier for energy service providers to reach new, diverse, and growing audiences.

As the cultural demographics of the United States and Canada continue to evolve, it has become even more important for utilities to find innovative ways to reach multicultural customers. The 2002 E Source report, Buying Power: Marketing Energy Services to an Ethnically Diverse Customer Base (PDF), found that multicultural marketing fosters deeper and longer-lasting customer relationships and is essential if utilities want to retain existing customers and acquire new ones. Energy providers that customized their marketing initiatives to focus on specific ethnic groups significantly raised their response rates among those targeted groups. They also built goodwill and stronger customer loyalty, making it more likely that ethnically diverse customers who responded to targeted marketing would also pay their bills on time and participate in future energy-efficiency programs.

After you've successfully worked with one group, you can extend your engagement to other ethnic communities with some intermediate steps. It's important to remember that each group will have linguistic, cultural, and value differences that require ground-floor market research, but you can begin your outreach by cultivating a mainstream ethnic media outlet to assist with your messaging. Next, reach out to the subgroups within the dominant ethnic groups and provide language translations on utility bills. Finally, begin to market your energy conservation campaigns.

As you move toward a mature multicultural marketing program, you can develop more-comprehensive in-language and in-culture communications for multiple groups. Leverage multiple channels and culturally customized customer service to achieve full tactical engagement. Then, begin to introduce your environmental impact messaging.

It takes time to put a progressive multicultural marketing plan in place, and it takes even more time to build the loyalty, trust, and goodwill with your customers that are necessary for a mature multicultural marketing approach. However, as established in this research, ethnic groups are ready to take action and participate in your programs. They just need to see you in their communities, hear your messages in the right languages, and understand and trust the opportunities and value you offer them.

REAPING THE BENEFITS OF DEEPER RELATIONSHIPS WITH ETHNIC CUSTOMERS

Using demographics and segmentation, utility marketers can identify and target ethnic groups. But a deeper understanding of local ethnic communities and their values is required to engage these customers with appropriate messages, and to build relationships with ethnic communities that pay big dividends.

Successful multicultural marketing requires relationship building to generate results. By learning about their customers, speaking their language, attending community events, and establishing a trusted presence within the community, utilities can pave the way for deeper connections with multicultural customers. Utilities have strong growth opportunities for their efficiency programs among ethnic subgroups because awareness of these programs is often low—yet interest in participation is high.

Companies with a mature multicultural marketing program are likely to target multiple ethnic segments with fully translated materials across all marketing channels. They'll have cultural ambassadors spreading utility program messaging through word-of-mouth and at community events. Their messaging strategy will include both more-basic messages about safety and rate concerns, and more-specialized energy conservation and environmental impact campaigns. And they'll reap the many benefits of a more comprehensive marketing and communications presence.

Those companies that are willing to surmount the hurdles of language and culture will find that these efforts of making messages meaningful and relevant in the minds of of ethnic customers will do more

than encourage program participation. Forging relationships with ethnic communities can also lower acquisition costs, reduce churn, increase customer commitment, and position the utility as a caring community participant—a positive identity that can earn both ethnic and mainstream customers' loyalty.

RESOURCES

Overview of Race and Hispanic Origin: 2010 (PDF), U.S. Department of Commerce (2010)

Top Tips for Multicultural Marketing, MarketingProfs (2011)

Ethnocultural Portrait of Canada Highlight Tables, 2006 Census, Statistics Canada, Statistics Canada (2006)

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7 Joe Cunningham (October 2011), Market Research Manager, Duke Energy, 7043829043, joe.cunningham@duke-energy.com.

8 Ingrid White (August 2011), Program Manager, DTE Energy, 3132358953, whitei@dteenergy.com.

9 Fouad Ashkar (April 2012), Ethnic Marketing Manager, DTE Energy, 313-235-8480, ashkarf@dteenergy.com.

Supplemental Workpapers for Workpaper 2IN001

Footnote No. 41

Brand Strategy Insider

Establishing A 'Branded Language'

BRAND STORYTELLING **Provoking Reaction Through Brand Storytelling**

BRANDING IDEAS JULY 28TH, 2008

Establishing A 'Branded Language'

by Martin Lindstrom

Disney, Kellogg's, and Gillette are three completely different brands with one commonality. Over the past decade, they've established a branded language, whether they know it or not. In my latest book, we found 74 percent of today's consumers associate the word "crunch" with Kellogg's. Another 59 percent consider the word "masculine" and Gillette as one and the same. Americans formed the strongest association of masculinity to Gillette, by an astounding 84 percent.

Disney scored higher in purloined language than any other brand. This brand welcomes you to its kingdom of fantasy, dreams, promises, and magic. If you've stayed at a Disney resort, taken a Disney cruise, or eaten in a Disney restaurant, it doesn't take long to hear "cast members" greeting guests with, "Have a magical day!"

For over half a century, Disney has consistently built its brand on a foundation much larger than its logo. A substantial chunk relies on songs and voiceovers that almost always include Disney-branded words. Associating words with brands comes at no extra cost. Disney's manages to "own" six of them: "dreams," "creativity, "fantasy," "smiles," "magic," and "generation."

Our BRAND sense study shows over 80 percent of the world's population directly associates these generic words with Disney.

The keywords are repeated over and over in Disney's advertising copy, song lyrics, and story lines and on Disney Channel. The words cross all media channels, from TV to the Internet, with ease and fluidity. No opportunity is wasted in making strong connections between Disney and "magic," Disney and "fantasy," Disney and "dreams," and so on.

What's more, Disney's language survives what I call the smash test. Pick a word, sentence, or column from any Disney publication, remove each brand reference, and — voilà! — The brand's still recognizable.

To create a truly smashable brand requires consistency and patience. This is difficult, in a corporate world where the only constant is ever changing branding strategies and CMOs. Add to this a fluctuating financial market that demands instant results, and the brand message becomes just another bit of brand information in an overcrowded field. With annual reports, TV commercials, and Web sites often handled by different divisions, you loose any opportunity for language synergy.

It takes years for words, phrases, and sentences to be identified and accepted as belonging to specific brands.

The first step to integrate specific language into your brand is to identify the words you want to own. Select

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them based on those words that best reflect your brand's personality. Choose words that are easy to integrate in many different kinds of sentences and are the most flexible.

There's no mistaking Absolut Vodka's language. Its "Absolut Home" page lets you jump to "Absolut Reality," "Absolut Pictures," "Absolut Generations," and other "Absolut" destinations. Should you wish to contact the company, go to "Absolut Contact." Everything on the site is consistent with Absolut's advertising campaign, which has been running for over 20 years. The campaign's based on continuity and variety; 1,400 ads have been produced since 1980, all related to the original vision that launched Absolut Perfection.

The key to forming a smashable language is to integrate it into every piece of communication your company is responsible for, including all internal communications.

Evaluate your branded language, and determine the words you would like to own. It costs nothing and might lead to free advertising in your national dictionary.

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Supplemental Workpapers for Workpaper 2IN001

Footnote No. 42

Nielsen Norman Group

How Long Do Users Stay on Web Pages?

How Long Do Users Stay on Web Pages?

by JAKOB NIELSEN on September 12, 2011

Topics: Human Computer Interaction Web Usability

Summary: Users often leave Web pages in 10-20 seconds, but pages with a clear value proposition can hold people's attention for much longer because visit-durations follow a negative Weibull distribution.

How long will users stay on a Web page before leaving? It's a perennial question, yet the answer has always been the same:

- *Not very long.*

The average page visit lasts a little less than a minute.

As users rush through Web pages, they have time to read only a quarter of the text on the pages they actually visit (let alone all those they don't). So, unless your writing is extraordinarily clear and focused, little of what you say on your website will get through to customers.

However, while users are always in a hurry on the Web, the time they spend on individual page visits varies widely: sometimes people bounce away immediately, other times they linger for far longer than a minute. Given this, **the average is not the most fruitful way of analyzing** user behaviors. Users are human beings — their behaviors are highly variable and are not captured fully by a single number.

Leaving Web Pages: The Weibull Hazard Function

New research by Chao Liu and colleagues from Microsoft Research now provides a mathematical understanding of users' page-leaving behaviors. The scientists collected data from "a popular Web browser plug-in," analyzing page-visit durations for **205,873 different Web pages** for which they had captured upwards of **10,000 visits.** Suffice it to say: these guys crunched *a lot* of data (more than 2 billion dwell times).

- The result: **the time users spend on a Web page follows a Weibull distribution**.

99.9% of readers will now ask: *What's a Weibull distribution?*

Weibull is a reliability-engineering concept that's used to analyze the time-to-failure for components. The model's *hazard function* indicates the probability that a component will fail at time *t*, given that it has worked fine up until time *t*.

So, after replacing a spare part in a piece of equipment, Weibull analysis predicts when you'll have to replace it again. It also lets you conduct risk analysis beyond simplistic mean-time to failure. And, if you own a lot of equipment, you can use aggregate analysis to, say, manage your spare-parts inventory.

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Of course, when analyzing Web visits, we simply replace "component failure" with "user leaving the page." In their research paper, Liu and colleagues provide intensive statistical analysis to show that the Weibull model closely matches users' empirically observed behavior.

According to earlier research, there are 2 different kinds of Weibull distributions:

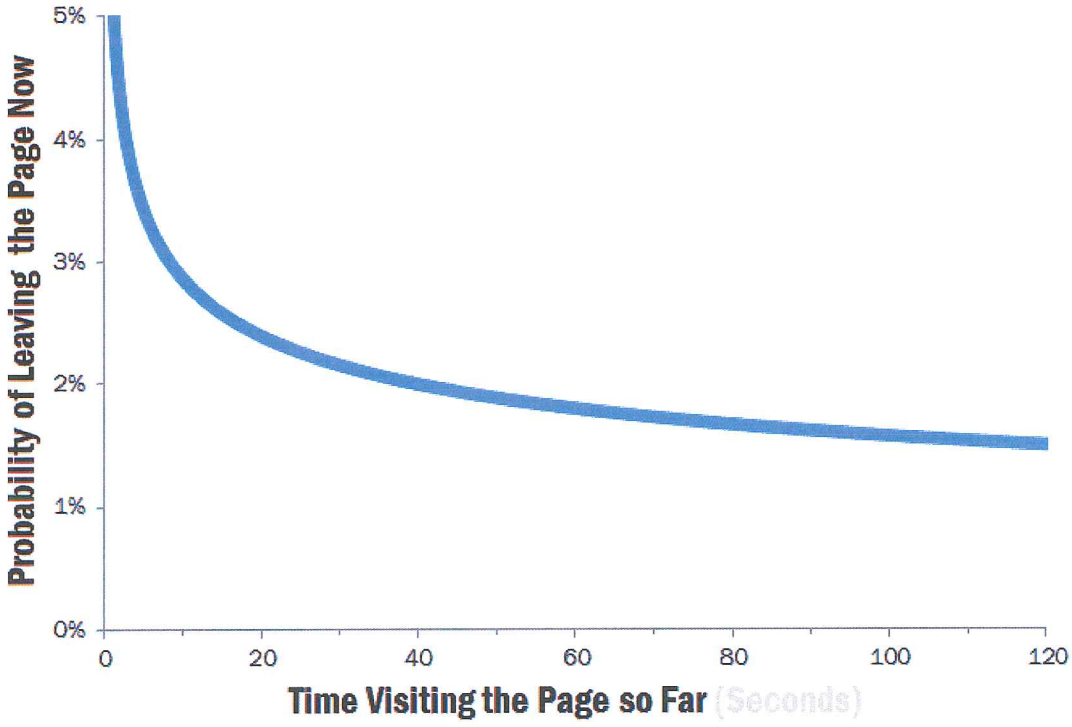
- **Positive aging**: The longer the component has been in service, the **more likely** it is to fail. In other words, the hazard function increases for larger values of *t*. This makes intuitive sense, because the longer stuff is used, the more it wears down. Thus, something that has been in use for a long time will be approaching its breaking point.
- **Negative aging**: The longer the component has been in service, the **less likely** it is to fail. Here, the hazard function decreases for larger values of *t*. This makes sense when individual components vary in quality: poorly made components usually fail early, so anything that has been in service for a long time is likely to be particularly robust and will usually survive even longer.

Negative Aging: Leave Quick or Stay Long

The researchers discovered **that 99% of Web pages have a negative aging effect**. In human–computer interaction (HCI) research, it's extremely rare to get this strong a finding, and Liu and colleagues should be credited with discovering a major new insight.

Why negative aging? Because Web pages are indeed of highly variable quality. Users know this and spend their initial time on a page in ruthless triage to abandon the dross ASAP. It's rare for people to linger on Web pages, but when users do decide that a page is valuable, they may stay for a bit.

The following chart shows the hazard function — that is, the likelihood of leaving — for the median Weibull parameters fitted across the scientists' humongous dataset:



It's clear from the chart that the **first 10 seconds of the page visit are critical** for users' decision to stay or leave. The probability of leaving is very high during these first few seconds because users are extremely skeptical, having suffered countless poorly

designed Web pages in the past. People know that most Web pages are useless, and they behave accordingly to avoid wasting more time than absolutely necessary on bad pages.

If the Web page survives this first — extremely harsh — 10-second judgment, users will look around a bit. However, they're still highly likely to leave during the subsequent 20 seconds of their visit. Only after people have stayed on a page for about 30 seconds does the curve become relatively flat. People continue to leave every second, but at a much slower rate than during the first 30 seconds.

So, if you can convince users to stay on your page for half a minute, there's a fair chance that they'll stay much longer — often 2 minutes or more, which is an eternity on the Web.

So, roughly speaking, there are two cases here:

- **bad pages**, which get the chop in a few seconds; and
- **good pages**, which might be allocated a few minutes.

Note: **"good" vs. "bad" is a decision that each individual user makes** within those first few seconds of arriving. The design implications are clear:

- To gain several minutes of user attention, you must clearly **communicate your value proposition within 10 seconds**.

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Supplemental Workpapers for Workpaper 2IN001

Footnote No. 43, 44, 45 & 46

Pew Research Center

Cell Phone Use 2013

The entire document is available upon request.

PewResearchCenter
www.pewresearch.org

SEPTEMBER 16, 2013

Cell Internet Use 2013

57% of American adults use their cell phone to go online. And 21% of cell phone owners say they mostly access the internet using their phone.

Maeve Duggan
Research Assistant, Pew Internet Project

Aaron Smith
Senior Researcher, Pew Internet Project

http://pewinternet.org/Reports/2013/Cell-Internet.aspx

FOR FURTHER INFORMATION, CONTACT:

Pew Research Center's Internet & American Life Project
1615 L St., N.W., Suite 700
Washington, D.C. 20036

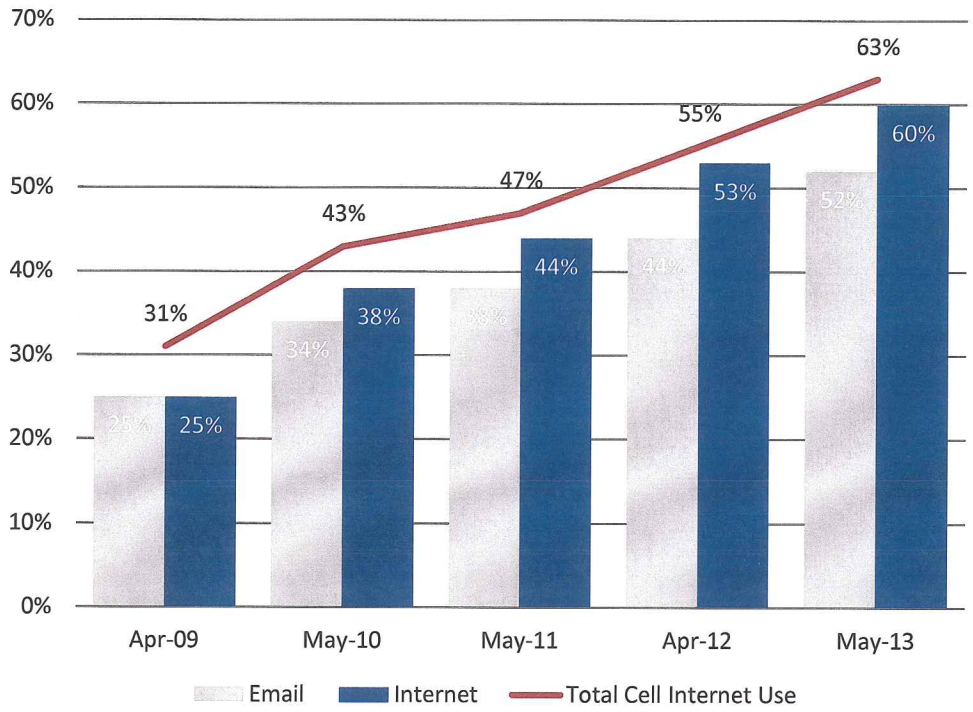
Media Inquiries:
202.419.4500

Summary of Findings

Nearly two-thirds (63%) of cell phone owners now use their phone to go online, according to a new survey by the Pew Research Center's Internet & American Life Project. We call them "cell internet users" and define them as anyone who uses their cell phone to access the internet or use email. Because 91% of all Americans now own a cell phone, this means that 57% of all American adults are cell internet users. The proportion of cell owners who use their phone to go online has doubled since 2009.

Almost two-thirds of cell owners go online using their phones

Among cell phone owners, the % who use the internet or email on their phone



Source: Pew Internet & American Life Project Spring Tracking Survey, April 17-May 19, 2013. N=2,076 cell phone owners ages 18+. Interviews were conducted in English and Spanish and on landline and cell phones. The margin of error for results based on cell phone owners is +/- 2.4 percentage points.

Additionally, one third of these cell internet users (34%) *mostly use their phone* to access the internet, as opposed to other devices like a desktop, laptop, or tablet computer. We call these individuals "cell-mostly internet users," and they account for 21% of the total cell owner population. Young adults, non-whites, and those with relatively low income and education levels are particularly likely to be cell-mostly internet users.

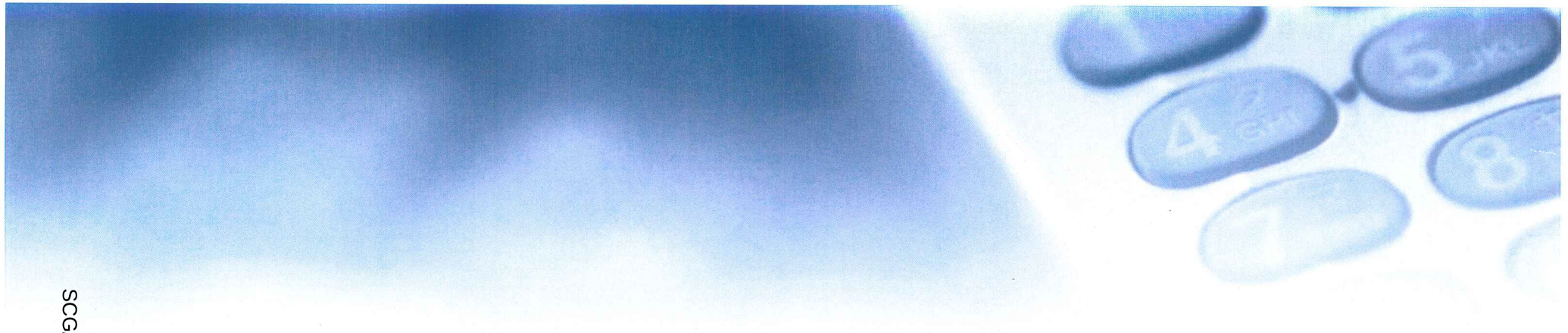
Supplemental Workpapers for Workpaper 2IN001

Footnote No. 47

Pew Research Center

Technology Adoption by Lower Income Populations

The entire document is available upon request.

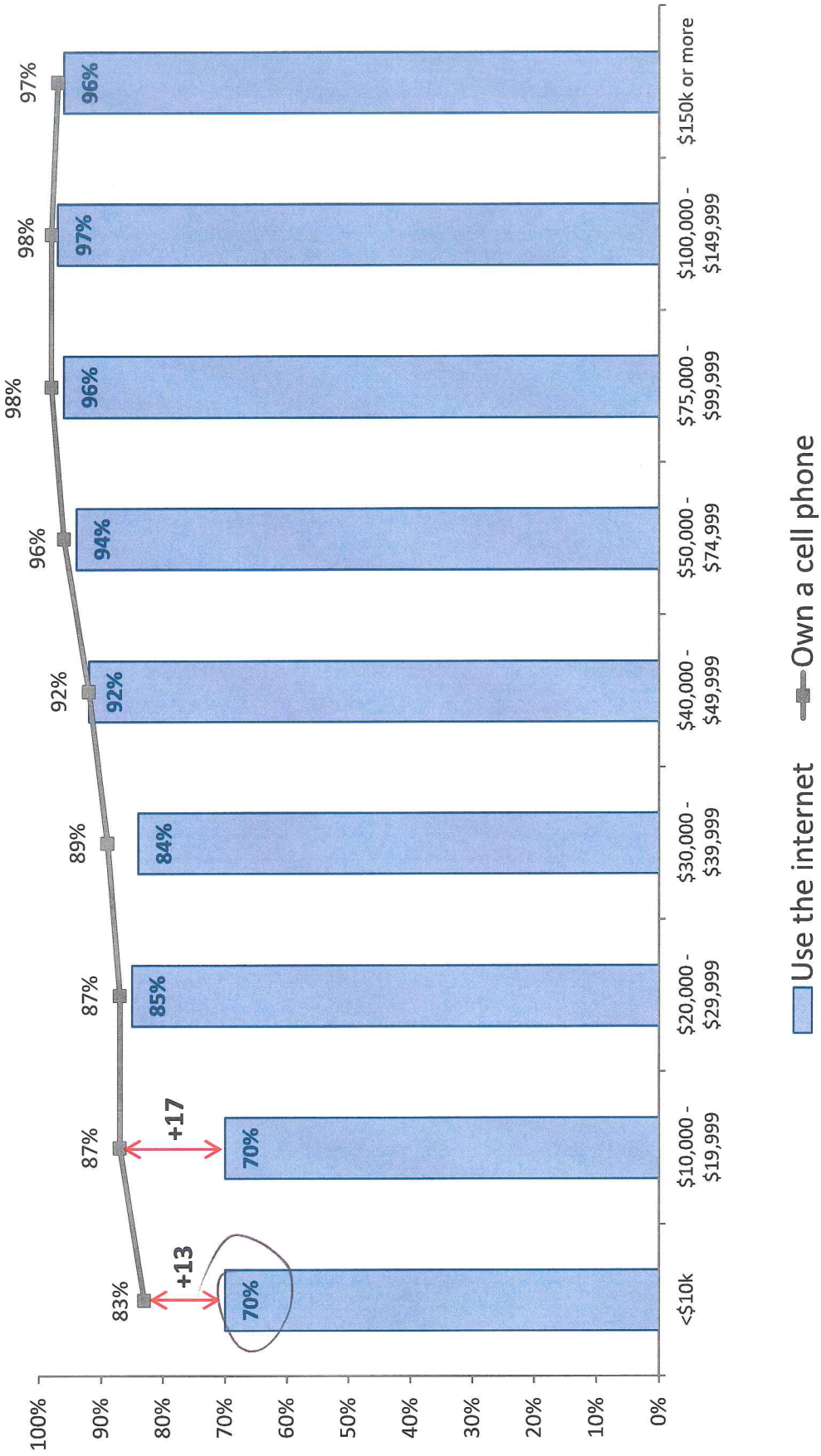


Technology adoption by lower income populations

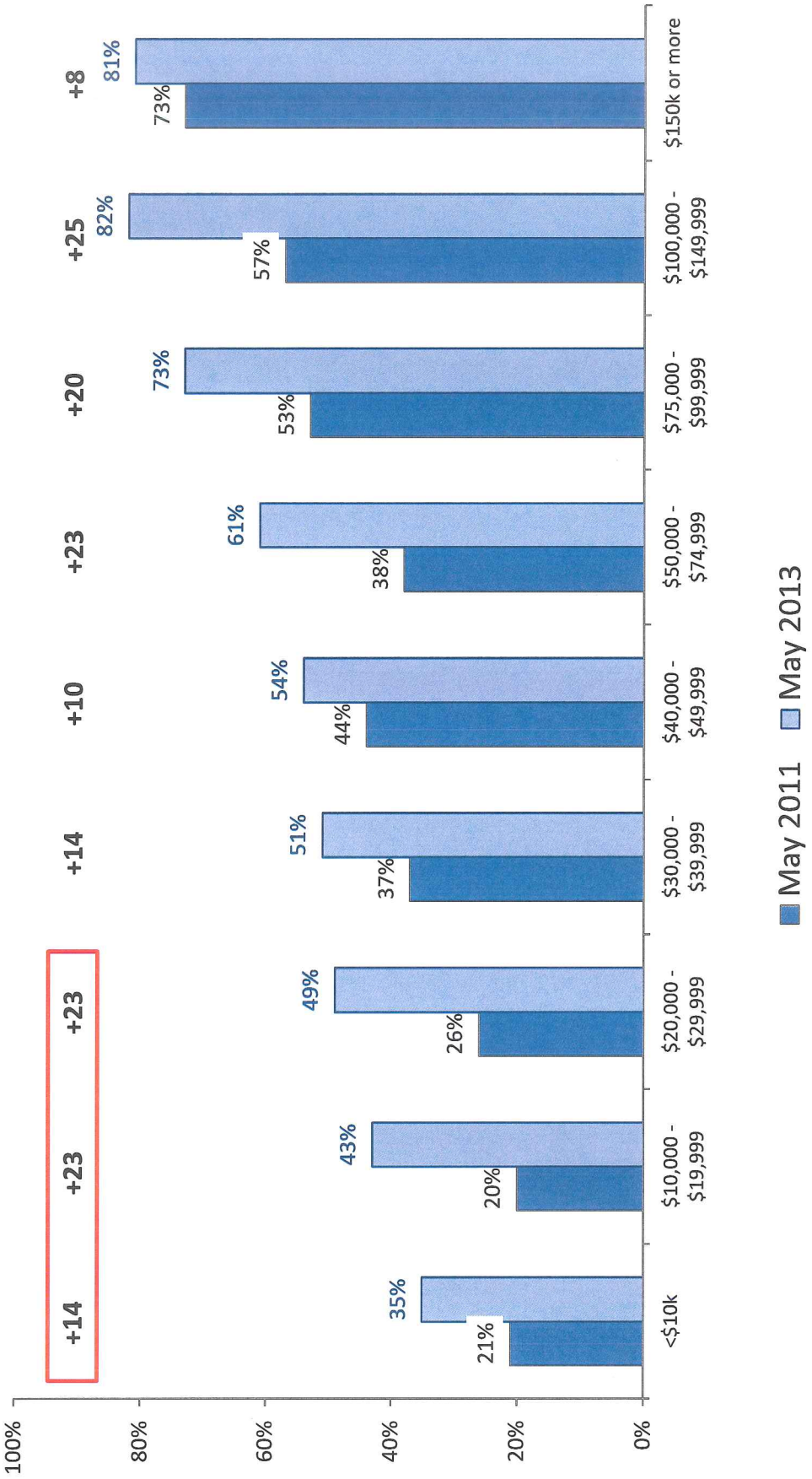
APHSA-ISM Annual Conference
October 8, 2013

Aaron Smith, Senior Researcher
Pew Research Center

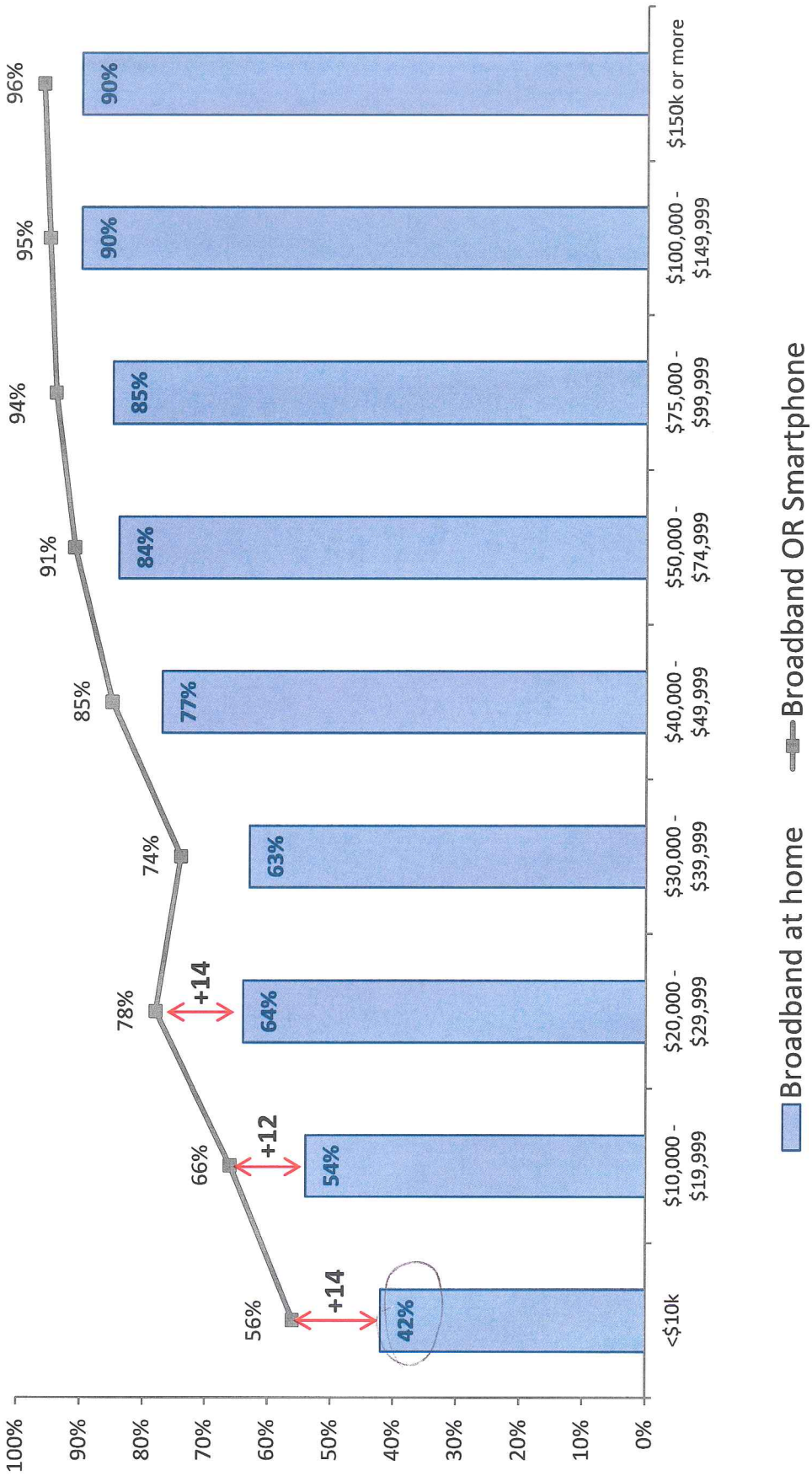
Cell ownership > internet use



Smartphone ownership over time



Impact of smartphones on "broadband" adoption



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Footnote No. 48

Deloitte

Deloitte Mobile Consumer Survey: Speed's Hot, Apps Not, Price Matters - Sometimes

Deloitte | TMT | Deloitte Mobile Consumer Survey: Speed's Hot, Apps Not, Price Matters – Sometimes

Mobile consumption continues to grow as 4G and Wi-Fi technologies become faster, device selection increases and usage profiles change.

New York, November. 20, 2013 — United States consumers, who are "addicted to speed" and often willing to pay more to get it, toggle between Wi-Fi and fourth-generation (4G) wireless technologies to get the fastest possible connection for their mobile devices. Released today, Deloitte's third edition "Global Mobile Consumer Survey" (GMCS) offers insight into consumer purchasing habits, wants and trends in the U.S., with a focus on mobile devices, technologies and services.

The survey reveals that Wi-Fi has grown significantly in the U.S. marketplace. In fact, nearly two-thirds of consumers now report that they most often connect their smartphones to Wi-Fi networks as opposed to a mobile network when using the Internet. Similarly, U.S. consumers also reported a willingness to spend more to get faster speeds. In fact, 41 percent of respondents indicated that they would be willing to pay more for substantially faster speeds (3x-5x), with nearly 10 percent willing to pay up to $30 on top of their current rates.

Wi-Fi and 4G are proving to be complementary. While years ago, 4G was thought to be a "Wi-Fi killer," the survey indicates the opposite is the case. Consumers who have already adopted 4G are actually more likely to seek out faster Wi-Fi alternatives when they need better speed/performance and/or are conscious about the cost of their mobile data plan (by an 11 percent margin over their non-4G counterparts). Usage of Wi-Fi "out and about" and "at someone else's home" is also increasing (with 44 percent of respondents indicating use at someone else's home), particularly in comparison to "at home" and "at work."

"What drives mobility and enables everything in the ecosystem is ultimately the wireless network," said Craig Wigginton, vice chairman and U.S. telecommunications sector leader, Deloitte LLP. "As consumers become more comfortable moving between types of networks, we anticipate a 'peaceful co-existence' between Wi-Fi and 4G to support all types of activities, be it for work, play or new types of social interactions."

Price matters…for Some

The survey also reveals that when choosing a particular smartphone device, consumers were split with regard to price based on whether they are smartphone owners or not. For non-smartphone owners, "cost of the device" was listed as the #1 reason for selecting their device, while it was last amongst the most common reasons for smartphone owners – no other response in the survey was less important than price for this group of tech-savvy consumers.

App Saturation?

The survey reveals that the number of app downloads, as well as per app spending actually decreased from 2012 to 2013 – with the greatest reduction coming in tablets. This decrease occurred not only in the

U.S. (decreasing 13 percent), but is also consistent across other countries surveyed with Brazil downloads decreasing 36 percent, Argentina decreasing 17 percent and Mexico decreasing 14 percent.

"The good news is, we see a lot of potential remaining in the apps marketspace over the long term," said Wigginton. "We believe that the overall declines indicated in this year's survey may be due to increasing sophistication among consumers. It is likely that they have already obtained the core apps they prefer for work and play, with those choices persisting over time as they upgrade and change their devices. "

BYOD: A Win/Win

Organizations are responding to the increasing use of mobile devices in the workplace. Currently, 45 percent of organizations have Bring Your Own Device (BYOD) policies. Surprisingly, a higher than expected 51 percent of employees who work where BYOD policies are offered primarily use their personal device as their work device and 58 percent of those personal device owners receive the same or more reimbursement. The survey also shows that one of the fears (technical incompatibility/ challenges) around BYOD may be less of a factor than anticipated with 69 percent of organizations who implemented a BYOD policy reporting they experienced no technical, or support related challenges.

The Future of NFC and Mobile Payments

Near-Field Communication (NFC) technology, while still niche, is showing strong use amongst a small group of consumers. The survey reveals that 10 percent of respondents say that their phone has NFC technology, a 103 percent increase from 2012. Additionally, over one third of the people who have the technology, have used it in the past month –indicating a small but loyal following.

The Tablet Effect

The survey shows that of all mobile devices, tablets have the fastest growth of ownership, increasing 48 percent since 2012. From a demographic standpoint, growth is greatest among those aged 25-34 with 74 percent year over year growth and the second largest growth is with those aged 55 and older (45 percent year over year growth). Tablets and smartphones are also replacing many other types of single-purpose devices including e-readers, music players, game players and video players; and there is strong growth in dual ownership of smartphones and tablets as well as of laptops and tablets.

Furthermore, tablet use is driving more smartphone use but less laptop use, with 34 percent of tablet owners indicating they now use their laptop less often. At the core of this phenomenon is that tablets are being used more as 'fixed' devices (albeit portable) than truly 'mobile' devices. The survey also notes that the most popular activities for tablets are those when consumers are typically fixed for longer periods of time – watching movies, streaming content, reading books, etc. – while smartphones are most popular for more dynamic activities, such as navigation, email and photos.

"Growth in tablets, particularly among select age groups, is still very strong. It's also important to note that tablets contribute to the strength of the larger mobile ecosystem, as our survey finds that they increase smartphone usage," concluded Wigginton. "Interestingly, although the use of tablets is increasing overall, we are not seeing this trend in the workplace. The majority of consumers are still not using their tablets for work-related activities. However, with the surprisingly strong data we saw around uptake of BYOD in the workplace, this trend may change."

About Deloitte's Technology, Media & Telecommunications Practice

Deloitte's technology, media & telecommunications practice serves more than 1,400 clients in the U.S., including the vast majority of market category leaders across all sector segments. Deloitte practitioners, many with direct industry experience, deliver a breadth of services including professional audit, consulting, enterprise risk management, financial advisory and tax. The practice is also home to the Deloitte Center for the Edge, which conducts original research and develops substantive points of view for new corporate growth. The Silicon Valley-based Center helps senior executives make sense of and profit from emerging opportunities on the edge of business and technology.

Supplemental Workpapers for Workpaper 2IN001

Footnote No. 49 & 50

ABI Research

Big Brand Tablet Installed Base to Surpass 285 Million by Year's End

Big Brand Tablet Installed Base to Surpass 285 Million by Year's End

Research News

Oyster Bay, New York - 19 Dec 2013

Tablets have been on the top of many wish lists since 2010 when Apple launched its first iPad device. The installed base of big brand (Apple, Samsung, etc.) media tablets is expected to surpass 285 million units at the close of 2013, according to new Market Data from intelligence firm ABI Research. The United States, which has been the largest single tablet market since inception, represents more than 70 million tablets alone, or about one for every four persons.

"Apple's early tablet lead is not as evident three years into the market's boom," says senior practice director, Jeff Orr. "The initial iPad shipments are aging out with the first wave of replacement tablets expected over the next six months. We believe about 51% of the tablet installed base is coming from iOS and 40% Android when all is said and done in 2013."

Samsung continues to make gains in the Android tablet segment with 20% growth experienced in 3Q'13. The company has significantly increased its marketing spend in the second half of the year as it promotes three distinct tablet sub-brands and looks to receive some halo effect from the success of its Galaxy S4 smartphones and the Galaxy Gear companion smart watch device.

Apple shored up its two-year ASP hemorrhaging in 3Q'13 by increasing nearly 1% to US$439. Unit shipments for the largest tablet vendor were down 4% from the previous quarter and revenues were down about 3% as the company geared up for the launch of its iPad Air and second generation iPad Mini devices. "Product transitions are rarely pretty, but ABI Research expects Apple to have a stellar 4Q'13 as it looks to satisfy an even larger audience purchasing tablets for the first time," adds Orr.

These "Media Tablet and eReader" Market Data findings are part of ABI Research's Media Tablets, Ultrabooks and eReaders Research Service.

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Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. Customer Assistance
Workpaper: 2IN002.000

Summary for Category: B. Customer Assistance

	In 2013$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	170	178	178	178
Non-Labor	2,664	3,222	3,825	4,075
NSE	0	0	0	0
Total	**2,834**	**3,400**	**4,003**	**4,253**
FTE	2.1	2.3	2.3	2.3

Workpapers belonging to this Category:

2IN002.000 CI-Customer Assistance

Labor	170	178	178	178
Non-Labor	2,664	3,222	3,825	4,075
NSE	0	0	0	0
Total	**2,834**	**3,400**	**4,003**	**4,253**
FTE	2.1	2.3	2.3	2.3

Note: Totals may include rounding differences.

Beginning of Workpaper
2IN002.000 - CI-Customer Assistance

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. Customer Assistance
Category-Sub 1. Customer Assistance
Workpaper: 2IN002.000 - CI-Customer Assistance

Activity Description:

The Customer Assistance organization delivers programs and services to Special Needs customers who benefit from assistance beyond traditional customer services. Special Needs customers are those residential customers with low or fixed incomes, and persons with medical conditions which require specialized medical equipment to maintain a suitable living environment.

Forecast Explanations:

Labor - 5-YR Average

Labor costs in this organization were relatively flat for the recorded 5-years period. 5-year average forecasting methodology is used as the basis for TY2016 forecast to reflect continual support of core business functions and activities as well as for consistency with all other Customer Service - Information areas, with additional forecast adjustments to account for specific program growth.

Non-Labor - 5-YR Average

Non-Labor costs in this organization have fluctuated across the recorded 5-years period. The fluctuation is largely attributed to a ramp up of NGAT program participation from 2009-2011 in association with increased ESAP program participation, and a decrease of costs in 2012 attributed to a subsequent delay of the new ESAP program cycle approval. For consistency with the Customer Service - Information forecasting methodologies for other areas, and to reflect such typical fluctuations in costs each year, 5-year average is used as the basis for TY2016 forecast, plus adjustments to account for specific program growth above the 5-year average activities.

NSE - 5-YR Average

Not applicable.

Summary of Results:

	In 2013$ (000) Incurred Costs							
	Adjusted-Recorded					Adjusted-Forecast		
Years	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labor	167	185	189	179	170	178	178	178
Non-Labor	2,224	3,367	3,433	3,404	2,664	3,222	3,825	4,075
NSE	0	0	0	0	0	0	0	0
Total	**2,390**	**3,552**	**3,621**	**3,582**	**2,834**	**3,400**	**4,003**	**4,253**
FTE	2.2	2.4	2.5	2.1	2.1	2.3	2.3	2.3

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. Customer Assistance
Category-Sub: 1. Customer Assistance
Workpaper: 2IN002.000 - CI-Customer Assistance

Forecast Summary:

In 2013 $(000) Incurred Costs										
Forecast Method		**Base Forecast**			**Forecast Adjustments**			**Adjusted-Forecast**		
Years		**2014**	**2015**	**2016**	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Labor	5-YR Average	178	178	178	0	0	0	178	178	178
Non-Labor	5-YR Average	3,018	3,018	3,018	204	807	1,057	3,222	3,825	4,075
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		**3,196**	**3,196**	**3,196**	**204**	**807**	**1,057**	**3,400**	**4,003**	**4,253**
FTE	5-YR Average	2.3	2.3	2.3	0.0	0.0	0.0	2.3	2.3	2.3

Forecast Adjustment Details:

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2014	0	204	0	204	0.0	1-Sided Adj

Adjustment for incremental NGAT costs. Accounts for costs associated with increased mandatory CO testing above and beyond the 5 year historical average NGAT spending level. Adjusted for forecast of 120,000 low income homes treated at current rate of $28.50/unit. This forecast assumes 85% of treated homes receive NGAT, which is reasonable based on historical trend.

2014 Total	**0**	**204**	**0**	**204**	**0.0**	

2015	0	807	0	807	0.0	1-Sided Adj

Adjustment for incremental NGAT costs. Accounts for costs associated with increased mandatory CO testing above and beyond the 5 year historical average NGAT spending level due to increased efforts to achieve mandatory CO testing and correlates with 2015-2017 Low Income Proceeding application target (118,000 low income homes treated). This forecast assumes 85% of treated homes receive NGAT, which is reasonable based on historical trend, and also based on $35.00/home costs which is a cost forecast that aligns with anticipated market conditions.

2015 Total	**0**	**807**	**0**	**807**	**0.0**	

2016	0	807	0	807	0.0	1-Sided Adj

Note: Totals may include rounding differences.

Area: CS - INFORMATION
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Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
Adjustment for incremental NGAT costs. Accounts for costs associated with increased mandatory CO testing above and beyond the 5 year historical average NGAT spending level due to increased efforts to achieve mandatory CO testing and correlates with 2015-2017 Low Income Proceeding application target (118,000 low income homes treated). This forecast assumes 85% of treated homes receive NGAT, which is reasonable based on historical trend, and also based on $35.00/home costs which is a cost forecast that aligns with anticipated market conditions.						
2016	0	250	0	250	0.0	1-Sided Adj
Incremental costs associated with expanded outreach activities and a new eligibility study related to the Medical Baseline program.						
2016 Total	**0**	**1,057**	**0**	**1,057**	**0.0**	

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. Customer Assistance
Category-Sub: 1. Customer Assistance
Workpaper: 2IN002.000 - CI-Customer Assistance

Determination of Adjusted-Recorded (Incurred Costs):

	2009 ($000)	2010 ($000)	2011 ($000)	2012 ($000)	2013 ($000)
Recorded (Nominal $)*					
Labor	128	146	155	151	146
Non-Labor	2,007	3,116	1,447	3,345	2,664
NSE	0	0	0	0	0
Total	**2,135**	**3,262**	**1,601**	**3,495**	**2,810**
FTE	1.8	2.0	2.1	1.8	1.8
Adjustments (Nominal $) **					
Labor	0	0	0	0	0
Non-Labor	0	0	1,854	0	0
NSE	0	0	0	0	0
Total	**0**	**0**	**1,854**	**0**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal $)					
Labor	128	146	155	151	146
Non-Labor	2,007	3,116	3,301	3,345	2,664
NSE	0	0	0	0	0
Total	**2,135**	**3,262**	**3,456**	**3,495**	**2,810**
FTE	1.8	2.0	2.1	1.8	1.8
Vacation & Sick (Nominal $)					
Labor	23	26	26	24	24
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**23**	**26**	**26**	**24**	**24**
FTE	0.3	0.4	0.4	0.3	0.3
Escalation to 2013$					
Labor	15	13	9	4	0
Non-Labor	217	252	131	59	0
NSE	0	0	0	0	0
Total	**232**	**264**	**140**	**63**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2013$)					
Labor	167	185	189	179	170
Non-Labor	2,224	3,367	3,433	3,404	2,664
NSE	0	0	0	0	0
Total	**2,390**	**3,552**	**3,621**	**3,582**	**2,834**
FTE	2.1	2.4	2.5	2.1	2.1

* After company-wide exclusions of Non-GRC costs
** Refer to "Detail of Adjustments to Recorded" page for line item adjustments
Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. Customer Assistance
Category-Sub: 1. Customer Assistance
Workpaper: 2IN002.000 - CI-Customer Assistance

Summary of Adjustments to Recorded:

In Nominal $ (000) Incurred Costs					
Years	**2009**	**2010**	**2011**	**2012**	**2013**
Labor	0	0	0	0	0
Non-Labor	0	0	1,854	0	0
NSE	0	0	0	0	0
Total	**0**	**0**	**1,854**	**0**	**0**
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2009 Total	**0**	**0**	**0**	**0.0**			
2010 Total	**0**	**0**	**0**	**0.0**			
2011	0	1,854	0	0.0	1-Sided Adj	N/A	CMAK201402201 42203560
One-sided adjustment - For purposes of accurately trending historical program costs in the forecast, a one time adjustment to incorporate NGAT charges billed to the 2011 Memorandum account as authorized by D.10-12-002 have been added. These are costs that will no longer be captured within the Memorandum account going forward.							
2011 Total	**0**	**1,854**	**0**	**0.0**			
2012 Total	**0**	**0**	**0**	**0.0**			
2013 Total	**0**	**0**	**0**	**0.0**			

Note: Totals may include rounding differences.

Supplemental Workpapers for Workpaper 2IN002.000

Supplemental Workpapers for Workpaper 2IN002

Footnote No. 5 & 54

California Public Utilities Commission

Decision 10-12-002

The entire document is available upon request.

ALJ/KK2/avs **Date of Issuance 12/3/2010**

Decision 10-12-002 December 2, 2010

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of Pacific Gas and Electric Company for Approval of the 2009-11 Low Income Energy Efficiency and California Alternate Rates for Energy Programs and Budget (U39M).	Application 08-05-022 (Filed May 15, 2008)
And Related Matters.	Application 08-05-024 Application 08-05-025 Application 08-05-026

DECISION GRANTING, IN PART, PETITION OF SAN DIEGO GAS & ELECTRIC COMPANY AND SOUTHERN CALIFORNIA GAS COMPANY TO MODIFY DECISION 08-11-031

1. Summary

This decision grants, in part, a joint petition to modify Decision (D.) 08-11-031 filed by San Diego Gas & Electric Company (U 902 E) and Southern California Gas Company (U 904 G), dated May 14, 2010 (Petition). The Petition raises five separate issues regarding D.08-11-031 and proposes related modifications to D.08-11-031. This decision grants, in part, the relief sought in the Petition by adopting some of the proposed modifications, while denying other proposed modifications requested therein for reasons set forth below.

2. Background

In Decision (D.) 08-11-031, the Commission approved the budgets for California's Large Investor Owned Utilities' (IOUs) Low Income Energy

Conclusion of Law

1. The petition for modification should be granted, in part, and denied, in part.

2. The Petitioners' request to modify D.08-11-031 to permit the Petitioners to establish memorandum accounts to track unanticipated and unforeseen NGAT costs in this proceeding is reasonable and therefore should be granted.

3. The Petitioners' request to clarify and modify OP 31 of D.08-11-031 to permit the utilities to allow disabled customers to self-identify as disabled is unnecessary and therefore should be denied.

4. Only part of the Petitioners' request to modify D.08-11-031 to include inadvertently omitted measures as approved LIEE measures is reasonable, justified and has merit; and therefore the related relief sought should be granted. The remaining part of the Petitioners' request to include other additional measures as approved LIEE measures lacks merit and should be denied. Attachment F to D.08-11-031, which has since been revised and titled as Revised Attachment F to D.09-11-009, should be further amended to reflect accurate list of approved LIEE measures resulting from this decision.

5. The Petitioners' request that the Commission modify D.08-11-031 to specifically acknowledge and set forth "Furnace Clean and Tune" as a separate add-back measure should be denied.

6. The Petitioners' request that the Commission modify D.08-11-031 to permit the Petitioners to eliminate the audit and rewards portion of the LIEE programs is unnecessary and should be denied.

Supplemental Workpapers for Workpaper 2IN002

Footnote No. 51 & 53

California Public Utilities Commission

Decision 08-11-031

The entire document is available upon request.

ALJ/SRT/sid **Date of Issuance 11/10/2008**

Decision 08-11-031 November 6, 2008

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of Pacific Gas and Electric Company for Approval of the 2009-11 Low Income Energy Efficiency and California Alternate Rates for Energy Programs and Budget (U39M).	Application 08-05-022 (Filed May 15, 2008)
And Related Matters.	Application 08-05-024 Application 08-05-025 Application 08-05-026

DECISION ON LARGE INVESTOR-OWNED UTILITIES' 2009-11 LOW INCOME ENERGY EFFICIENCY (LIEE) AND CALIFORNIA ALTERNATE RATES FOR ENERGY (CARE) APPLICATIONS

Conclusions of Law

1. We should allow LIEE marketing and outreach efforts to focus on customers with high energy use, burden or insecurity.

2. The IOUs should target neighborhoods with high energy usage/burden/insecurity, severe climate zones, or other customer segments in choosing where to install feasible measures first, so as to ensure the greatest energy savings from the LIEE program, but all customers shall ultimately receive measures.

3. The IOUs should focus on treating homes, rather than customers, because while a home will remain, its occupants may change.

4. The LIEE program should serve all willing and eligible customers.

5. The IOUs should use a segmentation approach which first locates neighborhoods with a large numbers of low income customers and thereafter segments eligible customers within each neighborhood by energy usage.

6. The IOUs should consider the particular neighborhood and its population when deciding which neighborhood outreach methods to employ.

7. The IOUs should work with willing local governments and agencies to understand which strategies work best in which neighborhoods.

8. The IOUs should use more aggressive outreach to target high energy users (and customers with late payment histories and on medical baseline), though not to the exclusion of low energy users.

9. The categorical eligibility requirements that apply to LifeLine should be the same as those for LIEE and CARE. The IOUs should allow customers receiving federal means-tested SSI to qualify for LIEE and CARE categorically.

10. IOUs should be allowed to add additional means tested programs to the list of programs that afford categorical eligibility for LIEE and CARE, so long as they receive approval to add such programs by Tier 2 Advice Letter.

11. IOUs should not segment customers by energy usage or other characteristics in deciding which measures to install.

12. We should require a "whole house" approach to meeting customer's energy needs, which focuses on making the state's entire housing stock energy efficient, rather than installing insignificant measures in a scattering of homes on a piecemeal basis.

13. Each house IOUs serve in the LIEE program should receive an individualized energy audit so that it receives all feasible measures necessary for maximal energy efficiency. To the extent the energy audit focuses on energy use, such information should not be used to limit the number of feasible measures installed in an eligible home.

14. In order to achieve long-term and enduring energy savings, a home should be treated with long-term occupancy patterns in mind, thus resulting in the installation of all feasible measures.

15. IOUs should minimize the number of times they visit a home as part of the LIEE program.

16. LIEE measure installation should occur at the same time as energy audits, except where impossible.

17. The IOUs should use the Whole Neighborhood Approach to minimize the number of trips the utility or its contractors make to serve eligible LIEE customers.

18. The Commission has discretion to determine what measures are feasible, taking into account cost effectiveness and hardships. Feasibility depends in part

on the cost effectiveness of measures. Feasibility must also focus on reducing energy-related hardships facing low income households.

19. "All feasible measures" for LIEE does not mean "all available measures."

20. We should adopt the following methodology, as of January 1, 2009, for determining whether specific measures are cost effective (taking into account the housing type as well as climate zone) and set forth an approach to screening all measures going forward:

a. Measures that have both a PC_m and a UCT benefit-cost ratio greater than or equal to 0.25 (taking into consideration the housing type and climate zone for that measure) for that utility shall be included in the LIEE program. This rule applies for both existing and newly measures.

b. Existing measures that have eight a PC_m or of a UCT benefit-cost ratio less than 0.25 shall be retained in the program.

c. Existing and new measures with both PC_m and UCT test results less than 0.25 for that utility may be included in the LIEE program for all climate zones if they consist of furnace repair and replacement or water heater repair and replacement. Air conditioning and evaporative cooling measures may be included in the LIEE program in hot climates (in accordance with the measure guidelines of the 2007-08 LIEE program, which disallowed cooling measures in temperate climate zones), subject to new reporting requirements. Heating and water heating measures in landlord-owned property may not be installed with LIEE funds, as landlords' legal habitability obligations require them to pay for such amenities.

22. We should require expanded reporting by IOUs on measures that fall below the 0.25 cost effectiveness threshold to determine the impact of such measures on *Plan* goals.

23. Any LIEE measure meeting the criteria in the foregoing two paragraphs should be eligible for installation in a low income customer's home, except where infeasible.

24. We approve the IOUs' cost effectiveness and energy savings analysis for purposes of the 2009 program year. The IOUs will perform a 2009 Impact Evaluation study and we also authorize them to perform a new Non Energy Benefits study. We expect the results of these studies to be used to show updated cost effectiveness numbers and new expected energy savings. Although we understand that the energy impacts cannot be pre-determined, we expect that energy savings will increase given the many changes this decision makes to the IOUs' programs. We also require the utilities to incorporate these new cost-effectiveness and energy savings numbers into their estimates in drafting their 2012-14 budget applications.

25. The IOUs should carry out the Non Energy Benefits study we authorize in this decision as early in 2009 as possible.

26. We should require that the IOUs' energy efficiency education – in which the IOUs inform and teach low income customers about the benefits of energy efficiency – occur close in time to installation of measures, rather than in a vacuum. We should allow IOUs to fund facilitated education, including workshops, provided such workshops target low income persons eligible or likely to be eligible for LIEE and take steps to enroll customers in LIEE.

27. We should disallow the portion of SCE's budget devoted to effort that involves education-only kits not tied to measure installation. We also should disallow SCE's proposal for "door-to-door canvassing structured to provide energy education and awareness to low income customers who might otherwise not be treated through LIEE due to ineligibility for LIEE measures."

28. PG&E's Energy Education workshops should not occur unless they lead to installation of energy efficiency measures or enrollment of customers in LIEE.

29. We do not have a record to determine the adequacy of the IOUs' ethnic marketing efforts. We should allow the IOUs to continue such marketing at current levels in 2009 (except PG&E, which should add ethnic marketing to its LIEE program for 2009). The single statewide ME&O program will have an ethnic marketing component.

30. The Commission and IOUs should focus on training for LIEE installation workers so those expanded programs also benefit from a trained workforce.

31. New state and federal law will drastically alter the marketplace for lighting, and it is imperative that we and the IOUs begin to prepare customers for the transition. Given the timelines in the legislation, such preparation must begin now.

32. Buying and installing lightbulbs should be a fungible activity funded equally across all IOUs.

33. Population growth should be taken into consideration in determining the number of customers eligible for LIEE.

34. Households treated under the LIHEAP program should also be counted as treated in determining the number of LIEE eligible customers, given that LIHEAP offers most of the same measures offered by LIEE.

35. The LIEE and CARE statutes do not allow for funding of programs such as PG&E's REACH utility shutoff assistance program.

36. We should not approve pilots or studies that the IOUs fail adequately to describe, or that would accomplish goals that are inconsistent with the mandates of this decision.

37. The Commission should approve SDG&E and SoCalGas' LIEE customer rewards program on a pilot basis.

38. The Commission should approve LIEE and CARE fund shifting consistently with its prior decisions.

39. Telling customers about services for which they are likely eligible is a basic utility function to be borne in general rates.

40. CARE recertification is essential so that ineligible customers do not receive the often substantial subsidies the program affords.

O R D E R

IT IS ORDERED that:

1. We approve 2009-11 Low Income Energy Efficiency (LIEE) and California Alternate Rates for Energy (CARE) budgets of the large investor owned utilities (IOUs), Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and Southern California Gas Company (SoCalGas), as follows:

Adopted Budget Summary 2009-2011				
	LIEE			
Utility	2009	2010	2011	Cycle Total
PG&E	$109,056,366	$151,067,347	$156,789,038	$416,912,752
SCE	$60,242,000	$61,561,082	$63,413,860	$185,216,942
SoCalGas	$49,571,908	$76,872,816	$78,256,269	$204,700,993
SDG&E	$21,184,008	$21,184,009	$20,327,606	$62,695,622
Total	$240,054,283	$310,685,254	$318,786,772	$869,526,309
	CARE			
	2009	2010	2011	Cycle Total
PG&E	$470,314,651	$479,331,337	$489,228,435	$1,438,874,423
SCE	$208,541,000	$213,312,000	$216,885,000	$638,738,000
SoCalGas	$139,132,786	$140,737,280	$142,489,637	$422,359,704
SDG&E	$49,961,816	$51,516,795	$53,064,454	$154,543,065
Total	$ 867,952,262.40	$ 884,899,422.01	$ 901,669,537.33	$ 2,654,515,191.74

2. We authorize the IOUs their requested LIEE Marketing, Education & Outreach (ME&O) budgets, adjusted to reflect new LIEE population estimates,

subject to the restriction that they may only expend 1/3 of their requested 2009-11 budgets for 2009. The IOUs shall hold the remaining 2/3 of their ME&O budgets (the amounts for 2010 and 2011) in abeyance as the Commission works to develop a single statewide ME&O program that supplants existing IOU ME&O for 2010 and beyond.

3. To ensure that the IOUs' ME&O and the single statewide ME&O program are coordinated, the IOUs shall stay abreast of developments on the ME&O program as part of the general Energy Efficiency proceeding.

4. The IOUs shall coordinate 2009 LIEE marketing so that it is consistent with the developing single statewide ME&O program.

5. The IOUs shall not spend ME&O funding we allocate for 2010-11 except on the single statewide ME&O program, which we expect to be in place in late 2009 or early 2010 as part of the Commission's general Energy Efficiency proceeding.

6. The IOUs shall, for the 2009-11 period, continue or institute the LIEE targeted self-certification and enrollment activities the Commission ordered for 2007-08 in Decision (D.) 06-12-038. Such LIEE self-certification and enrollment consists of offering LIEE in areas of their service territory where 80% of the customers are at or below 200% of the federal poverty line.

7. The IOUs shall immediately make all categorical eligibility requirements that apply to LifeLine the same as those for LIEE and CARE.

8. The IOUs shall allow customers receiving federal means-tested Supplemental Security Income (SSI) to qualify for LIEE and CARE categorically.

9. The IOUs shall investigate the eligibility requirements of each of the benefits programs that qualify customers for LifeLine. If the IOUs find that certain listed programs have eligibility requirements that differ from the requirements applicable to LIEE and CARE, they may file with Energy Division

a request for a workshop, listing the programs that present problems, the problems at issue, and their proposed response. If Energy Division finds the workshop request has merit, it will schedule a workshop at that time, but it need not do so if it is able to resolve the IOUs' concerns in another manner.

10. The IOUs may add additional means-tested programs to the list of programs that confer categorical eligibility on customers seeking CARE or LIEE benefits beyond those identified in the preceding three ordering paragraphs. The IOUs shall seek such additions by Tier 2 Advice Letter.

11. Unless otherwise provided in this decision, all Advice Letters this decision requires shall be Tier 2 Advice Letters pursuant to General Order 96-B.

12. To carry out the "Whole Neighborhood Approach," the IOUs shall use their own data about customer energy usage, late bill payment, and service shutoffs or threatened shutoffs to find neighborhoods (including rural areas) with concentrated high energy usage, burden and insecurity.

13. We expect the IOUs to work with the Energy Division in carrying out the Whole Neighborhood Approach, and delegate responsibility to Energy Division to offer additional guidance and oversight to ensure that the IOUs follow the approach in an efficient manner.

14. IOUs may segment customers by energy usage or other attributes in conducting LIEE outreach.

15. The IOUs shall install all feasible measures for all eligible LIEE customers.

16. The IOUs shall pursue a "whole house" approach to meeting LIEE customers' energy needs. Each eligible home shall receive an individualized energy audit so that it receives all feasible measures necessary for maximal energy efficiency. To the extent an energy audit focuses on the energy use in a

home, such usage shall not be used to lower the number of feasible measures to be installed in the home.

17. We adopt the following methodology, as of January 1, 2009, for determining whether specific measures are cost effective (taking into account the housing type as well as climate zone) and set forth an approach to screening all measures going forward:

a. Measures that have both a PC_m and a UCT benefit-cost ratio greater than or equal to 0.25 (taking into consideration the housing type and climate zone for that measure) for that utility shall be included in the LIEE program. This rule applies for both existing and new measures.

b. Existing measures that have either a PC_m or a UCT benefit-cost ratio less than 0.25 shall be retained in the program.

c. Existing and new measures with both PC_m and UCT test results less than 0.25 for that utility may be included in the LIEE program for all climate zones if they consist of furnace repair and replacement or water heater repair and replacement. Air conditioning and evaporative cooling measures may be included in the LIEE program in hot climates (in accordance with the measure guidelines of the 2007-08 LIEE program, which disallowed cooling measures in temperate climate zones), subject to new reporting requirements. Heating and water heating measures in landlord-owned property may not be installed with LIEE funds, as landlords' legal habitability obligations require them to pay for such amenities.

18. The IOUs shall forecast, for 2009-2011 (per year and for the full three year period), for any measure that we include in the program that falls below the 0.25 cost effectiveness threshold test, the following:

- The measure type and climate zone;

- How many such measures the IOU anticipates installing in 2009-2011 in each "add-back" climate zone;
- The budget impact of the "add-backs," and
- The energy savings impacts of the "add-backs,"" based on the assumption that installation of measures that do not already exist in a home will increase, rather than decrease, energy usage.

19. The IOUs shall report in their annual reports, for the prior year, the actual figures in each of the foregoing four categories. If the LIEE measure "add-backs," this decision allows will compromise the IOUs' ability to meet the 2020 *Plan* goal that 100% of eligible and allows willing customers will have received all cost effective LIEE measures, the IOUs shall include a narrative in their annual reports on how they propose to address the shortfall in other parts of their LIEE program. We direct Energy Division to examine these reports when they are submitted, and to recommend Commission action aimed at enhancing program energy savings if the information reported shows a lack of progress toward meeting *Plan* goals.

20. The provisions of the foregoing ordering paragraphs regarding furnace repair and replacement and water heater repair and replacement are subject to the holding in D.07-12-051 that landlords are responsible, pursuant to the warranty of habitability, for providing heating and water heating to their tenants. No cost of furnace repair and replacement or water heater repair and replacement shall be borne by the LIEE program in rental housing.

21. IOUs shall perform a 2009 Impact Evaluation study and Non Energy Benefits study. The IOUs shall report the results of these studies once the studies are completed. We anticipate that these reported results will show that energy savings of the LIEE portfolio are increasing over time, with a closer correlation

between program spending and energy savings than shown in the IOUs' 2009-11 budget applications.

22. We require that the IOUs' energy efficiency education – in which the IOUs inform and teach low income customers about the benefits of energy efficiency – occur close in time to installation of measures, rather than in a vacuum. We allow IOUs to fund facilitated education, including workshops, provided such workshops target low income persons eligible or likely to be eligible for LIEE and take steps to enroll customers in LIEE.

23. We disallow the portion of SCE's budget devoted to effort that involves education-only kits not tied to measure installation. We also disallow SCE's proposal for "door-to-door canvassing structured to provide energy education and awareness to low income customers who might otherwise not be treated through LIEE due to ineligibility for LIEE measures."

24. To the extent PG&E's Energy Education workshops do not result in installation of energy efficient measures, they shall be removed from PG&E's LIEE program.

25. We allow the IOUs approximately one third of their proposed ME&O funding to pursue their own, individual marketing campaigns in 2009. The IOUs shall implement this marketing in coordination with the *California Long-Term Energy Efficiency Strategic Plan's (Plan)* work on a single statewide ME&O program.

26. Those IOU personnel involved in developing the single statewide ME&O program shall communicate with the IOUs' LIEE program personnel and ensure that 2009 IOU marketing for the LIEE program is consistent with the direction of the single statewide ME&O program.

27. For 2010-11, while we approve the IOUs' requested funding, we do not allow the IOUs to spend the funds on the marketing efforts they propose. Rather, they shall hold this money in reserve so that it forms part of the single statewide ME&O program budget. Once we approve the single statewide ME&O program in our Energy Efficiency proceeding, the IOUs will receive further direction on how to allocate this funding.

28. PG&E's shall add a LIEE component to its ethnic advertising campaign for 2009.

29. We set a goal for the IOUs to increase their disabled household enrollments for the 2009-11 program years so that customers with disabilities customers comprise approximately 15% of new LIEE enrollments annually.

30. We require the IOUs to leverage their LIEE program outreach with the Commission's Deaf and Disabled Telecommunications Program (DDTP) and disability-related community based organizations (CBOs) in California.

31. We will allow IOUs to count customers they enroll in LIEE as a result of leveraging with CBOs that serve the disabled community, or with the DDTP, toward the 15% annual disabled enrollment goal. IOUs may also count customers who voluntarily self-identify as disabled or whom the IOUs enroll from the Medical Baseline program, but should not ask customers whether they are disabled. Rather, the IOUs may count as disabled persons who voluntarily describe themselves as having a disability, persons who have an observed disability such as a mobility, vision or hearing disability, and persons who use TTY/TDD or request accessible formats of written materials (*i.e.*, large print and/or Braille).

32. IOUs shall enroll in CARE all eligible customers they add to the LIEE program as part of the 15% goal for enrollment of customers with disabilities.

33. We require that the IOUs report the status of their efforts to enroll persons with disabilities in their annual reports to the Commission identifying the level to which their efforts meet the 15% penetration goal. In cases where the participation from the disabled community is below the 15% goal, the IOUs shall provide an explanation.

34. The IOUs shall track the training and hiring of a low income energy efficiency workforce, and report on progress in their annual reports.

35. The Commission directs the Energy Division to issue a Request For Proposals for the development of Workforce Education and Training (WE&T) pilot programs. The selected proposals shall receive funding to be distributed by the utility in the pilot's service territory.

36. IOUs or their agents shall install all CFLs distributed in the LIEE program.

37. The IOUs or their agents shall remove old bulbs after installing CFLs, unless a customer asks to keep the old bulbs.

38. The IOUs shall include information with CFLs explaining how to dispose of them safely.

39. This decision does not establish any presumption for ratepayer CFL funding in the pending general Energy Efficiency applications.

40. We set a maximum $6.90 per installed bulb cost that is the same across IOUs, although IOUs shall install bulbs at a lower cost if they can negotiate the costs downward. The IOUs shall charge less than $6.90 if their actual cost is lower than this amount.

41. The IOUs shall immediately pursue joint lightbulb procurement, warehousing, transportation and related expenses unless such procurement will raise the per-bulb price above $1.90 and/or the overhead and related expense per bulb above $5.00.

42. The IOUs shall begin monitoring whether lightbulb shortages are threatened, and begin contingency planning if shortages or bulb price increases appear possible. They shall also notify the Energy Division in their monthly reports if shortages may affect the LIEE program.

43. For the 2009–11 LIEE budget cycle, the utilities' programs may continue to install CFLs as part of their standard measures, because they still have potential for cost effective energy savings in low income households, when installed.

44. As new technologies in lighting come into play between 2009 and 2011, the IOUs shall adhere to the new legal standards in introducing lighting measures to LIEE portfolios. They shall report in their annual reports their preparation to meet the new legal requirements.

45. Should the general Energy Efficiency decision, expected in 2009, develop a major shift in lighting focus for the state, the IOUs may need to readjust their lighting portfolios midcourse to reflect such changes.

46. We allow the IOUs to go back and treat any dwelling not treated since 2002, but the IOUs shall first seek out new dwellings that have not yet been treated. In their annual reports, IOUs shall distinguish between customers treated as "go backs" and brand new customers/dwellings so the Commission has clear information on the number of new customers/dwellings added to the LIEE program.

47. We eliminate the 3 Measure Minimum rule (which prohibits IOUs from installing measures in a home that does not require at least three measures) in favor of a rule that allows IOUs to install one or two measures in a home, as long as the measures achieve energy savings of at least either 125 kWh/annually or 25 therms/annually. Attachment G to this decision specifies, based on the data the IOUs provided with their applications, which measures qualify.

48. The utilities shall treat a total of 1,055,096 households over the next budget cycle to meet 25% of the programmatic initiative, as shown in the following table:

Projected Number of Homes to be Treated 2009-2011								
	2009		2010		2011			
Utility	Original	New Projection	Original	New Projection	Original	New Projection	Total Cycle - Original	Total Cycle - New
PG&E	80,000	90,903	110,000	124,991	110,000	124,991	300,000	340,884
SCE	75,243	83,445	75,243	83,445	75,243	83,445	225,729	250,336
SoCalGas	95,000	110,864	123,000	143,540	125,000	145,874	343,000	400,279
SDG&E	20,000	20,384	20,000	20,384	20,000	20,384	60,000	61,152
Total	270,243	305,596	328,243	372,360	330,243	374,694	928,729	1,052,651

49. In order to be counted as successful, IOUS shall demonstrate that their integration efforts accomplish at least two of the following four goals:

- *Interdepartmental Coordination:* Increased coordination in work efforts between departments within the utility. This type of integration results in cost and/or resource savings as well as one or both of the following:
  - Consolidation of work efforts,
  - Elimination of overlapping and/or repetitive tasks.

- *Program Coordination:* Increased coordination between multiple programs managed by the utility. This type of integration results in cost and/or resource savings as well as one or both of the following:
  - Increased services provided to customers,
  - Greater number of customers served by a program.

- *Data Sharing:* Increased information and data sharing between departments within the utility and/or multiple programs managed by the utility. This type of integration results in cost and/or resource savings as well as one or both of the following:
  - Greater number of customers served,
  - Consolidation of work efforts.

- *ME&O Coordination:* Consolidation of marketing, education and outreach for multiple programs managed by the utility. This type of integration results in cost and/or resource savings as well as any or all of the following:
  - Greater number of customers reached,

- More cost effective marketing, education and/or outreach to customers,
- Elimination of customer confusion.

50. We decline DRA's proposal to discontinue the Quarterly Public Meetings.

51. IOUs shall track and report the status of each of the integration efforts listed in their applications or *Plan* submissions in their annual report submitted to the Commission each May. In cases where the integration effort does not meet at least two of the above goals, the IOUs shall provide a reasonable explanation. We direct Energy Division to review the reports and work with IOUs to enhance integration during the 2009-11 cycle if our metrics are not met.

52. The utilities shall coordinate all LIEE outreach with CARE.

53. The IOUs shall pursue integration in other program functions such as income verification.

54. All utilities shall increase coordination between LIEE and Energy Efficiency departments, thereby achieving greater interdepartmental coordination.

55. The utilities shall examine current and future Local Government Partnerships and pursue any potential synergies that exist with the LIEE program to ultimately reduce costs.

56. The IOUs shall make sure that what they learn in their Demand Response proceedings is leveraged with the LIEE program.

57. In accordance with D.07-11-045, the Commission directs the utilities to remove any barriers to LIEE participation for eligible customers who wish to participate in the CSI low income programs. Solar applicants shall be fast-tracked through the LIEE program in the event that a waiting list for LIEE measure installation exists.

58. Low income single family homeowners may receive solar facilities (1) if they have already received all feasible LIEE measures, or (2) if they are on the waiting list to receive such measures.

59. IOUs shall use the following three criteria to measure the level of success of each of their leveraging efforts and partnerships:

(i) Leveraging results in dollars saved;

(ii) The opportunity results in energy savings/benefits; and

(iii) The opportunity results in enrollment increases.

60. The IOUs shall report the extent to which their LIEE leveraging efforts meet the foregoing metrics in their annual reports provided each May to the Commission. In cases where the leveraging effort or relationship does not meet a criterion, the IOU shall provide a reasonable explanation. We direct Energy Division to review the reports and work with IOUs to enhance leveraging during the 2009-11 cycle if our metrics are not met.

61. IOUs shall use all available resources that will assist them in determining, before a LIEE contractor goes to a home, whether that home has received LIHEAP measures and the type of measures involved.

62. The IOUs shall make arrangement with DCSD or LIHEAP contractors to have their personnel trained on what the LIHEAP program entails.

63. Our goal is full LIHEAP and LIEE leveraging, as well as ensuring that LIHEAP and LIEE measure installation happen at the same time, or sequentially, as part of the Whole Neighborhood Approach. The IOUs shall assist in working with DCSD and the Commission to develop a database that will allow IOUs and their contractors to determine if a home has already received LIHEAP service,

and the measures installed. They shall also use all means currently available to determine such service by LIHEAP.

64. Each IOU shall make a reasonable effort to differentiate between eligible and ineligible public housing residents for CARE and LIEE enrollment, and only enroll eligible public housing residents in the programs. We grant the IOUs discretion how to do this in each of their service areas.

65. Natural Gas Appliance Testing (NGAT) funding shall be from general rates and not the LIEE program. No IOU shall request otherwise in future LIEE requests, as we have resolved the issue in the same manner for many LIEE program cycles.

66. PG&E shall not reduce the number of LIEE customers it serves as a result of our holding on NGAT funding.

67. The IOUs shall coordinate with the Energy Division to incorporate all changes we make in this decision to the relevant sections of the 2006 LIEE Policy and Procedures Manual within 180 days of the effective date of this decision. The IOUs shall thereafter serve a link to the updated version of the Manual on the service list for this proceeding.

68. For all pilots and studies we approve here, all IOUs shall meet with Energy Division staff, and the other IOUs, and other stakeholders to review the pilots' and studies' results. In the annual reports filed after the completion of each pilot, the affected IOUs shall make clear recommendations as to whether the pilots should be expanded statewide.

69. We approve the following budgets for pilots and studies for 2009-11:

Supplemental Workpapers for Workpaper 2IN002

Footnote No. 55

Southern California Gas Company

Medical Baseline Allowance

For Your Home

- My Account
- Your Gas Bill
- Rebates
- Save Energy at Home
- Bill Assistance
  - California Alternate Rates for Energy (CARE)
  - Energy Savings Assistance Program
  - Middle Income Direct Install Program (MIDI)
  - Low Income Home Energy Assistance Program
  - Gas Assistance Fund (GAF)
  - **Medical Baseline Allowance**
- Self Service Options

Medical Baseline Allowance

SoCalGas cares about your health

Southern California Gas Company (SoCalGas) knows that not all customers are alike. Some households may have family members with health concerns that require using the heater more during cool weather.

If you or a member of your household has serious health condition, the Medical Baseline Allowance may be able to provide an additional allowance of gas at a lower rate.

Stay warm. Stay healthy.

The Medical Baseline Allowance is here to help. A household may qualify if a member:

- has a life-threatening illness or a compromised immune system
- is seriously disabled
- requires more heat in winter due to a serious health condition or to prevent deterioration of the person's medical condition

Medical Baseline Allowance facts

- The Medical Baseline Allowance provides gas at the lowest rate.
- Eligibility is NOT based on income.
- Qualifying conditions include medical illnesses for which additional heating is medically necessary.
- You can own or rent your housing.
- Gas service does not have to be in the M al Baseline patient's name.
- A household can have the Medical Base Allowance in conjunction with other assistance programs.
- The allowance includes space heating but NOT spas or pools for therapy.
- Covered conditions include (but are not limited to): Paraplegia, Quadriplegia, Hemiplegia, Multiple Sclerosis, Scleroderma, compromised immune system and life threatening illness.
- Doctor's certification is required.

FEEDBACK

Apply today!

Applying for the Medical Baseline Allowance is easy. Use the links below to download an application and instructions.

» Medical Baseline Application (PDF)

More information

The Medical Baseline Allowance provides an additional daily allowance of .822 therms at the baseline rate for people with certain medical conditions. This is approximately 25 more therms per month at the lowest rate.

You may qualify for Medical Baseline Allowance even if your landlord bills you for your natural gas. The landlord will reflect the allowance on your billing statement.

Questions, please call:

English 1-877-238-0092

Español 1-800-342-4545

國語 1-800-427-1429

粵語 1-800-427-1420

한국어 1-800-427-0471

Tiếng Việt 1-800-427-0478

For other languages 1-888-427-1345

Hearing impaired (TDD)
1-800-252-0259

Did you know?

You can pay your SoCalGas bill and schedule appliance service orders online through My Account. Sign up today for 24/7 access to your account.

Check Your Appliances
Create an Online Account
Save Energy and Money
Homebuilder Services
California Advanced Homes Program
Monthly Gas Prices
Careers
Privacy Notice
Privacy Policy
Instagram *
Newsletter

* *By clicking the link, you will leave socalgas.com and transfer directly to the website of a third party provider which is not part of Southern California Gas Company. The Terms and Conditions and Privacy Policy on that website will apply.*

Supplemental Workpapers for Workpaper 2IN002

Footnote No. 57

Southern California Gas Company

Gas Assistance Fund

For Your Home

My Account
Your Gas Bill
Rebates
Save Energy at Home
Bill Assistance
California Alternate Rates for Energy (CARE)
Energy Savings Assistance Program
Middle Income Direct Install Program (MIDI)
Low Income Home Energy Assistance Program
Gas Assistance Fund (GAF)
Medical Baseline Allowance
Self Service Options

Gas Assistance Fund

Do you need help paying your gas bill?

During the winter months qualified customers having difficulty paying their gas bills can get relief through the Gas Assistance Fund (GAF).

This helpful program may be able to provide you--or someone you know--with a **one-time grant** for the amount of the gas bill, not exceeding $100.[1]

The program is a joint effort of Southern California Gas Company (SoCalGas®) and United Way of Greater Los Angeles who work with approximately 80 to 100 volunteer nonprofit, community-based organizations.

Do you qualify for GAF assistance?

To qualify for GAF, you must meet the following requirements:

- The gas bill must be in the name of the applicant requesting assistance
- The bill address must be the applicant's primary residence.
- The applicant must not apply for more than the maximum GAF allowance for the current program year.
- The applicant must meet the income guidelines listed below:

Number of persons in household	Total yearly household income** no more than
1	$31,460
2	$31,460
3	$39,580
4	$47,700
5	$55,820
6	$63,940
7	$72,060
8	$80,180

For each additional person in your household add $8,120.
** Includes current household income from all sources before deductions.

These income guidelines are effective June 1, 2014 to May 31, 2015.

Apply for GAF one-time grants

To apply to receive GAF assistance, please contact the non-profit partner organization in your area. Partner organizations are listed on the United Way GAF Agency Roster.*

Help a friend or neighbor keep warm this winter by donating to GAF

Since 1983, the Gas Assistance Fund has used generous donations to help over 186,000 disadvantaged Southern California residents pay their winter natural gas bills. More than $14.5 million has been disbursed through the program.

Donate now -- and make a difference!

Anyone can help with this worthy cause, so please consider making a tax-deductible donation online via the United Way website* or via postal mail.

Donations

You can make your tax-deductible donation online or via postal mail:

United Way website *

Mail:
United Way Gas Assistance Fund
File 56826
Los Angeles, CA 90074-6826

Information card:
Our Permit to Solicit Donations to GAF (PDF)

Questions, please call:

For more information on this program, please call:

English 1-877-238-0092

Español 1-800-342-4545

國語 1-800-427-1429

粵語 1-800-427-1420

한국어 1-800-427-0471

Tiếng Việt 1-800-427-0478

For other languages 1-888-427-1345

Hearing impaired (TDD)
1-800-252-0259

FEEDBACK

[1] This program is made possible by generous donations from our employees, shareholders and ratepayers. Shareholder donations to the Gas Assistance Fund (GAF) do not affect gas rates. During the last program cycle GAF distributed $948,014 to 10,614 households; providing an average gas bill assistance of $89.00. Thanks to all who contribute and make this important program a success!
[2] Funds are available on a first come, first served basis until depleted.
[3] Includes current household income from all sources before deductions. These income limits are effective June 1, 2014 to May 31, 2015.

** By clicking the link, you will leave socalgas.com and transfer directly to the website of a third party*

provider which is not part of Southern California Gas Company. The Terms and Conditions and Privacy Policy on that website will apply.

Supplemental Workpapers for Workpaper 2IN002

Footnote No. 58

Southern California Gas Company

Low-Income Home Energy Assistance Program

English Español

Help Center

For Your Home | For Your Business | Safety | Innovation | Customer Service

Search or Ask a question here

Home > For Your Home > Assistance Programs > Liheap

For Your Home

- My Account
- Your Gas Bill
- Rebates
- Save Energy at Home
- **Bill Assistance**
  - California Alternate Rates for Energy (CARE)
  - Energy Savings Assistance Program
  - Middle Income Direct Install Program (MIDI)
  - **Low Income Home Energy Assistance Program**
  - Gas Assistance Fund (GAF)
  - Medical Baseline Allowance
- Self Service Options

Low-Income Home Energy Assistance Program

In addition to SoCalGas' programs, customers may qualify for other energy assistance programs:

Low-Income Home Energy Assistance Program (LIHEAP)

If you're income-qualified, LIHEAP (a federally funded energy assistance program) may help you pay your utility bill. Funds pledged to assist customers of SoCalGas are distributed through local community-based organizations, assistance agencies and certain government agencies.

LIHEAP Weatherization Assistance Program

Customers may also benefit from the LIHEAP Weatherization Assistance Program to help make their homes more energy efficient. This program also provides no-cost or reduced-cost Compact Florescent Lights (CFL), and refrigerator replacement. Check with your electric utility or LIHEAP about refrigerator programs.

For more information about LIHEAP programs contact the Departments of Community Services and Development at www.csd.ca.gov* or call us at 1-866-675-6623; Hearing Impaired, TDD/TTY 1-916-263-1402 or CA Relay Service 711.

*By clicking the link, you will leave www.socalgas.com and transfer directly to the website of a third party provider which is not part of the Southern California Gas Company. The Terms and Conditions and Privacy Policy on that website will apply.

Questions, please call:

Get more information **1-866-675-6623**

Hearing impaired TDD/TTY
1-916-263-1402
or CA Relay Service **711**

Did you know?

You can pay your SoCalGas bill and schedule appliance service orders online through My Account. Sign up today for 24/7 access to your account.

Service for Home	Service for Business	Clean Energy Solutions	Serving Communities	Our Site	Connect with Us
Start Service Online	Information by Industry	Advanced Meter	Gas Safety	Help Center	Facebook *
Move Service Online	Ways to Save Energy and Money	Energy Resource Center	The Energy of Community	Rates & Regulatory	Twitter *
More Time To Pay Your Bill?	Rebates	Natural Gas Vehicles	About Us	Site Map	YouTube *
Rebates	CNG Refueling	Sustainability	Newsroom	Accessibility	Instagram *
Check Your Appliances	Homebuilder Services		Careers	Terms and Conditions	Newsletter
Create an Online Account	California Advanced Homes Program			Privacy Notice	
Save Energy and Money	Monthly Gas Prices			Privacy Policy	

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FEEDBACK

Supplemental Workpapers for Workpaper 2IN002

Footnote No. 64, 66 & 68

Southern California Gas Company

NGAT Cost Components Calculation 2009 - 2016

NGAT COST COMPONENTS CALCULATION
2009 - 2016

	Year	# of Treated Homes	# of Homes That Received NGAT	Homes Treated (%)	NGAT Annual Cost ($000)	NGAT Cost Per Unit	NGAT Cost Per Unit (2013 $s)	NGAT Annual Cost (2013 $s)
Recorded Historical	2009	83,493	66,681	80%	$ 1,915	$ 28.72	$ 31.82	$ 2,122,087.30
	2010	120,358	96,475	80%	$ 2,765	$ 28.66	$ 30.98	$ 2,988,705.28
	2011	161,020	116,507	72%	$ 3,217	$ 27.62	$ 28.72	$ 3,345,592.18
	2012	96,893	91,253	94%	$ 2,644	$ 28.97	$ 29.48	$ 2,690,494.05
	2013	106,948	86,400	81%	$ 2,368	$ 27.41	$ 27.41	$ 2,368,283.94
	5 Yr Avg	**113,742**	**91,463**	**81%**	**$ 2,582**	**$ 28.28**	**$ 29.68**	**$ 2,703,032.55**
Forecast	2014	120,000	102,000	85%	$ 2,956	$ 28.98	$ 28.50	$ 2,907,000.00
	2015	118,000	100,300	85%	$ 3,645	$ 36.34	$ 35.00	$ 3,510,500.00
	2016	118,000	100,300	85%	$ 3,727	$ 37.16	$ 35.00	$ 3,510,500.00

escalation rates

Co_ Code	Esc_ Code	Desc	Fiscal_ Year	Labor_ Rate	Non_Lab or_Rate
2200	G	GAS	2009	0.9073	0.9026
2200	G	GAS	2010	0.9307	0.9253
2200	G	GAS	2011	0.9549	0.9617
2200	G	GAS	2012	0.9765	0.9827
2200	G	GAS	2013	1	1.0000

Supplemental Workpapers for Workpaper 2IN002

Footnote No. 69

Pacific Gas and Electric Company

2014 General Rate Case Exhibit (PG&E-5), Chapter 7, Customer Energy Solutions Table 7-33

TABLE 7-33
Pacific Gas and Electric Company
2014 General Rate Case
Exhibit (PG&E-5), Chapter 7, Customer Energy Solutions
NGAT Unit Cost Expense Details

Line No.	Year	Number of Homes	% of Homes that receive a NGAT	NGAT Tests Performed (Column B x Column C)	Unit Cost ($)	Costs (other)	Total Cost ($000s) NGAT Tests x Unit Costs	Reference
1	**2012 Forecast**						3,228,000	WP 7-54 line 30
2	Test	125,000	64%	80,000	39.00	-	3,119,800	
	Calibration	-	-	-	-	Labor: $67 per hour x 1,078 = $72,250 Materials (mileage, tolls, per diem): $12,750	85,000	
3	Equipment/Administrative	-	-	-	-	Software updates: 431 units x $30 = $12,930 Filters: 862 x $7.75 = $6,670 Replacement: 3 units x $1,200 = $3,600	23,200	
4								
5	**2013 Forecast**						3,270,000	WP 7-54 line 34
6	Test	119,940	66%	79,160	40.23	-	3,185,000	
	Calibration	-	-	-	-	Labor: $67 per hour x 1,078 = $72,250 Materials (mileage, tolls, per diem): $12,750	85,000	
7								
8	**2014 Forecast**						3,800,000	WP 7-54 line 38
9	Test	119,940	66%	79,160	46.93	-	3,715,000	
	Calibration	-	-	-	-	Labor: $67 per hour x 1,078 = $72,250 Materials (mileage, tolls, per diem): $12,750	85,000	
10								

11 The number of NGAT tests is derived from the Home goal established in the Energy Savings Assistance proceeding (A.11-05-017, Appendix A) multiplied by the average number of homes that are eligible for infiltration measures (2012 – 2014 Decision is currently pending). Eligibility for infiltration measures is based on the statewide Installation Standards. PG&E uses historical data to establish the average % of homes that receive a NGAT. PG&E also considers any changes to the statewide Weatherization Installation Standards to drive this estimated percentage.

12 Calibration costs are derived from the (cost per hour in PG&E's contract with the vendor) x (average number of hours charged to complete the task). This cost also includes time and material charges. Historical data is used to determine the average number of hours, time and material costs and consider the calibration timeframe.

13 Unit cost for 2012 is based on costs negotiated and paid to a third party vendor.
Unit cost for 2013 and 2014 forecasts includes a combination of "make safe" costs and "test" costs. These dollars were combined since the new process of "make safe" is an additional action required if/when an appliance fails an NGAT test. The "test" cost is based on the previous year's forecast escalated by 3.1%. The "make safe" cost is based on costs negotiated and paid to the vendor.:
Because make safe is a new action required, PG&E made a business decision for the Gas Service organization to allocate budget for 2011-2013 "make safe" costs on an as needed basis. "Make safe" costs are covered in MWC GM in 2014.

	Year	Test Cost ($)	Test Cost Calculation	Make Safe Cost ($)	Unit Cost ($) (Column C + Column E)
14	2012	39.00	-	-	39.00
15	2013	40.21	2012 Unit Cost escalated by 2013 escalation rate ($39 x 3.1% = 1.21; $39 + 1.21 = $40.21)	0.02	40.23
16	2014	41.46	2013 Unit Cost escalated by 2014 escalation rate ($40.21 x 3.1% = $1.25; $40.21+1.25 =$41.46)	5.47	46.93

17 2012-2014 escalation is based on PG&E's best judgment.

Year	Escalation Rate
2012	3.1%
2013	3.1%
2014	3.1%

Supplemental Workpapers for Workpaper 2IN002

Footnote No. 72

California Public Utilities Code 382€

The entire document is available upon request.

382. (a) Programs provided to low-income electricity customers, including, but not limited to, targeted energy-efficiency services and the California Alternate Rates for Energy program shall be funded at not less than 1996 authorized levels based on an assessment of customer need.

(b) In order to meet legitimate needs of electric and gas customers who are unable to pay their electric and gas bills and who satisfy eligibility criteria for assistance, recognizing that electricity is a basic necessity, and that all residents of the state should be able to afford essential electricity and gas supplies, the commission shall ensure that low-income ratepayers are not jeopardized or overburdened by monthly energy expenditures. Energy expenditure may be reduced through the establishment of different rates for low-income ratepayers, different levels of rate assistance, and energy efficiency programs.

(c) Nothing in this section shall be construed to prohibit electric and gas providers from offering any special rate or program for low-income ratepayers that is not specifically required in this section.

(d) Beginning in 2002, an assessment of the needs of low-income electricity and gas ratepayers shall be conducted periodically by the commission with the assistance of the Low-Income Oversight Board. The assessment shall evaluate low-income program implementation and the effectiveness of weatherization services and energy efficiency measures in low-income households. The assessment shall consider whether existing programs adequately address low-income electricity and gas customers' energy expenditures, hardship, language needs, and economic burdens.

(e) The commission shall, by not later than December 31, 2020, ensure that all eligible low-income electricity and gas customers are given the opportunity to participate in low-income energy efficiency programs, including customers occupying apartments or similar multiunit residential structures. The commission and electrical corporations and gas corporations shall make all reasonable efforts to coordinate ratepayer-funded programs with other energy conservation and efficiency programs and to obtain additional federal funding to support actions undertaken pursuant to this subdivision.

These programs shall be designed to provide long-term reductions in energy consumption at the dwelling unit based on an audit or assessment of the dwelling unit, and may include improved insulation, energy efficient appliances, measures that utilize solar energy, and other improvements to the physical structure.

(f) The commission shall allocate funds necessary to meet the low-income objectives in this section.

Supplemental Workpapers for Workpaper 2IN002

Footnote No. 73

California Public Utilities Commission

Decision 12-08-044

The entire document is available upon request.

ALJ/KK2/gd2 **Date of Issuance 8/30/2012**

Decision 12-08-044 August 23, 2012

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of Southern California Edison Company (U338E) for Approval of its 2012-2014 California Alternate Rates for Energy (CARE) and Energy Savings Assistance Programs and Budgets.	Application 11-05-017 (Filed May 16, 2011)
And Related Matters.	Application 11-05-018 Application 11-05-019 Application 11-05-020

DECISION ON LARGE INVESTOR-OWNED UTILITIES' 2012-2014 ENERGY SAVINGS ASSISTANCE (ESA) (FORMERLY REFERRED TO AS LOW INCOME ENERGY EFFICIENCY OR LIEE) AND CALIFORNIA ALTERNATE RATES FOR ENERGY (CARE) APPLICATIONS

ORDER

IT IS ORDERED that:

1. The 2012-2014 Energy Savings Assistance Program and California Alternate Rates for Energy Program budgets of Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, and Southern California Gas Company are adopted as follows:

Adopted Budget Summary 2012-2014				
	ESAP			
Utility	2012	2013	2014	Cycle Total
PG&E	$150,982,212	$156,363,352	$161,862,111	$469,207,675
SCE	$72,461,946	$72,640,016	$72,736,631	$217,838,592
SDG&E	$21,716,006	$22,140,542	$22,515,618	$66,372,165
SoCalGas	$113,292,891	$117,559,854	$120,506,165	$351,358,910
Total	**$358,453,054**	**$368,703,763**	**$377,620,525**	**$1,104,777,343**
	CARE			
	2012	2013	2014	Cycle Total
PG&E	$675,989,667	$647,446,512	$620,716,512	$1,944,152,691
SCE	$342,557,000	$389,156,000	$429,212,000	$1,160,925,000
SDG&E	$79,108,350	$87,972,980	$89,010,739	$256,092,069
SoCalGas	$145,516,024	$145,870,266	$147,360,024	$438,746,314
Total	**$1,243,171,041**	**$1,270,445,759**	**$1,286,299,275**	**$3,799,916,075**

2. Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, and Southern California Gas Company shall treat at least 1 million households over the 2012-2014 budget cycle with the Energy Savings Assistance Program Budget approved in this decision.

3. Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, and Southern California Gas Company shall continue all their ongoing integration efforts among the Energy Savings Assistance Program, California Alternate Rates for Energy Program, Energy Efficiency programs, Demand Response programs, California Solar Initiative, and any other of the utility demand side programs.

(e) The Utilities shall take all reasonable actions to ensure that by no later than August 31, 2013, the Final Impact Evaluation Report must be posted on the Energy Division's Public Download Area website (http://www.energydataweb.com/).

113. Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, and Southern California Gas Company shall fund the new Impact Evaluation study from, not to exceed $600,000 in total combined expenditure; and we direct that it be funded by the Energy Savings Assistance Program budgets, with the four Utilities sharing costs with equal split: PG&E: 25%; SCE: 25%; SCG: 25%; and SDG&E: 25%.

114. Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas & Electric Company shall track and report customer unwilling/unable percentages of Energy Savings Assistance Program customers during the 2012-2014 budget cycle, including the reasons why customers are unwilling and/or unable to participate in the program during the 2012-2014 program cycle.

115. The proposals by Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas & Electric Company to increase the Energy Savings Assistance Program customers' unwillingness factor are rejected.

116. Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas & Electric Company shall continue to use, in their Energy Savings Assistance Program, the current 5% unwillingness factor for 2012-2014.

117. We approve the proposed continuation of the 15% disabled household Energy Savings Assistance Program penetration enrollment goal.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Workpaper: VARIOUS

Summary for Category: C. Customer Segment Markets

	In 2013$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	6,677	7,247	8,027	8,535
Non-Labor	1,642	1,882	2,551	2,956
NSE	0	0	0	0
Total	**8,319**	**9,129**	**10,578**	**11,491**
FTE	66.9	72.9	81.2	86.2

Workpapers belonging to this Category:

2IN003.000 CI-Energy Markets & Capacity Products

Labor	1,727	1,754	1,971	1,971
Non-Labor	74	107	107	107
NSE	0	0	0	0
Total	**1,801**	**1,861**	**2,078**	**2,078**
FTE	14.9	15.3	17.3	17.3

2IN004.000 CI-Segment Services

Labor	4,950	5,493	6,056	6,564
Non-Labor	1,568	1,775	2,444	2,849
NSE	0	0	0	0
Total	**6,518**	**7,268**	**8,500**	**9,413**
FTE	52.0	57.6	63.9	68.9

Note: Totals may include rounding differences.

Beginning of Workpaper
2IN003.000 - CI-Energy Markets & Capacity Products

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub 1. Energy Markets & Capacity Products
Workpaper: 2IN003.000 - CI-Energy Markets & Capacity Products

Activity Description:

The Energy Markets & Capacity Products organization provides account management services, natural gas storage services, operates the California Energy Hub (CEH), procures natural gas to maintain system integrity, supports intrastate transmission activities, and provides planning, studies, and recommendation for pipeline and compression facility changes to account for revised demand forecasts. The Energy Markets & Capacity Products organization consists of both utility shared services and non shared services. The historical costs and forecasts reflected in this workpaper are only for nonshared activities, and the costs related to shared services are provided in a different shared services workpaper for this organization. Nonshared specific activities include: Energy Markets Account Management, Storage Products and Hub Services, and Energy Markets Staff Support.

Forecast Explanations:

Labor - 5-YR Average

Labor costs in this organization were relatively flat for the recorded 5-years period. 5-year average forecasting methodology is used as the basis for TY2016 forecast to reflect continual support of core business functions and activities as well as for consistency with all other Customer Service - Information areas, with additional forecast adjustments to account for new expanded activities driven by regulatory/legislative initiatives.

Non-Labor - 5-YR Average

5-year average forecasting methodology is selected to reflect continual non-labor core business functions and typical periodic expenses. For consistency with the Energy Markets & Capacity Products forecast methodology, as well as for consistency with all other Customer Service - Information areas, 5-years average is used as the basis for this area's non-labor TY2016 forecast with no incremental adjustments.

NSE - 5-YR Average

Not applicable.

Summary of Results:

	In 2013$ (000) Incurred Costs							
	Adjusted-Recorded					Adjusted-Forecast		
Years	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labor	1,865	1,786	1,705	1,689	1,727	1,754	1,971	1,971
Non-Labor	151	117	93	99	74	107	107	107
NSE	0	0	0	0	0	0	0	0
Total	**2,015**	**1,903**	**1,798**	**1,788**	**1,801**	**1,861**	**2,078**	**2,078**
FTE	16.2	15.6	15.0	14.7	14.9	15.3	17.3	17.3

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 1. Energy Markets & Capacity Products
Workpaper: 2IN003.000 - CI-Energy Markets & Capacity Products

Forecast Summary:

In 2013 $(000) Incurred Costs										
Forecast Method		**Base Forecast**			**Forecast Adjustments**			**Adjusted-Forecast**		
Years		**2014**	**2015**	**2016**	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Labor	5-YR Average	1,754	1,754	1,754	0	217	217	1,754	1,971	1,971
Non-Labor	5-YR Average	107	107	107	0	0	0	107	107	107
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		**1,861**	**1,861**	**1,861**	**0**	**217**	**217**	**1,861**	**2,078**	**2,078**
FTE	5-YR Average	15.3	15.3	15.3	0.0	2.0	2.0	15.3	17.3	17.3

Forecast Adjustment Details:

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2014 Total	**0**	**0**	**0**	**0**	**0.0**	
2015	217	0	0	217	2.0	1-Sided Adj

Incremental labor and FTE costs for 1 Account Manager to support electric generation customer growth and 1 Market Advisor to support Energy Markets Staff Support growth above historic levels.

2015 Total	**217**	**0**	**0**	**217**	**2.0**	
2016	217	0	0	217	2.0	1-Sided Adj

Incremental labor and FTE costs for 1 Account Manager to support electric generation customer growth and 1 Market Advisor to support Energy Markets Staff Support growth above historic levels.

2016 Total	**217**	**0**	**0**	**217**	**2.0**	

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 1. Energy Markets & Capacity Products
Workpaper: 2IN003.000 - CI-Energy Markets & Capacity Products

Determination of Adjusted-Recorded (Incurred Costs):

	2009 ($000)	2010 ($000)	2011 ($000)	2012 ($000)	2013 ($000)
Recorded (Nominal $)*					
Labor	2,027	1,632	1,446	1,444	1,491
Non-Labor	171	123	105	113	89
NSE	0	0	0	0	0
Total	**2,198**	**1,756**	**1,551**	**1,556**	**1,580**
FTE	19.1	15.1	13.3	12.8	12.8
Adjustments (Nominal $) **					
Labor	-594	-218	-50	-22	-10
Non-Labor	-35	-15	-15	-15	-16
NSE	0	0	0	0	0
Total	**-629**	**-233**	**-65**	**-38**	**-26**
FTE	-5.5	-1.9	-0.5	-0.2	-0.1
Recorded-Adjusted (Nominal $)					
Labor	1,433	1,415	1,396	1,421	1,481
Non-Labor	136	108	90	98	74
NSE	0	0	0	0	0
Total	**1,569**	**1,523**	**1,486**	**1,519**	**1,554**
FTE	13.6	13.2	12.8	12.6	12.7
Vacation & Sick (Nominal $)					
Labor	259	247	232	228	246
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**259**	**247**	**232**	**228**	**246**
FTE	2.6	2.4	2.2	2.1	2.1
Escalation to 2013$					
Labor	173	124	77	40	0
Non-Labor	15	9	4	2	0
NSE	0	0	0	0	0
Total	**188**	**132**	**80**	**41**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2013$)					
Labor	1,865	1,786	1,705	1,689	1,727
Non-Labor	151	117	93	99	74
NSE	0	0	0	0	0
Total	**2,015**	**1,903**	**1,798**	**1,788**	**1,801**
FTE	16.2	15.6	15.0	14.7	14.8

* After company-wide exclusions of Non-GRC costs
** Refer to "Detail of Adjustments to Recorded" page for line item adjustments
Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 1. Energy Markets & Capacity Products
Workpaper: 2IN003.000 - CI-Energy Markets & Capacity Products

Summary of Adjustments to Recorded:

In Nominal $ (000) Incurred Costs					
Years	**2009**	**2010**	**2011**	**2012**	**2013**
Labor	-594	-218	-50	-22	-10
Non-Labor	-35	-15	-15	-15	-16
NSE	0	0	0	0	0
Total	**-629**	**-233**	**-65**	**-38**	**-26**
FTE	-5.5	-1.9	-0.5	-0.2	-0.1

Detail of Adjustments to Recorded:

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2009	-164	0	0	-1.7	CCTR Transf	To 2200-2061.000	CMAK20131027000303723
Cost alignment adjustment - Transfer commercial & industrial services labor and FTE costs for 2 Account Managers from CC 2200-0251 to CC 2200-2061 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2IN004.000)							
2009	-83	0	0	-0.8	CCTR Transf	To 2200-2060.000	CMAK20131027000420007
Cost alignment adjustment - Transfer commercial & industrial staff labor and FTE costs for 1 Market Advisor from CC 2200-0248 to CC 2200-2060 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2IN004.000)							
2009	0	-20	0	0.0	CCTR Transf	To 2200-0246.000	CMAK20131101005123917
Cost alignment adjustment - Transfer Customer Recognition non-labor expenses from CC 2200-0248 to CC 2200-0246 (Workpaper 2IN003.000 to Workpaper 2200-0246.000)							
2009	-114	0	0	-1.0	CCTR Transf	To 2200-0328.000	CMAK20131101093123157
Cost alignment adjustment - Transfer capacity products support labor and FTE costs for 1 manager from CC 2200-0249 to CC 2200-0328 due to reorganization (Workpaper 2IN003.000 to Workpaper 2200-0328.000)							
2009	-13	0	0	-0.1	1-Sided Adj	N/A	CMAK20131101101210847
One-sided adjustment - Cost exclusion to remove labor and FTE costs for Montebello storage expenses not supported by GRC							
2009	0	-15	0	0.0	1-Sided Adj	N/A	CMAK20131101101911930
One-sided adjustment - Cost exclusion to remove non-labor costs for Montebello storage expenses not supported by GRC							

Note: Totals may include rounding differences.

Area: CS - INFORMATION
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Category-Sub: 1. Energy Markets & Capacity Products
Workpaper: 2IN003.000 - CI-Energy Markets & Capacity Products

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2009	-160	0	0	-1.4	CCTR Transf	To 2200-0328.000	CMAK201311011 03128523
Cost alignment adjustment - Transfer capacity products support labor and FTE costs for 2 advisors from CC 2200-0327 to CC 2200-0328 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2200-0238.000)							
2009	-60	0	0	-0.5	CCTR Transf	To 2100-3433.000	CMAK201311020 92927077
Cost alignment adjustment - Transfer resource planning labor and FTE costs for 1 Manager from CC 2200-2037 to CC 2100-3433 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2100-3433.000)							
2009 Total	**-594**	**-35**	**0**	**-5.5**			
2010	-45	0	0	-0.4	CCTR Transf	To 2200-2061.000	CMAK201310251 91642403
Cost alignment adjustment - Transfer commercial & industrial services labor and FTE costs for 2 Account Managers from CC 2200-0251 to CC 2200-2061 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2IN004.000)							
2010	-23	0	0	-0.2	CCTR Transf	To 2200-2060.000	CMAK201310251 91737007
Cost alignment adjustment - Transfer commercial & industrial staff labor and FTE costs for 1 Market Advisor from CC 2200-0248 to CC 2200-2060 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2IN004.000)							
2010	-31	0	0	-0.3	CCTR Transf	To 2200-0328.000	CMAK201311011 04710070
Cost alignment adjustment - Transfer capacity products support labor and FTE costs for 1 manager from CC 2200-0249 to CC 2200-0328 due to reorganization (Workpaper 2IN003.000 to Workpaper 2200-0328.000)							
2010	-11	0	0	-0.1	1-Sided Adj	N/A	CMAK201311011 05604407
One-sided adjustment - Cost exclusion to remove labor and FTE costs for Montebello storage expenses not supported by GRC							
2010	0	-15	0	0.0	1-Sided Adj	N/A	CMAK201311011 05659557
One-sided adjustment - Cost exclusion to remove non-labor costs for Montebello storage expenses not supported by GRC							
2010	-45	0	0	-0.4	CCTR Transf	To 2200-0328.000	CMAK201311011 10149413
Cost alignment adjustment - Transfer capacity products support labor and FTE costs for 2 advisors from CC 2200-0327 to CC 2200-0328 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2200-0238.000)							

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 1. Energy Markets & Capacity Products
Workpaper: 2IN003.000 - CI-Energy Markets & Capacity Products

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2010	-63	0	0	-0.5	CCTR Transf	To 2100-3433.000	CMAK201311020 93157310
Cost alignment adjustment - Transfer Resource Planning labor and FTE costs for 1 Manager from CC 2200-2037 to CC 2100-3433 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2100-3433.000)							
2010 Total	**-218**	**-15**	**0**	**-1.9**			
2011	-10	0	0	-0.1	1-Sided Adj	N/A	CMAK201311011 40618400
One-sided adjustment - Cost exclusion to remove labor and FTE costs for Montebello storage expenses not supported by GRC.							
2011	0	-15	0	0.0	1-Sided Adj	N/A	CMAK201311011 40719713
One-sided adjustment - Cost exclusion to remove non-labor costs for Montebello storage expenses not supported by GRC.							
2011	-40	0	0	-0.4	CCTR Transf	To 2100-3433.000	CMAK201311020 93409367
Cost alignment adjustment - Transfer Resource Planning labor and FTE costs for 1 Manager from CC 2200-2037 to CC 2100-3433 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2100-3433.000)							
2011 Total	**-50**	**-15**	**0**	**-0.5**			
2012	-10	0	0	-0.1	1-Sided Adj	N/A	CMAK201311011 45145157
One-sided adjustment - Cost exclusion to remove labor and FTE costs for Montebello storage expenses not supported by GRC.							
2012	0	-15	0	0.0	1-Sided Adj	N/A	CMAK201311011 45218460
One-sided adjustment - Cost exclusion to remove non-labor costs for Montebello storage expenses not supported by GRC.							
2012	-12	0	0	-0.1	CCTR Transf	To 2100-3433.000	CMAK201311020 93735103
Cost alignment adjustment - Transfer Resource Planning labor and FTE costs for 1 Manager from CC 2200-2037 to CC 2100-3433 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2100-3433.000)							
2012 Total	**-22**	**-15**	**0**	**-0.2**			

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 1. Energy Markets & Capacity Products
Workpaper: 2IN003.000 - CI-Energy Markets & Capacity Products

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2013	-10	0	0	-0.1	1-Sided Adj	N/A	CMAK20140219144659283
One-sided adjustment - Cost exclusion to remove labor and FTE costs for Montebello storage expenses not supported by GRC.							
2013	0	-16	0	0.0	1-Sided Adj	N/A	CMAK20140219144718650
One-sided adjustment - Cost exclusion to remove non-labor costs for Montebello storage expenses not supported by GRC.							
2013 Total	**-10**	**-16**	**0**	**-0.1**			

Note: Totals may include rounding differences.

Supplemental Workpapers for Workpaper 2IN003.000

Supplemental Workpapers for Workpaper 2IN003

Footnote No. 77 & 83

Southern California Gas Company

California Energy Hub

For Your Business

- Small and Medium Business
- Commercial Business
- Industrial and Manufacturing
- Agriculture
- Builder Services

- Billing and Payments
- Energy Savings
- Trade Pro Directory
- Resources, Training and Seminars
- Gas Prices
- Rates and Tariffs
- Natural Gas Industry
  - Air Quality Services
  - Backbone Transportation
  - Capacity Trading
  - Envoy
  - Gas Acquisition
  - Gas Quality Studies
  - **Hub Services**
  - Natural Gas Suppliers
  - Power Generation
  - Self-Generation Incentives Program
  - Producer Receipt Points
  - Storage Services
- Technology and Investments
- Service Request
- Help Center

California Energy Hub

California Energy Hub® offers several services for Southern California's natural gas market. These include traditional hub services such as natural gas parking and loaning, natural gas storage, and gas sales from CPUC-authorized projects.

Park and Loan

Effective July 2008, Southern California Gas Company (SoCalGas) established new tariff G-PAL. This tariff offers, when available, interruptible gas parking and loaning services to any qualified creditworthy party. Gas parking is the temporary storage of gas on the SoCalGas system and gas loaning is the temporary lending of gas from the SoCalGas system. Rates for this service are negotiated on an individual transaction basis based on current market conditions. The negotiated rate includes the transmission of gas between the citygate and the storage fields. Prerequisites for this service are an executed Master Services Contract (MSC) and an MSC Schedule O.

As required by D.07-12-019, SoCalGas will post on a weekly basis at its EBB: net hub position, net volumes parked and loaned, withdrawal schedules for all hub volumes parked and repayment schedules for all hub volumes loaned.

- G-PAL Tariff *(PDF)*
- Operations Park and Loan Services Agreement *(PDF)*
- Operational Hub Positions *(PDF)*

Natural Gas Storage

SoCalGas is the nation's largest natural gas distribution utility, providing reliable, safe and efficient natural gas service to a popula of more than 13 million. Underground storage of natural gas plays a vital role in b cing the region's energy supply and demand. SoCalGas owns and operates 4 rground storage facilities located at Aliso Canyon, Honor Rancho, Goleta and P Del Rey. These facilities play a vital role in balancing the region's energy suppl d demand.

FEEDBACK

Of our total 136 billion cubic feet (Bcf) of storage capacity, 83 Bcf is allocated to our Core residential, small industrial and commercial customers. About 4 Bcf of space is used for system balancing. The remaining capacity is available to other customers.

Benefits of underground storage include imbalance protection, curtailment protection and price arbitrage. Storage can be used to avoid imbalance penalties from monthly or daily balancing violations. To avoid the suspension of gas supplies from a curtailment event, storage will move customers with firm withdrawal service back to the number 7 level of the curtailment queue. Storage can be used to take advantage of the swings in gas prices to generate profits or reduce costs. Storage can also help customers maintain non-core rate eligibility, eliminate the hassle that is associated with other back up fuel systems, and help keep plants running and delivery schedules on track.

- 2014 Storage Season -- *Currently offering capacity for April 2014*
- Storage Transactions -- *As required by D.07-12-019, SoCalGas will post all storage transactions on its EBB within one business day of execution.*
- Interruptible Storage Injection and Withdrawal Auction -- *Storage holders may improve the flow of their interruptible storage injection and withdrawal rights by participating in a web-based auction to bid up the priority of their interruptible rights. These auctions are conducted on a regular basis to establish the priority of interruptible rights for the Next Day strip as defined on ICE.*

Gas Sales from CPUC-Authorized Projects

California Energy Hub conducts gas sales from the decommissioned Montebello gas storage field pursuant to CPUC Decision No. 01-06-081 dated June 28, 2001. California Energy Hub also conducts gas sales from other cushion gas projects. When required, SoCalGas reworks wells in existing storage fields creating additional storage inventory and releasing cushion gas for sale.

SoCalGas has also received CPUC authorization to engage in exploration and production activities for natural gas at its storage properties. Proceeds from the sale of natural gas into the California marketplace will be shared with ratepayers and will contribute to further exploration activities at the properties.

Contact for Further Information on California Energy Hub Services

Gwoon Tom, Storage Products Manager
(213) 244-3692

Did you know?

You can pay your SoCalGas bill and schedule appliance service orders online through My Account. Sign up today for 24/7 access to your account.

gtom@semprautilities.com

Jimmy Yen, Account Manager
(213) 244-5466
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Elvia Ortiz, Storage Products Advisor
(213) 244-5779
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Supplemental Workpapers for Workpaper 2IN003

Footnote No. 78

U.S. Energy Information Administration

Annual Energy Outlook 2014 with projections to 2040

The entire document is available upon request.

DOE/EIA-0383(2014) | April 2014

Annual Energy Outlook 2014

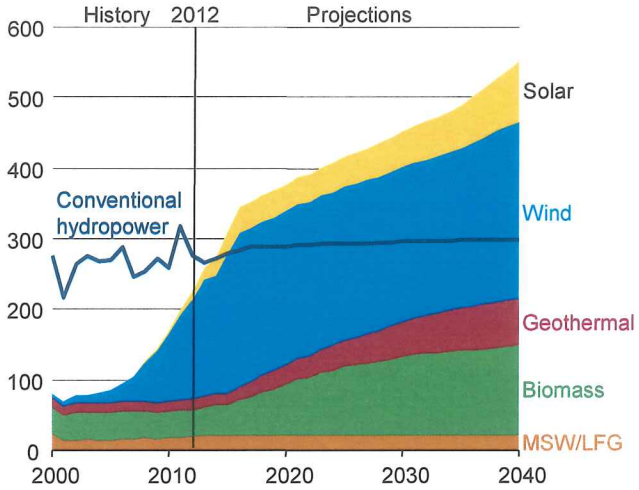
with projections to 2040

Independent Statistics & Analysis
U.S. Energy Information Administration

Renewable generation

Total generation from wind, solar, and other renewables surpasses hydropower

Figure MT-37. Renewable electricity generation by type, all sectors, in the Reference case, 2000-40 (billion kilowatthours)



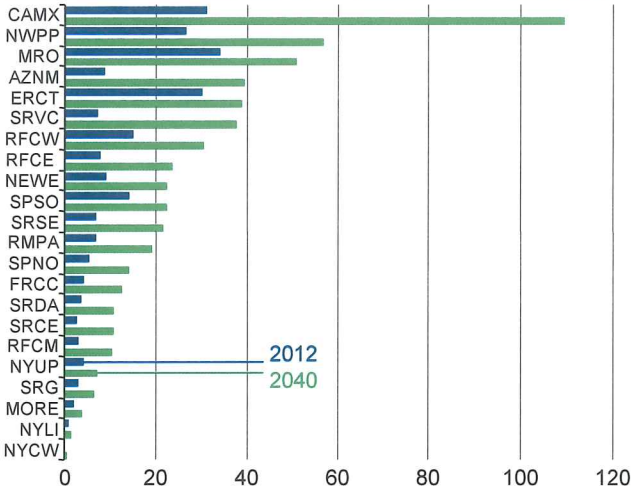
Total renewable electricity generation grows by 1.9%/year on average in the Reference case, from 502 billion kWh in 2012 to 851 billion kWh in 2040. Nonhydropower renewables, averaging 3.2%/year growth, account for nearly all of the growth, with their total surpassing hydropower (the previous leader of renewable generation) in 2014 and accounting for about two-thirds of all renewable generation in 2040 (Figure MT-37).

Solar energy is the fastest-growing source of renewable generation, increasing by 7.5%/year from 2012 to 2040, almost exclusively as a result of increased photovoltaic capacity in both the electric power (central-station) and end-use (customer-sited) sectors. Wind generation grows by an average of 2.0%/year but provides the largest absolute increase in renewable generation. From 2012 to 2016, wind power developers take advantage of the existing federal PTC, which requires plants to be under construction by the end of 2013 to qualify.

Geothermal power is the second-fastest-growing source of renewable electricity generation in the Reference case, increasing from less than 16 billion kWh in 2012 to 67 billion in 2040—a 5.4% average annual growth rate. Biomass generation also grows significantly, increasing by an average of 4.4%/year from 2012 to 2040, primarily as a result of increased use of co-firing technology in the electric power sector in the near- to mid-term. Co-firing is encouraged by state-level policies and increasing regional cost-competitiveness with coal. In the long run, the growth of biomass generation is supported by increased capacity at dedicated biomass plants in the electric power sector, as well as combined heat and power plants in the industrial sector.

California leads renewable electricity generation growth

Figure MT-38. Regional nonhydropower renewable electricity, including end-use generation, in the Reference case, 2012 and 2040 (billion kilowatthours)



In the AEO2014 Reference case, nonhydropower renewable generation increases from 2012 to 2040 in all modeled electricity regions (for a map of the regions and definition of acronyms, see Appendix F). Its growth is faster in some regions than in others, and the penetration in the generation mix and resulting increases in generation vary substantially among regions (Figure MT-38).

Regional growth in nonhydropower renewable generation is mainly driven by three factors: state RPS, availability of renewable energy resources, and cost competiveness with fossil fuel technologies. Factors such as electricity demand growth, non-RPS policies (such as net metering), and electricity prices also affect the rate of growth, which tends to be strongest in regions where a combination of factors is in place.

The WECC California (CAMX) region accounts for both the highest absolute level of nonhydropower renewable generation in 2040 and the largest growth from 2012 to 2040, which is supported by an aggressive RPS, availability of solar, wind, and geothermal resources, and relatively high electricity prices. The AZNM (Arizona, New Mexico, and Nevada) and SRVC (Virginia, North Carolina, and South Carolina) regions show the next-highest increases in nonhydropower renewable generation from 2012 to 2040. In the AZNM region, growth is supported by mandatory RPS standards, above-average electricity demand growth, and the availability of solar and wind resources. Although Virginia and South Carolina do not have mandatory policies in place, the SRVC region has robust biomass and solar resources and relatively high fossil fuel prices.

Supplemental Workpapers for Workpaper 2IN003

Footnote No. 79

California Gas and Electric Utilities

2012 California Gas Report

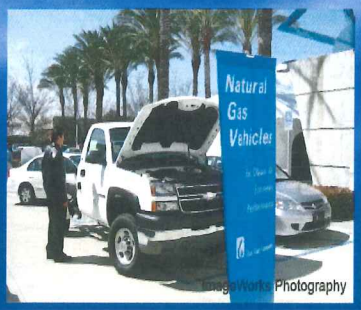
The entire document is available upon request.

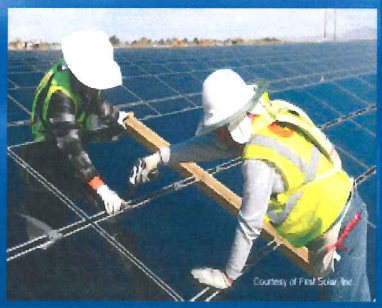
2012 California Gas Report






Prepared by the California Gas and Electric Utilities



July 2012

FUTURE GAS SYSTEM IMPACTS RESULTING FROM INCREASED RENEWABLE GENERATION, AND LOCALIZED OR DISTRIBUTED GENERATION RESOURCES

Since utility system operators must balance electrical demand with appropriate generation sources on a real-time basis, most system operators rely on "dispatchable" resources that can respond quickly to changes in demand. The challenge with renewable resources is that while they can provide energy, they are not always totally predictable nor are they often considered controllable resources.

In the future, the increase in renewable generation in the state will definitely reduce the total amount of natural gas usage, but it is also expected that the future increases in renewable electric generation will increase the daily and hourly load forecast error associated with operation of natural gas fueled electric generation system. California is currently on track to meet a 33% Renewable Portfolio Standard by 2020 which will almost double the amount of renewable generation in the next eight years from the levels of 2008. In addition, the Governor has indicated an interest in significantly increasing the amount of smaller (less than 20 megawatts) generation in the state primarily with renewable or efficient technology. All this renewable energy will displace some of the natural gas currently being used to generate electricity in California but the reduction will not be proportional to the amount of renewable generation energy due to the intermittent nature of this renewable generation. The intermittent nature of renewable generation is likely to cause the electric system to rely more heavily on natural gas fired electric generation for providing the ancillary services (load following, ramping, and quick starts) needed to balance the electric system in the short term until other technologies can mature.

It is expected that solar and wind generating units will provide the major percentage of the new renewable electric generation in the years ahead with much of the smaller incremental renewable power coming from solar photovoltaic (PV) installations because solar generation costs have declined rapidly in the past few years and solar has siting advantages especially in the urban areas. Due to this expansion of renewable resources there may be an increased need for rapid response generators which could be available to follow load and the intermittent nature of these new renewables.

The impact of renewable generation resources that will be added into the California generation resource mix is that the system is likely to experience increased gas demand volatility for the electric generators that will be asked to meet the ancillary service needs in the state. In many months of the year the variability of wind is significant and in months that have significant cloud formation, or overcast conditions, the solar PV units may also have increased generation variability. The uncertainty in day-ahead gas demands will likely cause increased gas system inventory fluctuations. The gas system will therefore need to be flexible enough to handle such fluctuations with minimal disturbance to the delivery of the gas to other entities.

As noted previously, many recent studies have indicated that wind resources do not totally displace fossil fuels on a one-for-one basis. Therefore, since gas fired generation is the marginal resource in most hours the amount of gas consumed for integrating more renewables will definitely increase. The magnitude of that increase is still being studied, but recent analysis by the CAISO has shown some measurable increases of the capacity factors of the combined

cycle and peaking natural gas units are expected in the future. There will undoubtedly be higher daily fluctuations of gas usage in the future especially on days when clouds materialize that were not forecast so the gas system will need to be able to accommodate such operations.

There may also be challenges in integrating new renewable generating facilities into both local and regional transmission grids. [1] The electric transmission system was built largely on a utility-by-utility basis to transport power from large central power stations to load centers. In most cases, the electric power generating plants were located within the utility service territory, with adjunct capabilities to sell power "off grid" to neighboring utilities or transmission-only utilities. The transportation of large quantities of remotely-generated, small scale and intermittent power supplies across long distances was not anticipated during the original construction of these systems, nor was this scenario anticipated in the development of state and federal regulatory pricing schemes. Such a change in the delivery of electric power will also add variability to the entire electric market which will most likely increase the variability of electric system generation and may increase the daily, hourly, and real time forecast error of the gas delivery systems. Lastly, smaller generators placed on the distribution systems of utilities were never envisioned in the past years, especially of the magnitude now anticipated. This, in effect, will also increase the variability of conventional gas fired or fossil generation and will necessitate higher quality forecasting methods in the future to minimize the deviations in the gas delivery needs.

The challenge of incorporating intermittent resources into the utility system is currently being addressed in several ways. Currently utility planners are anticipating the use of increased cycling fossil plants, pumped hydroelectric facilities, price responsive demand reducing programs, and distributed generation at load centers to handle much of the variability in gas demand. In addition, advances in forecasting wind availability, for example, will be critical in the facilitation of higher penetrations of wind resources on the electric system while attempting to minimize the gas delivery volatility. If forecasting can be improved then less spinning reserves and other ancillary services will be required. Also, a broader interconnection to the regional grid may offset the intermittent nature of a resource and alleviate some of the operational obstacles to integration so emphasis on shorter scheduling time increments between electric control areas would be very beneficial. However in the short term, or next five years, there is still a need to have sufficient resources available, most likely fossil resources, to balance the grid at times of renewable intermittency.

[1] *Linking Alternative and Distributed Energy Production to Electric Grid* Draft 12/28/2006. Prepared for the United States Department of Agriculture by Booz Allen and Hamilton. This source information has been modified to reflect conditions in California.

Supplemental Workpapers for Workpaper 2IN003

Footnote No. 80

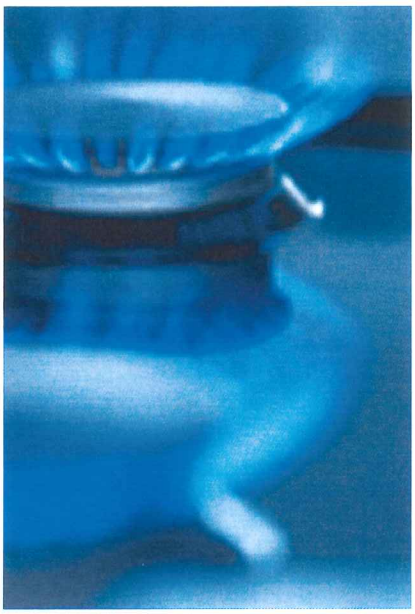
California Energy Commission

California Natural Gas Data and Statistics

Energy ALMANAC
The California ENERGY COMMISSION

California Natural Gas Data and Statistics

Overview



Demand for natural gas falls mainly into four sectors - residential, commercial, industrial, and electric power generation. Very small amounts are also used for vehicle fuel, and for production and transmitting natural gas to consumers. While the supply of natural gas in the United States and production in the Lower 48 states has increased greatly since 2008, California produces little, and imports 90 percent of natural gas. Most imports are delivered via interstate pipelines from the Southwest, Rocky Mountains, and Canada. California, which is located at the end of the southwestern interstate pipeline system, is vulnerable to disruptions in supply and fluctuations in transportation prices. California has increased both the number of pipeline connections to sources outside the state and gas storage capacity. These measures provide access to multiple supply sources and help mitigate the impact of disruption in supply or price spikes on any one supply basin or pipeline.

Dispatchable natural gas-fired generation is the dominant source of electricity and accounted for 43 percent of all generation in California in 2012. As California and the rest of the nation strive to integrate a higher percentage of renewable-derived energy into their electricity generation portfolio, the role of natural gas will likely change. In addition, the closure of San Onofre Nuclear Generation Station and retirement of once-through cooling generation facilities in California will require replacement generation, some of which will likely come from natural gas-fired generation.

Facts & Stats

- California Natural Gas Overview
- California Monthly Natural Gas Report (Analysis)
- Energy Conversion Table - Electricity & Natural Gas

Popular Energy Commission Reports

- 2012 Natural Gas Market Trends
- 2011 Natural Gas Market Assessment: Outlook

Consumption and Demand

- California Energy Consumption Database Management System
- California Residential Natural Gas Consumption, 1967-2007
- U.S. Natural Gas Consumption (US EIA)
- Per Capita Natural Gas Use by State (EIA)
- Average Per Capita Natural Gas Consumption by State 2006
- Natural Gas Consumption By

Pipeline Companies

- California Gas Transmission (Subsidiary of PG&E)
- El Paso Natural Gas
- Kern River Gas Transmission Company
- Questar Southern Trails
- Sempra International
- Southwest Gas Corporation
- Transwestern

Natural Gas Utilities

Supplemental Workpapers for Workpaper 2IN003

Footnote No. 81 & 82

U.S. Energy Information Administration

Review of Emerging Resources: U.S. Shale Gas and Shale Oil Plays

The entire document is available upon request.

U.S. Energy Information Administration

Review of Emerging Resources: U.S. Shale Gas and Shale Oil Plays

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Independent Statistics & Analysis
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Washington, DC 20585

Review of Emerging Resources: U.S. Shale Gas and Shale Oil Plays

Background

The use of horizontal drilling in conjunction with hydraulic fracturing has greatly expanded the ability of producers to profitably recover natural gas and oil from low-permeability geologic plays—particularly, shale plays. Application of fracturing techniques to stimulate oil and gas production began to grow rapidly in the 1950s, although experimentation dates back to the 19th century. Starting in the mid-1970s, a partnership of private operators, the U.S. Department of Energy (DOE) and predecessor agencies, and the Gas Research Institute (GRI) endeavored to develop technologies for the commercial production of natural gas from the relatively shallow Devonian (Huron) shale in the eastern United States. This partnership helped foster technologies that eventually became crucial to the production of natural gas from shale rock, including horizontal wells, multi-stage fracturing, and slick-water fracturing.[1] Practical application of horizontal drilling to oil production began in the early 1980s, by which time the advent of improved downhole drilling motors and the invention of other necessary supporting equipment, materials, and technologies (particularly, downhole telemetry equipment) had brought some applications within the realm of commercial viability. [2]

The advent of large-scale shale gas production did not occur until Mitchell Energy and Development Corporation experimented during the 1980s and 1990s to make deep shale gas production a commercial reality in the Barnett Shale in North-Central Texas. As the success of Mitchell Energy and Development became apparent, other companies aggressively entered the play, so that by 2005, the Barnett Shale alone was producing nearly 0.5 trillion cubic feet of natural gas per year. As producers gained confidence in the ability to produce natural gas profitably in the Barnett Shale, with confirmation provided by results from the Fayetteville Shale in Arkansas, they began pursuing other shale plays, including Haynesville, Marcellus, Woodford, Eagle Ford, and others.

Although the U.S. Energy Information Administration's (EIA) National Energy Modeling System (NEMS) and energy projections began representing shale gas resource development and production in the mid-1990s, only in the past 5 years has shale gas been recognized as a "game changer" for the U.S. natural gas market. The proliferation of activity into new shale plays has increased dry shale gas production in the United States from 1.0 trillion cubic feet in 2006 to 4.8 trillion cubic feet, or 23 percent of total U.S. dry natural gas production, in 2010. Wet shale gas reserves increased to about 60.64 trillion cubic feet by year-end 2009, when they comprised about 21 percent of overall U.S. natural gas reserves, now at the highest level since 1971.[3] Oil production from shale plays, notably the Bakken Shale in North Dakota and Montana, has also grown rapidly in recent years.

To gain a better understanding of the potential U.S. domestic shale gas and shale oil resources, EIA commissioned INTEK, Inc. to develop an assessment of onshore Lower 48 States technically recoverable shale gas and shale oil resources. This paper briefly describes the scope, methodology, and key results of the report and discusses the key assumptions that underlie the results. The full report prepared by INTEK is provided in Attachment A. The shale gas and shale oil resource assessment contained in the INTEK report and summarized here was incorporated into the Onshore Lower 48 Oil and Gas Supply Submodule (OLOGSS) within the Oil and Gas Supply Module (OGSM) of NEMS to project oil and natural gas production for the *Annual Energy Outlook 2011* (*AEO2011*). EIA also anticipates using the assessment to inform other analyses and to provide a starting point for future work.

Scope and results

The INTEK shale resources report estimates shale gas and shale oil resources for the undeveloped portions of 20 shale plays that have been discovered (Table 1). Eight of those shale plays are subdivided into 2 or 3 areas, resulting in a total of 29 separate resource assessments. The total of 750 trillion cubic feet shown in Table 1 excludes three additional components of resources: proven reserves, inferred reserves in actively developed areas and un-discovered resources as estimated by the U.S. Geological Survey (USGS). The map in Figure 1 shows the location of the shale plays in the Lower 48 States.

Eighty-six percent of the total 750 trillion cubic feet of technically recoverable shale gas resources identified in Table 1 are located in the Northeast, Gulf Coast, and Southwest regions, which account for 63 percent, 13 percent, and 10 percent of the total, respectively. In the three regions, the largest shale gas plays are the Marcellus (410.3 trillion cubic feet, 55 percent of the total), Haynesville (74.7 trillion cubic feet, 10 percent of the total), and Barnett (43.4 trillion cubic feet, 6 percent of the total).

Table 1 also summarizes the INTEK shale report's assessment of technically recoverable shale oil resources, which amount to 23.9 billion barrels in the onshore Lower 48 States. The largest shale oil formation is the Monterey/Santos play in southern California, which is estimated to hold 15.4 billion barrels or 64 percent of the total shale oil resources shown in Table 1. The Monterey shale play is the primary source rock for the conventional oil reservoirs found in the Santa Maria and San Joaquin Basins in southern California. The next largest shale oil plays are the Bakken and Eagle Ford, which are assessed to hold approximately 3.6 billion barrels and 3.4 billion barrels of oil, respectively.

Other average properties were estimated for the Monterey/Santos shale. These include the depth, thickness, porosity, and total organic content for the shale. The values are provided in Table 58.

Table 58 Average General Properties for the Monterey/Santos Shale Play

	Active
Depth (ft)	11,250
Thickness (ft)	1,875
Porosity (%)	11
Total Organic Content (% wt)	6.5

Active Companies

The companies, along with their net acreage who are currently holding leases within the Monterey/Santos shale play as of 2010, are listed in Table 59.

Table 59 Monterey/Santos Lease Holders

Company	Net Acreage
Berry Petroleum	6,500
National Fuel Gas Company (NFG)	14,000
Occidental Petroleum Company (Oxy)	873,000
Plains Exploration and Production	70,000
Venoco	158,000

Based upon these lease holdings, the total active area is calculated at 1,121,500 net acres (1,752 square miles).

Well Costs

Plains Exploration and Production Company reports an average gross well cost in 2010 of $1.2 million dollars per well. Oxy reports cost for vertical well ranging from $2 to $2.5 million and horizontal well costs ranging from $5 to 7 million. They also report finding and development costs between $8 and 18 dollars/BOE, depending upon the field.

Current Activities

Oxy Corporation has undertaken a 4-year development program and remains the largest leaseholder within the Monterey/Santos play. Seneca Resources/ NFG first went into production in February 2010 and have completed a 14 well development program. In 2010, Venoco completed their 1st horizontal well in the Monterey Basin and plan to increase their net acreage.

USGS Comparison

This play has not been evaluated by USGS.

Representative Type Curve

Figure 33 provides a representative type curve reported by Oxy Corporation for a vertical well, horizontal well, and for the Elk Hills Area "shale" vertical well within the Monterey/Santos shale play.

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Footnote No. 86

Southern California Gas Company

Omnibus

Omnibus

The Omnibus Decision (07-12-019) allows SoCalGas/SDG&E to implement a range of revisions to their natural gas operations and offer new services for their core and unbundled storage services. Information on the new services are listed below and described in more detail in subsequent sections.

5th Nomination Cycle

Effective for April 1, 2009, a 5th nomination cycle (Intraday 3) will be available to help customers balance their deliveries with their usage. SoCalGas will only accept firm nominations related to the injection of existing flowing supplies into a storage account or for firm nominations relating to the withdrawal of gas in storage to meet a customer's usage for that gas day. This will be available each day, including OFO days.

Intraday 3 nominations must be submitted by 9:00 p.m. (PCT) on the flow date. A 15 minute deadline extension will be honored, if requested. Physical flow of this gas will be effective at 11:00 p.m. (PCT).

TOP

Interruptible Storage Injection and Withdrawal

Beginning on April 1, 2009, customers may bid for interruptible storage injection and withdrawal rights on a daily basis. By obtaining interruptible injection rights, a storage customer may increase the likelihood of being allocated a portion of unused storage injection capacity when an Operational Flow Order has been declared. In addition, interruptible withdrawal rights may be used during curtailments, and during the Winter Balancing 70% balancing regime, when interruptible storage withdrawal limits are imposed. Interruptible withdrawals are not counted toward the minimum delivery requirements while the Winter Delivery Rules are in effect. Interruptible storage nominations will remain unrestricted during normal operating conditions.

All storage customers will be given access to a new web site which will allow them to bid on interruptible rights for any flow date. The bid deadline will be prior to flow, at a time specified on the site. Bidders will be able to see the current bids - volume and price - in an open bid format. After bidding is closed, a price-based priority queue will be established to allocate the use of interruptible rights. The priority queue will be displayed on the web site after the bidding is closed, and each customer will be able to see their position in the queue. Customers will only pay for the actual interruptible volume that is scheduled.

TOP

Secondary Market for Storage Rights

The Omnibus Decision authorized SoCalGas to establish new tariff Schedule G-SMT. This tariff allows customers holding firm storage rights to release all or a portion of those rights to any creditworthy party in the secondary market through SoCalGas' Electronic Bulletin Board (EBB). Until the full implementation of this service via the EBB, scheduled for late 2009, SoCalGas will offer a manual processing of assignments of firm storage rights. The assignment can consist of all or part of a customer's storage rights and/or all or part of the remaining contract term. Pre-requisites for this service are an executed Master Service Contract (MSC) and an executed MSC Schedule I.

Upon full implementation of the G-SMT tariff SoCalGas will post on its EBB a summary of the completed secondary market transactions, listing releasing party, acquiring party, amount of capacity, transaction price, and term of the release. These transactions will be posted the next business day following the completion of sale. SoCalGas will also post on the EBB all contracted firm storage capacity and the available unsubscribed storage capacity for sale. This information will be updated on a daily basis.

G-TBS Storage Transaction Postings

SoCalGas will post all G-TBS storage transactions on its EBB within one business day of execution, including the counterparty name, quantity of storage services contracted, contract prices and contract term.

TOP

Expanded Imbalance Trading Period

Effective April 1, 2009, the imbalance trading window will start on the 25th and end on the last day each month, except for February which starts on February 23.

- January 25-31
- February 23-28 (or 29)
- March 25-31
- April 25-30
- May 25-31
- June 25-30
- July 25-31
- August 25-31
- September 25-30
- October 25-31
- November 25-30
- December 25-31

TOP

Enhanced Imbalance Trading Functionality

The Imbalance Trading functionality in the Envoy system will be enhanced to allow customers to post Open offers for an imbalance position. Customers will be able to bid on imbalance position offers and the seller will be able to select the winning bidder from the offers made. Available late 2009.

TOP

New ESP Balancing and Storage

Core Aggregation Transportation (CAT) ~ Storage

CAT storage is a part of the overall SoCalGas/SDG&E core storage requirements for winter reliability. The cost for storage is included in core customers' transportation rates. As a result of the Omnibus decision, there will be several changes to the current storage processes for both SoCalGas and SDG&E Energy Service Providers (ESPs) serving CAT customers. These changes will be effective April 1, 2009.

- Each ESP will be assigned a prorata share of the total core inventory, injection and withdrawal rights, broken down by customer class percentages and the core's cold year demand forecast.
- The storage rights will be calculated on March 16, 2009 for the period April 1, 2009 through March 31, 2010. These rights will change only if the customer load changes by at least 10%.
- ESPs will manage their CAT storage rights through the Envoy EBB.
- ESPs will have one storage account for each utility they serve.
- ESPs may use their rights to inject or withdraw gas for their CAT storage throughout the year.
- ESPs may use imbalance trading as a means to move gas into or out of CAT storage.
- ESPs may use the Secondary Market to sell unused rights.
- Sale of CAT storage rights is recallable by SoCalGas and any offers placed on the secondary trading platform will be indentified as recallable.
- ESPs will continue to have month-end storage minimums for the months of November through March to meet SoCalGas' storage requirements for core service reliability as well as to maintain minimum storage quantities to meet Abnormal Peak Day (APD) and cold year requirements.
- If an ESP does not meet minimum winter storage targets, the utilities will divert flowing supplies from the ESP's deliveries and recall any necessary injection rights that may have been sold.

ESP Statements

Under Omnibus, the ESP statements from SoCalGas and SDG&E will show usage for the **prior** month.

Transition Period for SoCalGas ESPs

March 2009

- During the March imbalance trading period for January, ESPs must trade their storage by 3/28/2009.
- ESPs with storage inventory above their inventory rights must withdraw the difference during the March trading period.

April 2009

- ESPs will receive February invoice excluding storage.
- ESPs will begin using Envoy on April 1st to manage inventory, injection, withdrawal, storage rights.

May 2009

- ESPs will receive a both a March and April invoice. The March invoice will exclude storage information. The April invoice will include storage.

Transition Period for SDG&E ESPs

March 2009

- SDG&E will automatically manage storage for ESPs
- ESPs will be required to have a zero balance in storage by 03/31/09.

April 2009

- ESPs will begin using Envoy on April 1st to manage inventory, injection/withdrawal, storage rights.
- The Daily Contract Quantity (DCQ) will replace the Minimum Daily Quantity (MinDQ) and Maximum Daily Quantity (MDQ).

TOP

Shipper Imbalance

A shipper imbalance can occur when at the end of a scheduling day gas deliveries made to the SoCalGas system do not match quantities that were delivered off-system for a particular shipper. Off-system services are determined by the amount of physical gas flowing on system and are by displacement only. The shipper imbalance can only occur on the Off-System Delivery Contract (OSD).

Over Delivery Shipper Imbalance:

An over delivery shipper imbalance would occur when gas originating from a pipeline, a City Gate Pool, or Storage is confirmed on an OSD during the SoCalGas confirmation process off to PG&E but during on-system allocation process, deliveries from PG&E are reduced to SoCalGas. As a result the gas confirmed on the OSD cannot get scheduled to PG&E thereby creating an Over Delivery Shipper Imbalance.

Under Delivery Shipper Imbalance:

An under delivery shipper imbalance would occur when gas originating from a pipeline, a City Gate Pool, or Storage is confirmed during the SoCalGas confirmation process off to PG&E and is allocated but during a re-allocation, supplies from another pipeline are reduced. This would cause the gas being delivered to the OSD to be reduced; however, the gas being delivered to PG&E can no longer be reduced. This results in an Under Delivery Shipper Imbalance.

Curing a Shipper Imbalance:

The Shipper Imbalance will be tracked in the Shipper Imbalance tracking account G99. All Over Delivery Shipper Imbalances will be identified as positive amounts and all Under Delivery Imbalances will be identified as negative amounts in the G99 tracking account. The Shipper Imbalance will be cured by the OSD owner making a nomination into the G99 if they are trying to cure an Under Delivery Imbalance or a nomination out of the G99 in order to cure an Over Delivery Imbalance. SoCalGas will notify the shipper of its imbalance after the gas day is over. The shipper should clear this imbalance as soon as operationally feasible. Nominations can be added to Envoy during cycles 1 thru 4. The SoCalGas Gas Scheduler will confirm the nomination in ENVOY as either the supply or the market.

TOP

Hub Services – G-PAL

Effective July 2008, SoCalGas established new tariff G-PAL. This tariff offers interruptible gas parking and loaning services to any qualified creditworthy party. Gas parking is the temporary storage of gas on the SoCalGas system and gas loaning is the temporary lending of gas from the SoCalGas system. Rates for this service are negotiated on an individual transaction basis based on current market conditions. Pre-requisite's for this service is an executed Master Services Contract (MSC) and MSC Schedule O.

As required by D.07-12-019, SoCalGas will post on a weekly basis at its EBB: net hub position, net volumes loaned and parked, withdrawal schedules for all hub volumes parked and repayment schedules for all hub volumes loaned.

TOP

Tariffs for New Services

OMNIBUS Decision

http://www.socalgas.com/regulatory/documents/a-06-08-026/omnifinal.pdf

Advice Letter 3818-A with tariffs

http://www.socalgas.com/regulatory/tariffs/tm2/pdf/3818-A.pdf

TOP

Presentations

- Imbalance Trading (PDF)
- Interruptible Storage Service (PDF)
- Interruptible Storage Service – *Updated* (PDF)
- Scheduling (PDF)
- Scheduling – *Revised* (PDF)
- ESP (CAT) Changes (PDF)
- Secondary Storage Trading (PDF)

Presentation from informational Omnibus webinar of July 23, 2009

- OMNIBUS Phase II - Agenda, Imbalance Trading and Scheduling changes
- Secondary Storage Rights Trading
- Storage Trading Deadlines
- FAR Trading Update
- Storage Nomination and Trading Authorization Form

TOP

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Footnote No. 88

National Geographic Daily News

New "Flexible" Power Plants Sway to Keep Up with Renewables

National Geographic Daily News

New "Flexible" Power Plants Sway to Keep Up with Renewables

California's El Segundo Energy Center is the second power plant in the United States to be outfitted with technology that allows it to ramp up or down quickly with natural gas to accommodate a shifting supply of renewable energy.

PHOTOGRAPH BY GIL HIDALGO

By Josie Garthwaite and Christina Nunez
For National Geographic

PUBLISHED OCTOBER 31, 2013

Shifting rapidly with the weather, the supply of renewable power can be quite changeable. Most power plants, however, are anything but. Unable to ramp up or down quickly and efficiently, conventional facilities lack the ability to capitalize on a growing influx of wind and solar power to the grid.

Now the technology behind power plants is shifting in response. In California, two new "flex" plants have been built to swoop in and fill the gap with natural gas when renewable resources fall short of demand. One of the plants, the modernized El Segundo Energy Center, opened in September near Los Angeles. The project, which is operated by NRG Energy and uses technology from Siemens, is only the second of its kind in commercial operation nationwide; the first opened last year in Lodi, near Stockton. (See related quiz: "What You Don't Know About Electricity.")

Employing innovations that make the most of combined-cycle technology, in which exhaust heat captured from the burning of natural gas drives a steam turbine, El Segundo's two units can each ramp up to 150 megawatts within 10 minutes and reach a maximum output of 275 megawatts apiece in less than an hour. In contrast, old gas-fired steam boilers still in use at the site take up to 12 hours to warm up, and NRG typically fires them up in the evening to be ready for the next day's power needs.

The new units are helping NRG replace less efficient steam boilers at El Segundo after nearly four decades of operation. Using roughly 30 percent less natural gas per megawatt than the old units it replaced, the system can generate enough electricity for more than 400,000 homes.

Tweaking the Tried and True

As renewable sources of energy like wind and solar begin to make up a larger portion of the power supply, providers are being challenged to ensure that electricity is always available when the wind doesn't gust as powerfully as expected or cloud cover crimps solar production. New or updated plants that can start, stop, or throttle up and down quickly and efficiently—all without breaking down or coughing up excess emissions—might hold one of the keys to accommodating these fluctuating renewables, says Debra Lew, a senior engineer for the National Renewable Energy Laboratory whose research focuses on integrating wind and solar into power systems. "This is what you're going to need in a high wind and solar future," she said. (See related blog post: "A Promising Outlook for Solar Energy Forecasting.")

At the same time, this type of power plant is not an entirely new class of technology that would require utilities to step far outside their comfort zones, notes Steven

Minnihan, senior research analyst for the market research firm Lux Research. "Rather, Siemens has made noteworthy improvements on the tried-and-true combined-cycle gas turbine," Minnihan said. "They blend the familiarity and ease of conventional natural gas with *some* of the flexibility that an energy storage system can offer."

The system does not respond to fluctuating needs as quickly as emerging energy storage technologies, he said, which can capture wind energy generated at night, for example, and make it available as needed when demand picks up during the day. But "Siemens has familiarity on its side," Minnihan said. (See related story: "Too Much Wind? Save It in Underground Volcanic Rock Reservoirs.")

Siemens is not alone in promoting new gas turbines: Alstom, Mitsubishi and General Electric (GE) have all rolled out new generation systems in recent years with an emphasis on flexibility. All of them feature upgrades that go beyond the efficiencies of combined-cycle technology: By adjusting internal controls, improving specific components, and reworking architecture, manufacturers are aiming to provide fast-start turbines that can adjust output quickly without sacrificing performance.

"In the past, there was always a compromise between having highly efficient gas turbine combined-cycle plants, or very flexible gas turbine power plants," said James Donohue, senior marketing manager with GE Power & Water. "We really think that with this technology, you don't have to make that choice anymore."

The technology also addresses concerns that conventional plants' efficiency could be degraded by renewables, erasing the benefits of moving away from fossil fuel. "There had been some myths that had said emissions actually got worse because of cycling impact," said NREL's Lew, referring to the impact of ramping generators up and down to smooth out fluctuations in wind and solar. (See related story: "High Voltage DC Breakthrough Could Boost Renewable Energy.")

Her research with NREL suggests this is not the case in the West—the emissions avoided by harnessing solar and wind instead of burning fossil fuels more than make up for the efficiency lost by running a conventional plant at less than full throttle. But it remains true that utilities must cycle their plants more frequently to accommodate high levels of wind and solar energy, and that this results in some additional maintenance and operations costs.

Rising Intermittency, Changing Needs

Pressure to build a system where renewables and fossil fuels can complement one another on the grid is especially strong in California, where an ambitious mandate calls for renewables to make up at least one third of the total power supply by 2020. Similarly, New Jersey, which ranks behind California as one of the nation's top states for solar installations, recently broke ground on an $845 million, 700-megawatt natural gas facility in Woodbridge.

But new power plant designs like these can help to fill gaps well beyond the United States, too. "They represent an easy and cost-effective way to manage rising intermittency globally," said Minnihan. (See related story: "Japan Solar Energy Soars, But Grid Needs to Catch Up.")

GE, which is providing its FlexEfficiency turbines for the New Jersey facility, hoped to debut its technology in Turkey, touting it two years ago as a world first. That project is still caught in financing discussions, but another flex plant in France is moving forward and expected to come online by early 2016, around the same time as the Woodbridge plant.

Donohue said GE has also had orders for its flex turbines in South America, Japan, and Saudi Arabia. "Over the past several years, there's been more and more of a realization of the fact that with the intermittency of renewables, in order to have a reliable and stable grid, you need to have dispatchable power like combined-cycle power plants to make up for that intermittency," he said.

Donohue said GE is still selling plenty of conventional gas turbines as countries such as Algeria and Nigeria catch up technologically. "The largest order that we ever had in our business recently in Algeria was not [flex] technology. It's kind of an old standard machine that ten years ago was the machine in Europe," Donohue said. But as Algeria develops, he said, "I would bet that in five to ten years, they'll move to this FlexEfficiency technology." In other places, like China and Brazil, Donohue said, competition from coal has held back demand for flex gas plants.

Around the world, new power plants will play a key role in the integration of renewables onto the grid, but NREL's Lew pointed out that another important step will be adapting older power plants to meet society's changing needs. "There's a huge existing fleet out there that's still going to be used because it's been paid for or nearly paid for, and there might be some simple things that can be done to make them more flexible."

This story is part of a special series that explores energy issues. For more, visit The Great Energy Challenge.

Supplemental Workpapers for Workpaper 2IN003

Footnote No. 89

California's Clean Energy Future

Once-Through Cooling Phase-Out

Once-Through Cooling Phase-Out

Section 316(b) of the Clean Water Act requires U.S. Environmental Protection Agency to ensure that the location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts. Since 1972, states have enforced this requirement on a case-by-case basis in the absence of a specific federal rule. California parties expressed concerns that federal regulations were inadequate and should be addressed by a clearer, more prescriptive California rule.

The State Water Resources Control Board (Water Board) first described a California regulatory approach in March 2008 when it published a scoping document entitled *Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling* to implement Section 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b).

The California ISO (ISO) and five state agencies (California Energy Commission, California Public Utilities Commission, California Coastal Commission, State Lands Commission and California Air Resources Board) worked closely with the Water Board to develop a policy that would achieve water quality goals while ensuring reliability of California's electricity grid.

On May 4, 2010, the Water Board approved a once-through cooling (OTC) policy that included many grid reliability recommendations made by the ISO as well as a joint implementation proposal developed by the Energy Commission, Public Utilities Commission and ISO. The policy was approved by the Office of Administrative Law on September 27, 2010 and became an effective regulation on October 1, 2010.

Nineteen power plants in California were affected by the regulation. Of those 19, 16 totaling about 17,500 MW are in the ISO balancing authority area and 3 are in the Los Angeles Department of Water & Power (LADWP) balancing area. Compliance dates for plants named in the regulation range from 2010 to 2024. These plants are critical for system and local reliability and provide ever-increasing ancillary services needed for integration of renewable resources. Plants located in the Los Angeles Basin with plans to repower their facilities face additional regulatory challenges due to the lack of air credits in the South Coast Air Basin.

The state agencies mentioned previously are working with the Water Board to implement the regulation. Key recent and upcoming activities include the following:

- April 1, 2011 – Generator owners and operators provided detailed implementation compliance plans to the Water Board.
- September 29, 2011 – Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) provided a report to the Water Board asserting that additional information was needed from generators to enable a complete review of their intentions, and that information updates should be expected on a recurring bases until compliance was achieved.
- October 1, 2011 – The Review Committee for Nuclear Fueled Power Plants (RCNFPP) provides a report for public comment detailing the scope of the special studies.

- March 31, 2012 – First annual SACCWIS report to the Water Board. The Water Board will consider the recommendations and make modifications to the regulation, if appropriate, based on grid reliability.
- March 31, 2012 – For some units the SACCWIS will make recommendations to the Water Board by March 31, 2012 regarding generator requested compliance date changes. The Water Board will subsequently make a determination taking into account the generator proposals and the SACCWIS recommendations.
- October 1, 2013 – The Review Committee for Nuclear Fueled Power Plants (RCNFPP) provides to the Water Board a final report and comments detailing results of the special studies.

At the April 8, 2011 Statewide Advisory Committee on Cooling Water Intake Structures meeting, the Water Board staff provided an overview of the implementation plans received on April 1, 2011. Implementation plans were received from owners for all 14 fossil plants[1] representing a total of 49 units. Four of the units propose retirement while the remaining propose variations of compliance. Of the 45 units, 31 will comply under Track 1 (closed cycle cooling) while 14 will comply under Track 2 (comparable to Track 1 using operational or structural controls, or both). With regard to meeting compliance dates, 36 of 49 units expect to meet their compliance date (this includes the 4 retirements); 13 have requested extensions ranging from 2 to 16 years. Of the 13 requesting extensions, 11 are Track 1 and 2 are Track 2.

The values shown in the table below are drawn from the most recent April 2011 filings of owner implementation plans. This table shows each facility and unit, their mandated compliance date, the owner proposed compliance implementation date, the existing Net Qualifying Capacity (NQC) and compliance status. The status is “In Compliance” if the unit has met its requirements, “Ahead Schedule” if the owner implementation date is earlier than the Water Board date, “On Schedule” if the Water Board date is equal to the owner implementation date, “Caution” if deemed at risk by owner implementation schedule response, or “Behind Schedule” if the implementation date is after the Water Board date.

In addition, the table below reflects compliance date changes for the LADWP units (Haynes, Harbor, Scattergood) adopted as amendments to the policy by the State Water Board on July 19, 2011.

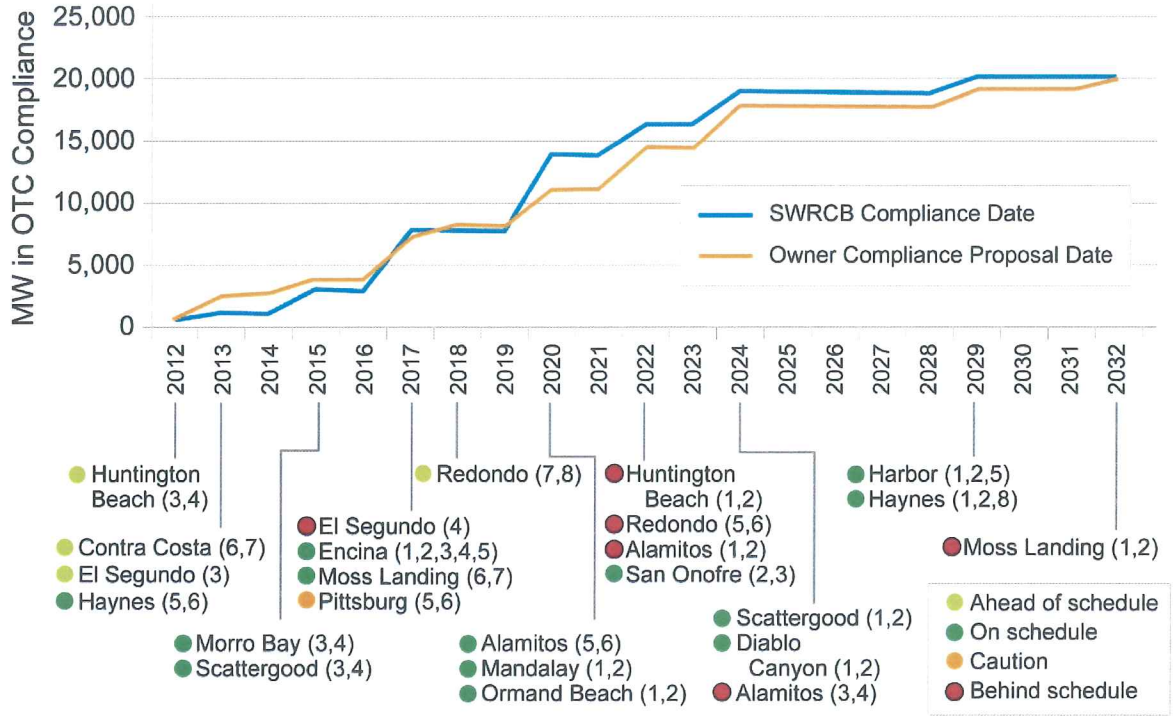
[1] Nineteen (19) power plants in California were impacted by the regulation. Seventeen (17) of the nineteen power plants are fossil and two (2) are nuclear. Three (3) of the fossil plants are already in compliance (repowered or shut down), so the remaining fourteen (14) were required to submit implementation plans.

Table 1: OTC implementation schedules

Facility & Units	SWRCB Compliance Date	Owner proposed Compliance Date	NQC	Compliance Status
Humboldt Bay 1, 2	31-Dec-10	31-Jul-10	163	In Compliance
Potrero 3	1-Oct-11	28-Feb-11	206	In Compliance
South Bay	31-Dec-11	N/A	296	In Compliance
Haynes 5,6	31-Dec-13	31-Dec-13	535	On Schedule
El Segundo 3	31-Dec-15	1-Jul-13	335	Ahead of Schedule
El Segundo 4	31-Dec-15	31-Dec-17	335	Behind Schedule
Morro Bay 3, 4	31-Dec-15	31-Dec-15	650	On Schedule
Scattergood 3,4	31-Dec-15	31-Dec-15	450	On Schedule
Encina 1,2,3,4,5	31-Dec-17	31-Dec-17	946	On Schedule
Contra Costa 6, 7	31-Dec-17	30-Apr-13	674	Ahead of Schedule
Pittsburg 5,6	31-Dec-17	31-Dec-17	629	Caution
Moss Landing 1,2	31-Dec-17	31-Dec-32	1020	Behind Schedule
Moss Landing 6,7	31-Dec-17	31-Dec-17	1510	On Schedule
Huntington Beach 1,2	31-Dec-20	31-Dec-22	452	Behind Schedule
Huntington Beach 3,4	31-Dec-20	31-Dec-12	452	Ahead of Schedule
Redondo 5,6	31-Dec-20	31-Dec-22	354	Behind Schedule
Redondo 7,8	31-Dec-20	31-Dec-18	989	Ahead of Schedule
Alamitos 1,2	31-Dec-20	31-Dec-22	350	Behind Schedule
Alamitos 3,4	31-Dec-20	31-Dec-24	668	Behind Schedule
Alamitos 5,6	31-Dec-20	31-Dec-20	993	On Schedule
Mandalay 1,2	31-Dec-20	31-Dec-20	430	On Schedule
Ormond Beach 1,2	31-Dec-20	31-Dec-20	1516	On Schedule
San Onofre 2,3	31-Dec-22	31-Dec-22	2246	On Schedule
Scattergood 1,2	31-Dec-24	31-Dec-24	367	On Schedule
Diablo Canyon 1,2	31-Dec-24	31-Dec-24	2240	On Schedule
Harbor 1, 2, 5	31-Dec-29	31-Dec-29	229	On Schedule
Haynes 1,2,8	31-Dec-29	31-Dec-29	1019	On Schedule

The bar graph below illustrates the variance between the Water Board policy and the owners' proposed dates noted in the April 2011 implementation plans.

Figure 1: OTC compliance status



OTC Phase out Tracks:

Track 1: Reduction of intake flow rate at each power-generating unit to a level that can be attained with a closed-cycle wet cooling system.[2] A minimum of 93% reduction is required compared to the design intake flow rate.

Track 2: If compliance with Track 1 is not feasible, the impingement mortality and entrainment[3] for the facility as a whole must be reduced to a comparable level to Track 1, using operational or structural controls, or both.

[2] *Closed-cycle wet cooling system* – Refers to a cooling system, which functions by transferring waste heat to the surrounding air through the evaporation of water, thus enabling the reuse of a smaller amount of water several times to achieve the desired cooling effect. The only discharge of wastewater is from periodic blow-down for the purpose of limiting the buildup of concentrations of materials in excess of desirable limits established by best engineering practice.

[3] Most facilities that obtain cooling water from surface water sources use some method of primary screening to prevent large objects from being drawn through the cooling system, where they may clog or damage sensitive equipment. These screens typically have mesh panels with slot sizes ranging from 3/8 inch to 1 inch and are rotated periodically or removed to clean off any debris, including aquatic organisms. **Impingement** occurs when organisms are trapped against the screen as a result of the force of the intake water and are unable to escape. **Entrainment** is the action of drawing smaller objects through the entire cooling water system, including the pumps and condenser tubes, and discharging them along with the cooling water and other plant wastes.

References:

Discharge Policy: October 1, 2010 Letter from Linda S. Adams, Secretary for Environmental Protection, California State Water Resources Control Board to Lester Snow, Secretary for Resources, California Resources Agency Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, http://www.swrcb.ca.gov/water_issues/programs/ocean/cwa316/docs/secres100510.pdf including Attachment A to that letter (dated September 27, 2010), or separately, the revised attachment (dated October 1, 2010) http://www.swrcb.ca.gov/water_issues/programs/ocean/cwa316/docs/policy100110.pdf

Supplemental Workpapers for Workpaper 2IN003

Footnote No. 90

Southern California Edison

Docket Nos. 50-361 and 50-362 Certification of Permanent Cessation of Power Operations San Onofre Nuclear Generating Station Units 2 and 3 Letter

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

June 12, 2013

Peter T. Dietrich
Senior Vice President & Chief Nuclear Officer

10 CFR 50.82(a)(1)(i)

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Subject: **Docket Nos. 50-361 and 50-362**
Certification of Permanent Cessation of Power Operations
San Onofre Nuclear Generating Station Units 2 and 3

Dear Sir or Madam:

Pursuant to 10 CFR 50.82 (a) (1) (i), Southern California Edison (SCE) hereby certifies that it has permanently ceased power operation of the San Onofre Nuclear Generating Station, Units 2 and 3 effective June 7, 2013.

On that date, SCE publicly announced its decision to permanently shut down both Unit 2 and Unit 3 and filed its announcement with Securities and Exchange Commission on Form 8-K, pursuant to the requirements of the Securities Exchange Act of 1934.

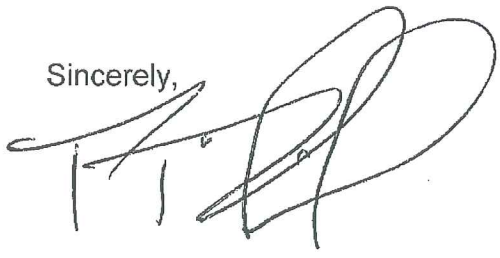
There are no new commitments contained in this letter.

If you have any questions regarding this matter, please feel free to contact Mr. Mark E. Morgan, Licensing Lead, at 949-368-6745.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on JUNE 12, 2013.
(Date)

Sincerely,



cc: A. T. Howell III, Regional Administrator, NRC Region IV
R. Hall, NRC Project Manager, San Onofre Units 2 and 3
B. Benney, NRC Project Manager, San Onofre Units 2 and 3
G. G. Warnick, NRC Senior Resident Inspector, San Onofre Units 2 and 3

P.O. Box 128
San Clemente, CA 92672
(949) 368-6255 PAX 86255
Fax: (949) 368-6183
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Supplemental Workpapers for Workpaper 2IN003

Footnote No. 91

California Public Utilities Commission

Long Term Procurement Plan

Long Term Procurement Plan

What it Does: Reviews and approves plans for the utilities to purchase energy. Establishes policies and utility cost recovery for energy purchases. Ensures that the utilities maintain a set amount of energy above what they estimate they will need to serve their customers (called a reserve margin), and implements a long-term energy planning process.

The Basics: Under Assembly Bill (AB) 57 (PU Code 454.5), passed in 2002 after the energy crisis, the investor-owned utilities (IOUs) resumed electricity procurement. Every two years, the PUC holds a Long Term Procurement Plan (LTPP) proceeding to review and adopt the IOUs' ten-year procurement plans. The LTPP proceeding evaluates the utilities' need for new fossil-fired resources and establishes rules for rate recovery of procurement transactions. It also serves as the "umbrella" proceeding to consider, in an integrated fashion, all of the Commission's EAP loading order resource policies and programs.

- 2012 LTPP
- 2010 LTPP
- 2008 LTPP
- 2006 LTPP
- 2004 LTPP
- Historical development of the Long Term Procurement Plan process

Last Modified: 6/18/2014

2012 LTPP

The LTPP Rulemaking provides a biennial review of the IOUs' procurement review process, established pursuant to AB57. The IOUs submit long-term procurement plans (LTPPs) that serve as the basis for utility procurement and comprehensively integrate all Commission decisions from all procurement related proceedings. The 2012 LTP, R1203014, proceeding follows R1005006, the 2010 LTPP.

On March 22, 2012, the Commission issued the Order Instituting Rulemaking (OIR) which established a multi-track proceeding to address several different issues. Some tracks will run concurrently while others will be in sequence, and any interim decisions or rulings from one track may influence future activities in the other tracks:

- Track I which will focus on the long-term overall need for local reliability resources;
- Track II which will focus on the long-term overal need for system reliability resources, including variability/renewable integration; and
- Track III which will focus on "bundled" utility procurement.

See more information about the 2012 LTPP Rulemaking:

- Tools and Spreadsheets
- LTPP History

Last Modified: 9/5/2012

Supplemental Workpapers for Workpaper 2IN003

Footnote No. 92

U.S. Energy Information Administration

West Texas Intermediate Spot Price of Oil

The entire document is available upon request.

U.S. Energy Information Administration

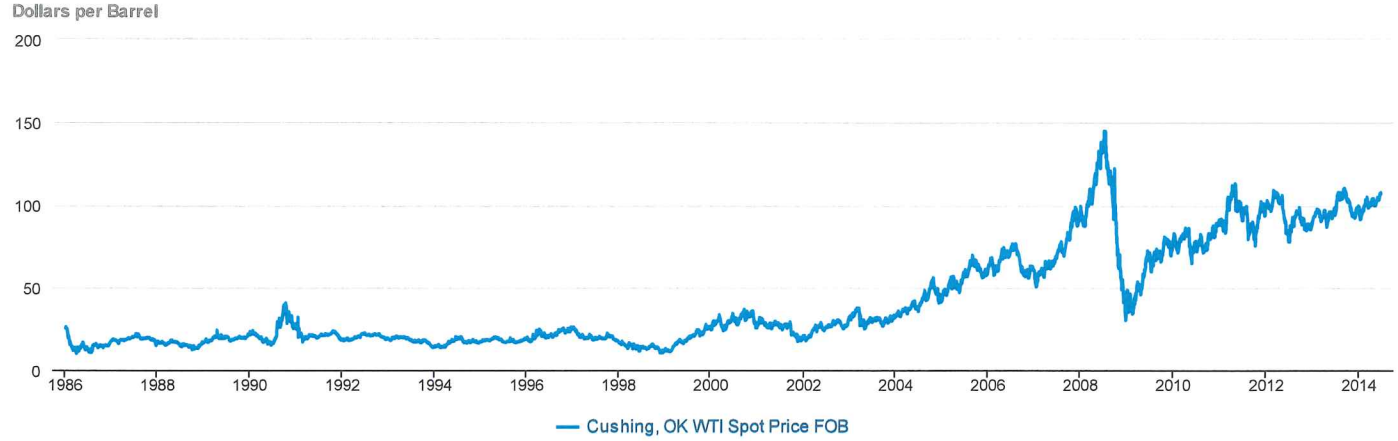
PETROLEUM & OTHER LIQUIDS

OVERVIEW | DATA | ANALYSIS & PROJECTIONS | GLOSSARY › | FAQS ›

View History: Daily Weekly Monthly Annual

Download Data (XLS File)

Cushing, OK WTI Spot Price FOB



THOMSON REUTERS

Chart Tools

no analysis applied

Cushing, OK WTI Spot Price FOB (Dollars per Barrel)

Week Of	Mon	Tue	Wed	Thu	Fri
1985 Dec-30 to Jan- 3				25.56	26.00
1986 Jan- 6 to Jan-10	26.53	25.85	25.87	26.03	25.65
1986 Jan-13 to Jan-17	25.08	24.97	25.18	23.98	23.63
1986 Jan-20 to Jan-24	21.33	20.61	20.25	19.93	19.45
1986 Jan-27 to Jan-31	20.87	19.45	19.61	19.58	18.95
1986 Feb- 3 to Feb- 7	17.42	15.58	16.28	16.60	17.70
1986 Feb-10 to Feb-14	16.78	16.28	15.74	16.43	16.03
1986 Feb-17 to Feb-21		14.70	15.08	14.13	13.63
1986 Feb-24 to Feb-28	14.68	14.68	14.62	14.05	13.23
1986 Mar- 3 to Mar- 7	11.98	11.98	12.03	13.13	12.24
1986 Mar-10 to Mar-14	12.94	13.23	14.05	12.60	12.55
1986 Mar-17 to Mar-21	13.28	14.03	13.25	12.75	13.95
1986 Mar-24 to Mar-28	12.20	12.43	12.03	11.35	
1986 Mar-31 to Apr- 4	10.25	11.13	11.35	11.70	12.75
1986 Apr- 7 to Apr-11	14.39	12.83	13.00	13.45	13.63
1986 Apr-14 to Apr-18	12.94	12.72	11.50	11.75	11.88
1986 Apr-21 to Apr-25	12.48	13.13	13.70	13.65	14.23
1986 Apr-28 to May- 2	13.34	13.63	13.38	13.80	14.65
1986 May- 5 to May- 9	14.32	14.43	15.13	15.70	15.83
1986 May-12 to May-16	15.75	15.65	15.53	15.68	16.08
1986 May-19 to May-23	17.13	16.18	15.53	16.04	16.95
1986 May-26 to May-30		15.10	14.65	14.50	14.30
1986 Jun- 2 to Jun- 6	13.80	13.35	13.15	13.21	12.73
1986 Jun- 9 to Jun-13					

Beginning of Workpaper
2IN004.000 - CI-Segment Services

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub 2. Segment Services
Workpaper: 2IN004.000 - CI-Segment Services

Activity Description:

Segment Services provides account management to large commercial, industrial, government, small electric generation, and refineries customer segments, as well as newly expanded services to include small and medium business customers, builders, and residential segments. This organization also includes supporting staff that oversees policy and other regulatory support for issues affecting these customer segments.

Forecast Explanations:

Labor - 5-YR Average

The Segment Services organization adopted a 5-year average forecast methodology with adjustments for expanded segments growth. This forecasting methodology was selected because the business functions and responsibilities of this organization has remained stable, permitting a 5-year average forecast methodology to reduce common anomalies in the basis for the forecast. This forecast selection is also consistent with all other Customer Service - Information areas, with adjustments to account for specific new program growth and newly added responsibilities.

Non-Labor - 5-YR Average

The Segment Services organization adopted a 5-year average forecast methodology with adjustments for expanded segments growth. This forecasting methodology was selected because the business functions and responsibilities of this organization has remained stable, permitting a 5-year average forecast methodology to reduce common anomalies in the basis for the forecast (for example, from fluctuations in the business cycle, cyclical membership expenses, outreach events, etc.) This forecast selection is also consistent with all other Customer Service - Information areas.

NSE - 5-YR Average

Not applicable.

Summary of Results:

	In 2013$ (000) Incurred Costs							
	Adjusted-Recorded					Adjusted-Forecast		
Years	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labor	5,921	5,395	5,350	5,223	4,950	5,493	6,056	6,564
Non-Labor	1,430	1,556	1,300	1,416	1,568	1,775	2,444	2,849
NSE	0	0	0	0	0	0	0	0
Total	**7,351**	**6,951**	**6,650**	**6,640**	**6,519**	**7,268**	**8,500**	**9,413**
FTE	60.7	56.6	57.1	55.3	52.0	57.6	63.9	68.9

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 2. Segment Services
Workpaper: 2IN004.000 - CI-Segment Services

Forecast Summary:

In 2013 $(000) Incurred Costs										
Forecast Method		**Base Forecast**			**Forecast Adjustments**			**Adjusted-Forecast**		
Years		**2014**	**2015**	**2016**	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Labor	5-YR Average	5,368	5,368	5,368	125	688	1,196	5,493	6,056	6,564
Non-Labor	5-YR Average	1,454	1,454	1,454	321	990	1,395	1,775	2,444	2,849
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		**6,822**	**6,822**	**6,822**	**446**	**1,678**	**2,591**	**7,268**	**8,500**	**9,413**
FTE	5-YR Average	56.3	56.3	56.3	1.3	7.6	12.6	57.6	63.9	68.9

Forecast Adjustment Details:

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2014	125	0	0	125	1.3	1-Sided Adj

Residential Services: Adjustment to annualize (make whole) labor functions attributed to new activities added partial year 2013 ($29), as well as capture new incremental labor costs ($96) for 1 Clean Energy Builder Services market advisor.

2014	0	174	0	174	0.0	1-Sided Adj

Residential Services: Incremental non-labor costs for Residential Market Services' contract labor, market research, web changes, communication and promotional materials.

2014	0	147	0	147	0.0	1-Sided Adj

Segment Services: Incremental non-labor costs required to develop combined heat and power marketing tools.

2014 Total	**125**	**321**	**0**	**446**	**1.3**	
2015	591	0	0	591	6.3	1-Sided Adj

Residential Services: Adjustment to annualize (make whole) labor functions attributed to new activities added partial year 2013 ($29), and $562 for new incremental labor costs for Residential Market Services (2 project managers), and Clean Energy Builder Services (2 advisors, 1 project manager, and 2 interns).

2015	0	690	0	690	0.0	1-Sided Adj

Residential Services: Incremental non-labor ($350) for Residential Market Services' contract labor, market research, web changes, communication and promotional materials, and ($340) for Clean Energy Builder Services' contract labor, market research, web changes, communication and promotional materials.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 2. Segment Services
Workpaper: 2IN004.000 - CI-Segment Services

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2015	75	0	0	75	0.8	1-Sided Adj
Segment Services: Incremental costs for 1 technical advisor in Staff Support for accelerated development and installation of combined heat and power technology.						
2015	0	300	0	300	0.0	1-Sided Adj
Segment Services: Incremental non-labor costs required to develop combined heat and power marketing tools, online self-CHP evaluation tool, technology and service brochures, technical seminars, and establishing industry presence at industry associations and conventions.						
2015	22	0	0	22	0.5	1-Sided Adj
Segment Services: Incremental labor costs for 1 intern to support Staff functions.						
2015 Total	**688**	**990**	**0**	**1,678**	**7.6**	
2016	0	63	0	63	0.0	1-Sided Adj
Small/Medium Business Support Services: Incremental non-labor costs associated with expanded support of small commercial & industrial markets, which consists of marketing materials, consultant studies, and trade shows/traveling expenses.						
2016	591	0	0	591	6.3	1-Sided Adj
Residential Services: Adjustment to annualize (make whole) labor functions attributed to new activities added partial year 2013 ($29), and $562 for new incremental labor costs for Residential Market Services (2 project managers), and Clean Energy Builder Services (2 advisors, 1 project manager, and 2 part-time interns).						
2016	0	690	0	690	0.0	1-Sided Adj
Residential Services: Incremental non-labor ($350) for Residential Market Services' contract labor, market research, web changes, communication and promotional materials, and ($340) for Clean Energy Builder Services' contract labor, market research, web changes, communication and promotional materials.						
2016	75	0	0	75	0.8	1-Sided Adj
Segment Services: Incremental costs for 1 technical advisor in Staff Support for accelerated development and installation of combined heat and power technology.						
2016	0	300	0	300	0.0	1-Sided Adj

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 2. Segment Services
Workpaper: 2IN004.000 - CI-Segment Services

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
Segment Services: Incremental non-labor costs required to develop combined heat and power marketing tools, online self-CHP evaluation tool, technology and service brochures, technical seminars, and establishing industry presence at industry associations and conventions.						
2016	508	0	0	508	5.0	1-Sided Adj
Small/Medium Business Support Services: Incremental labor costs associated with expanded support of small commercial & industrial markets (1 Business Manager, 4 Account Representatives).						
2016	0	50	0	50	0.0	1-Sided Adj
Segment Services: Incremental O&M non-labor costs associated with education and outreach to support the new My Business Account web application.						
2016	22	0	0	22	0.5	1-Sided Adj
Segment Services: Incremental labor costs for 1 intern to support Staff functions.						
2016	0	200	0	200	0.0	1-Sided Adj
Residential Services: Incremental non-labor communication costs to support expanded Customer Service Field Safety Check outreach.						
2016	0	92	0	92	0.0	1-Sided Adj
Residential Service: Incremental non-labor communication costs to support expanded Customer Service Field CO Detector and socalgas.com education.						
2016 Total	**1,196**	**1,395**	**0**	**2,591**	**12.6**	

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 2. Segment Services
Workpaper: 2IN004.000 - CI-Segment Services

Determination of Adjusted-Recorded (Incurred Costs):

	2009 ($000)	2010 ($000)	2011 ($000)	2012 ($000)	2013 ($000)
Recorded (Nominal $)*					
Labor	4,445	4,285	4,432	4,396	4,245
Non-Labor	1,632	2,294	2,776	1,392	1,568
NSE	0	0	0	0	0
Total	**6,078**	**6,579**	**7,208**	**5,788**	**5,813**
FTE	50.1	48.1	49.1	47.5	44.4
Adjustments (Nominal $) **					
Labor	104	-12	-51	0	0
Non-Labor	-341	-854	-1,526	0	0
NSE	0	0	0	0	0
Total	**-237**	**-865**	**-1,577**	**0**	**0**
FTE	0.9	-0.1	-0.4	0.0	0.0
Recorded-Adjusted (Nominal $)					
Labor	4,550	4,274	4,381	4,396	4,245
Non-Labor	1,291	1,440	1,250	1,392	1,568
NSE	0	0	0	0	0
Total	**5,841**	**5,714**	**5,631**	**5,788**	**5,813**
FTE	51.0	48.0	48.7	47.5	44.4
Vacation & Sick (Nominal $)					
Labor	822	747	728	704	705
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**822**	**747**	**728**	**704**	**705**
FTE	9.6	8.7	8.3	7.9	7.5
Escalation to 2013$					
Labor	549	374	241	123	0
Non-Labor	139	116	50	25	0
NSE	0	0	0	0	0
Total	**688**	**490**	**291**	**147**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2013$)					
Labor	5,921	5,395	5,350	5,223	4,950
Non-Labor	1,430	1,556	1,300	1,416	1,568
NSE	0	0	0	0	0
Total	**7,351**	**6,951**	**6,650**	**6,640**	**6,519**
FTE	60.6	56.7	57.0	55.4	51.9

* After company-wide exclusions of Non-GRC costs
** Refer to "Detail of Adjustments to Recorded" page for line item adjustments
Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 2. Segment Services
Workpaper: 2IN004.000 - CI-Segment Services

Summary of Adjustments to Recorded:

In Nominal $ (000) Incurred Costs					
Years	**2009**	**2010**	**2011**	**2012**	**2013**
Labor	104	-12	-51	0	0
Non-Labor	-341	-854	-1,526	0	0
NSE	0	0	0	0	0
Total	**-237**	**-865**	**-1,577**	**0**	**0**
FTE	0.9	-0.1	-0.4	0.0	0.0

Detail of Adjustments to Recorded:

Year/Expl.	Labor	NLbr	NSE	FTE	Adj_Type	From CCtr	RefID
2009	-59	0	0	-0.8	CCTR Transf	To 2200-2321.000	CMAK201310260 02724693
Cost alignment adjustment - Transfer web communications labor and FTE costs for 1 Market Advisor from CC 2200-2060 to CC 2200-2321 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)							
2009	-84	0	0	-0.8	CCTR Transf	To 2200-2076.000	CMAK201310260 02910987
Cost alignment adjustment - Transfer customer analytics labor and FTE costs for 1 Market Advisor from CC 2200-2060 to 2200-2076 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)							
2009	0	-341	0	0.0	CCTR Transf	To 2200-2143.000	CMAK201310270 00046320
Cost alignment adjustment - Transfer "Track Mass Market 'Payment Options' " communications nonlabor activities from CC 2200-0422 to CC 2200-2143 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)							
2009	164	0	0	1.7	CCTR Transf	From 2200-0251.000	CMAK201310270 00303723
Cost alignment adjustment - Transfer commercial & industrial services labor and FTE costs for 2 Account Managers from CC 2200-0251 to CC 2200-2061 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2IN004.000)							
2009	83	0	0	0.8	CCTR Transf	From 2200-0248.000	CMAK201310270 00420007
Cost alignment adjustment - Transfer commercial & industrial staff labor and FTE costs for 1 Market Advisor from CC 2200-0248 to CC 2200-2060 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2IN004.000)							
2009 Total	**104**	**-341**	**0**	**0.9**			

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 2. Segment Services
Workpaper: 2IN004.000 - CI-Segment Services

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2010	0	-329	0	0.0	CCTR Transf	To 2200-2143.000	CMAK20131025152929000
Cost alignment adjustment - Transfer "Track Mass Market 'Payment Options' " communications nonlabor activities from CC 2200-0422 to CC 2200-2143 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)							
2010	-24	0	0	-0.2	CCTR Transf	To 2200-2076.000	CMAK20131025162105103
Cost alignment adjustment - Transfer customer analytics labor and FTE costs for 1 Market Advisor from CC 2200-2060 to 2200-2076 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)							
2010	-18	0	0	-0.2	CCTR Transf	To 2200-2321.000	CMAK20131025162933910
Cost alignment adjustment - Transfer web communications labor and FTE costs for 1 Market Advisor from CC 2200-2060 to CC 2200-2321 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)							
2010	45	0	0	0.4	CCTR Transf	From 2200-0251.000	CMAK20131025191642403
Cost alignment adjustment - Transfer commercial & industrial services labor and FTE costs for 2 Account Managers from CC 2200-0251 to CC 2200-2061 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2IN004.000)							
2010	23	0	0	0.2	CCTR Transf	From 2200-0248.000	CMAK20131025191737007
Cost alignment adjustment - Transfer commercial & industrial staff labor and FTE costs for 1 Market Advisor from CC 2200-0248 to CC 2200-2060 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2IN004.000)							
2010	-38	0	0	-0.3	CCTR Transf	To 2200-2396.000	CMAK20131101111514537
Cost alignment adjustment - Transfer "Gas Sustainability Initiatives" labor and FTE costs for 1 Project Manager from NSS 2200-0229 to USS 2200-2396 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2200-2396.000)							
2010	0	-525	0	0.0	CCTR Transf	To 2200-2396.000	CMAK20131101111730047
Cost alignment adjustment - Transfer "Gas Sustainability Initiatives" non-labor activities from NSS 2200-0229 to USS 2200-2396 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2200-2396.000)							
2010 Total	**-12**	**-854**	**0**	**-0.1**			

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: C. Customer Segment Markets
Category-Sub: 2. Segment Services
Workpaper: 2IN004.000 - CI-Segment Services

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2011	0	-43	0	0.0	CCTR Transf	To 2200-2143.000	CMAK20131025151207510
Cost alignment adjustment - Transfer "Track Mass Market 'Payment Options' " communications activities nonlabor from CC 2200-0422 to CC 2200-2143 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2IN001.000)							
2011	-51	0	0	-0.4	CCTR Transf	To 2200-2396.000	CMAK20131101142519790
Cost alignment adjustment - Transfer "Gas Sustainability Initiatives" labor and FTE costs for 1 Project Manager from NSS 2200-0229 to USS 2200-2396 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2200-2396.000)							
2011	0	-1,483	0	0.0	CCTR Transf	To 2200-2396.000	CMAK20131101142803560
Cost alignment adjustment - Transfer Gas Sustainability Initiatives" non-labor activities from NSS 2200-0229 to USS 2200-2396 due to reorganization. (Workpaper 2IN004.000 to Workpaper 2200-2396.000)							
2011 Total	**-51**	**-1,526**	**0**	**-0.4**			
2012 Total	**0**	**0**	**0**	**0.0**			
2013 Total	**0**	**0**	**0**	**0.0**			

Note: Totals may include rounding differences.

Supplemental Workpapers for Workpaper 2IN004.000

Supplemental Workpapers for Workpaper 2IN004

Footnote No. 98

Southern California Gas Company

Backbone Transmission Service

Backbone Transportation Service (BTS)

Important Dates

- Current BTS contracts will end on September 30, 2014
- New BTS contract period will commence October 1, 2014
- BTS Bidding System will go live on June 5th, 2014

Overview

BTS enables market participants -- including end-users, wholesale customers, gas suppliers and California gas producers -- to do the following:

- Hold firm and/or interruptible BTS rights at receipt points into the SoCalGas/SDG&E integrated gas transmission system
- Trade their firm rights through the Secondary Market trading module
- Exchange receipt point rights electronically via the SoCalGas EBB system -- Envoy
- Purchase and use off-system deliveries from the SoCalGas/SDG&E integrated gas transmission system to the PG&E delivery point, which continue to be offered via the SoCalGas EBB system -- Envoy
- Request and utilize existing Pooling Service contracts

2014 Open Season

In the summer of 2014, SoCalGas will hold an open season in which parties may obtain firm rights for receipt point access for the contracts starting October 1, 2014. Parties will be able to obtain firm and/or interruptible rights for the October 1, 2014 BTS contract period electronically via the SoCalGas EBB -- Envoy.

All current Schedule M Receipt Point Maste eements (RPMA) and Schedule L Pooling Service Agreements (PSA) continue in effect.

FEEDBACK

BTS Topics

Regulatory Background

- A.10-03-028 - Application of SDG&E and SoCalGas on Updating Firm Access Rights Service and Rates

Who May Participate

The following parties are eligible to participate in the Backbone Transportation Service:

- Non-core end-use transportation customers of SoCalGas, San Diego Gas & Electric, Southwest Gas, and City of Long Beach
- Wholesale Customers of SoCalGas
- SoCalGas/SDG&E Gas Acquisition Department
- California Gas Producers
- Contracted Marketers
- Core Aggregators (ESPs)
- Storage Customers
- Any creditworthy party

Participant Options

End-use customers will have a variety of options to manage their backbone transportation rights, including:

- Assign your rights to your Marketer or Agent
- Request Core Procurement Service from SoCalGas
- Choose not to opt for firm backbone rights
- Accept, reject or accept partial set-asides as applicable
- Bid for rights during applicable open season process
- Buy firm backbone rights after open season from SoCalGas
- Buy interruptible backbone rights after the Open Season
- Buy firm rights in the secondary market or as available from SoCalGas

Annual Report of System Reliability Issues

Posted per SoCalGas Tariff Rule 41, this is the report of system reliability issues for the Customer Forum on **April 25, 2013**

- Annual Report of System Reliability Issues

Receipt Points and Alternate Receipt Points

Customers holding firm BTS capacity will be able to nominate natural gas for delivery at a specific receipt point and on an alternate firm basis "within-the-zone" from any specific receipt point within an applicable transmission zone.

Customers will also be able to nominate natural gas for delivery on an alternate "outside-the-zone" firm basis from any receipt point on the system. All such nominations will be scheduled in accordance with SoCalGas Rule No. 30, Transportation of Customer-Owned Gas.

Total Transmission Zone Firm Access

Zone*	Zone Firm Access (Mcfd)	Specific Points of Access (Mcfd)	Zone Firm Access MDth/d	Specific Points of Access (MDth/d)
Southern	1,210	EPN Ehrenberg – 1,010	1,240	EPN Ehrenberg – 1,036
		TGN Otay Mesa - 400		TGN Otay Mesa - 410
		NBP Blythe – 600		NBP Blythe – 614
Northern	1,590	TW North Needles - 800	1,619	TW North Needles - 811
		TW Topock - 300		TW Topock - 304
		EPN Topock - 540		EPN Topock - 548
		QST North Needles-120		QST North Needles - 122
		KR Kramer Junction – 550		KR Kramer Junction – 570
Wheeler	780	KR/MP Wheeler Ridge – 765	808	KR/MP Wheeler Ridge – 792
		PG&E Kern River Station - 520		PG&E Kern River Station - 531
		OEHI Gosford – 150		OEHI Gosford – 164
Line 85	160	CaliforniaSupply	171	CaliforniaSupply

Coastal	150	CaliforniaSupply	162	CaliforniaSupply
Other	92	CaliforniaSupply	101	CaliforniaSupply

*Any interstate pipeline, LNG Supplier or PG&E that interconnects through a new receipt point may be added to that Transmission Zone.

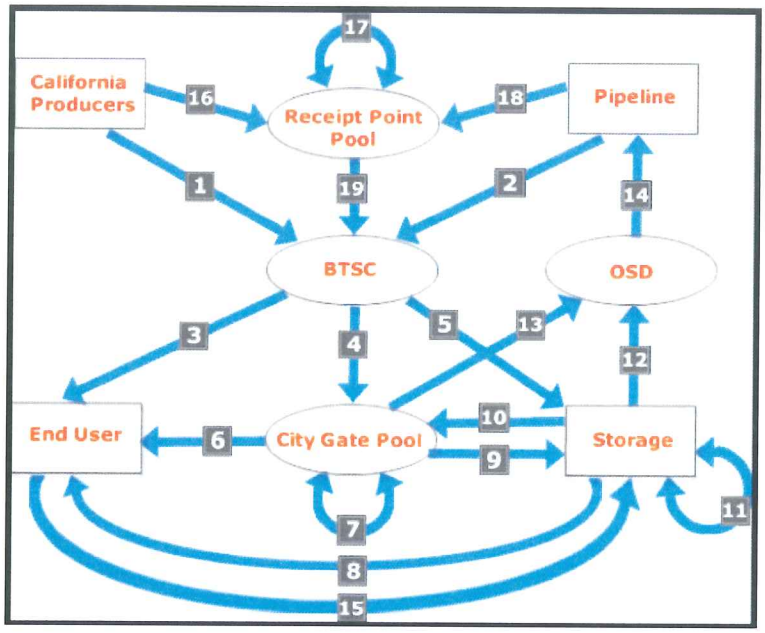
BTS Rate as of July 2014

Rate	Firm & Interruptible	Term	Rate Structure	Reservation Rate Cents/ Dth/Day)	Volumetric Rate (Cents/ Dth)
G-BTS1*	Firm	Up to 3 years	100% Reservation (SFV)	15.406	N/A
G-BTS2*	Firm	Up to 3 years	Modified Fixed Variable (MFV)	12.325	3.081
G-BTS3**	Firm	3 to 20 years	100% Reservation (SFV)	Cost Based	N/A
G-BTSN1	Firm	Short term up to 3 years	100% Reservation (SFV)	Market based up to 15.406	N/A
G-BTSN2	Firm	Short term up to 3 years	Modified Fixed Variable (MFV)	Market based up to 12.325	3.081
G-BTS4	Interruptible	Up to 3 years	100% Volumetric	N/A	Market based up to 15.406

* Terms are available for up to twenty years during Step 3 of the open seasons.
** Customers taking service under G-BTS3 under Rule 39 will also pay the G- BTS1 rate.
N/A = Not applicable to this rate schedule

Backbone Nominations Transaction Paths

Nomination Model



Pipeline

- California Producer to BTSC **(1)**
- California Producer to Receipt Point Pool **(16)**
- Pipeline to BTSC **(2)**
- Pipeline to Receipt Point Pool **(18)**

Receipt Pool Point

- Receipt Pool Point to Receipt Pool Point **(17)**
- Receipt Pool Point to BTSC **(18)**

Backbone Transportation Service Contract

- BTSC to End User **(3)**
- BTSC to City Gate Pool **(4)**
- BTSC to Storage **(5)**

Off-System Delivery

- OSD to Pipeline **(14)**

City Gate Pool

- City Gate Pool to End User **(6)**
- City Gate Pool to City Gate Pool **(7)**
- City Gate Pool to Storage **(9)**
- City Gate Pool to OSD **(13)**

Storage

- Storage to End User **(8)**
- Storage to City Gate Pool **(10)**
- Storage to Storage **(11)**
- Storage to OSD **(12)**

End User

- End User to Storage **(15)**

Backbone Transportation Service Implementation Timeline

COMPLETION DATE or TIME PERIOD	TASKS
4/14/14	• Deadline for qualifying upstream capacity contracts to be place for suppliers who serve wholesale customers under long-term supply agreements.
6/6/14	• Deadline for qualifying upstream capacity contracts to be place for the core customer set-asides (Gas Acquisition or Wholesale Customers). • Deadline to receive Interstate pipeline contracts from set-aside customers (LTK, PG&E, Wholesale, Core, ESPs as applicable) • Deadline for RPMA Online Registration including logon ID, credit changes for Step 1 participants
6/13/14	• Post Potential Set-aside capacity

6/13/14	• Hold Pre-Open Season -Step 1 – Set Aside Round (Step 1)
6/16/14	• Close Step 1
6/17/14	• Post Selected Set-Aside capacity from Step 1 • Deadline to inform SoCalGas of Turnback Option for contracts extending beyond October 1, 2014
8/10/14	• Deadline for Assignments Open Season: Preferential Bidding – Step 2 (Open Season Step 2)
8/18/14	• Post all remaining capacity available for Step 2
8/18/14	• Deadline for RPMA, Online Registration including logon ID, credit changes for Step 2 participants
8/19/14	• Hold Open Season Step 2 (Round 1) – Receipt Point Access Rights
8/25/14	• Close Round 1 of Open Season Step 2: Receipt Point Access Rights assigned
8/25/14	• Post all remaining receipt point access capacities available for Round 2
8/27/14	• Hold Open Season Step 2 (Round 2)
9/2/14	• Close Round 2 of Open Season Step 2: Receipt Point Access Rights assigned
9/3/14	• Post all remaining receipt point access capacities available for Step 3
9/4/14	• Hold Open Season Step 2 (Round 3)
9/8/14	• Close Round 3 of Open Season Step 2: Receipt Point Access Rights assigned
9/9/14	• Post all remaining receipt point access capacities available for Open Season: Long Term Open Season - Step 3 (Open Season Step 3)
9/9/14	• Deadline for RPMA, Online Registration including logon ID, credit changes for Open Season Step 3 participants
9/10/14	• Hold Open Season Step 3: Receipt Point Access
9/15/14	• Close Open Season Step 3: Receipt Point Access Rights assigned
9/16/14	• Post all remaining receipt point access capabilities available after Open Season Step 3
9/17/14 to 9/19/14	• Receipt Point Recontracting
9/23/14	• Upload all contracts to Envoy
9/26/14	• Open Envoy to allow Buy/Exchange Rights in Envoy for contracts beginning 10/1/2014
9/26/14	• Open Envoy to allow for purchase of interruptible contracts 10/1/2014 through 9/30/2014
10/1/14	• Backbone Transmission Service Period Begins

Delivering Pipelines

EPN – El Paso Natural Gas Pipeline

TGN – Transportadora de Gas Natural de Baja California

NBP – North Baja Pipeline

TW – Transwestern Pipeline

MP – Mojave Pipeline

QST – Questar Southern Trails Pipeline

KR – Kern River Pipeline

PG&E – Pacific Gas and Electric

OEHI – Occidental of Elk Hills

Customers holding firm BTS capacity will be able to nominate natural gas for delivery in accordance with SoCalGas Rule No. 30, Transportation of Customer-Owned Gas.

Firm and Interruptible Receipt Point Rights

Firm BTS rights allow firm access to the SoCalGas transmission system receipt points. However, these rights do not guarantee nor imply firm service on SoCalGas' local transmission/distribution system.

Interruptible BTS rights provide "as available" access to the SoCalGas transmission system receipt points. All unused firm BTS capacity or operationally available capacity will be made available on an interruptible basis at the G-BTS4 rate schedule and will be scheduled in accordance with SoCalGas Rule No. 30. Customers taking interruptible service will be required to execute one contract which will provide service from all receipt points.

Off-System Delivery

SoCalGas will contract with any creditworthy party for Interruptible Off-System Backhaul Service under the G-OSD tariff to the PG&E pipeline only. SoCalGas will make available physical displacement capacity at the receipt point on an interruptible basis at the applicable G-OSDI rate.

Pooling Service

Pooling is the administrative aggregation or disaggregation of natural gas supplies at the citygate and receipt point and is defined in SoCalGas' G-Pool tariff. Each customer may have a single citygate pool contract where they will be able to nominate supplies coming through any Backbone Transportation Service Contract and nominate supplies out of the pool contract to end-users, other pool contracts, off-system, or to storage accounts. The city gate pool contract will be required to balance through each nominating cycle.

Agent Designation for Nominating and Trading Rights

A customer may opt to designate one and only one nominating agent or trading agent in addition to itself at any one time to nominate on all BTSCs under a customer's RPMA. Customer must provide appropriate written authorization to SoCalGas of its intent to add or change a designated nominating or trading agent via the Nomination and Trading Authorization Form (Form No. 9924). Such designation shall be subject to that agent complying with applicable tariff and contractual provisions. Customer shall provide appropriate written notice to SoCalGas of its intent to terminate a nominating agent via the Termination of Nominating or Trading Agent Form (Form No. 9926).

Buying Backbone Transportation Service Rights

SoCalGas will provide eligible participants the opportunity to buy Backbone Transportation Service Rights before, during, and after the Open Season Process. Open Season Step 1 and Open Season Step 2 customers will receive a packet by mail with their maximum bidding rights based on historical usage and all necessary agreements. All participants will utilize the SoCalGas on-line bidding system for the Firm Receipt Points Access Rights during the Open Season Bidding process. After the Open Season is completed, customers will be able to buy rights via the SoCalGas EBB system - Envoy.

Below are the available Open Season options.

Buy Firm Rights in Step 1 and 2 by accepting the set-asides or bidding rights provided by SoCalGas via the Open Season online bidding system.

Buy Firm Rights in Step 3 via the online bidding system.

Re-contract your awarded rights by exchanging them to a different receipt point.

Open Season Process

The Open Season Process steps are available to eligible creditworthy participants. Participants must have a Master Services Contract, complete a Receipt Point Master Services Agreement (RPMA) and register through the online bidding system at the SoCalGas website. This online bidding website will be available only during the Open Season process.

Set-Asides and Awarded Capacity

To be posted upon completion of bidding step and round.

Step 1 -- Open Season: Set-Aside Receipt Point Rights

Open Season Step 1 of the Backbone Transportation Service bidding process will be reserved for the assignment option of set aside capacity to specific customers as detailed in the G-BTS Backbone Transportation Service tariff including:

SoCalGas/SDG&E Gas Acquisition

Wholesale Customers

California Gas Producers

Certain LTK Contract Holders

PG&E G-XF Contracts

Core Aggregators

Rate Schedule G-BTS1 or G-BTS2

Term: 3 Years

Preliminary Set-Asides

Step 2 -- Open Season: Preferential Bidding

End-use customers in good credit standing with SoCalGas are deemed creditworthy to their specified maximum bidding rights.
Capacity Bidding System - Online Bidding Platform

3 Rounds

Maximum Bidding Rights provided to each participant

Rate Schedule G-BTS1 or G-BTS2

Term: 3 Years

Participants

Non-core end-use transportation customers of SDG&E/SoCalGas

Non-core end-use transportation customers of Wholesale Customers

SDG&E/SoCalGas Gas Acquisition

Core Aggregators

Gas Suppliers with customer assigned bidding rights [1]

Parties with tolling agreements

[1] Eligible end use customers may assign their Open Season bidding rights to a third party. The assignment of rights is for the entire volume and term. The form and additional details can be found at the Backbone Transportation Service Assignment Form section.

Step 3 -- Open Season: Long Term

Any creditworthy party may participate

Available capacity is any receipt point capacity remaining after the Step 2 process

1 Round – Rate Schedule G-BTS1 or G-BTS2

Bids Annual Base Load

Term: 3 to 20 Years

Bids with Longer Term Awarded Over Shorter Term

Customer Meetings

SoCalGas will hold informational customer webinar training in the coming months to assist customers in understanding and participating in this new program.
Dates TBD

Open Season Training Dates

SoCalGas will be hold webinar training sessions in the Open Season process. Dates are to be determined.

Bidding Rights Assignment Form

The Backbone Transportation Service assignment form is designed to allow a noncore customer with bidding rights in Step 2 of the Open Season to assign those rights to a third party ("assignee"). This enables the assignee to bid in Step 2 of the Open Season and be the contract holder of the Backbone Transportation Service rights. The maximum bidding rights would be irrevocably transferred (unless cancelled prior to the Open Season Step 2) to the other party and BTS rights awarded during Step 2 of the Open Season would be held in the name of the assignee. The assignment or transfer of rights is for the entire quantity and term and may not be divided between separate assignees.

The election form must be completed by the end-use customer in order to allow SoCalGas to prepare the contracts, verify credit, and complete other administrative duties necessary for parties to bid for firm receipt point access rights during the Open Season, Step 2. This assignment form is valid only for the 2011 Open Season process.

BTS Credit Application

- Contract Request form with Credit Application (PDF)

Customer Presentations

How to Participate

New participants to the BTS Open Season must first establish credit with SoCalGas. Non-core end-use customers of SoCalGas and SDG&E are deemed creditworthy up to their Maximum Bidding Rights and do not need to complete the application.

Current RPMA holders should review their credit limit with SoCalGas Credit Dept. based on G-BTS rate schedules. Additional requests for credit and all other interested parties in the BTS Open Season must complete and return the Credit Application.

Complete the credit application and send to this address:

Southern California Gas Company
ATTENTION: Major Markets Credit and Collection
555 W. Fifth Street
Mail Location GT18A3
Los Ángeles, California 90013-1011

Toll Free Phone (866) 313-6622

Fax (213) 244-8316

Contact Information

For more information, please contact your SoCalGas account representative or the Capacity Products Contact Form.

Note: Depending on your browser settings, you may see a security certificate. This will not affect our ability to receive your contact information.

Back to Natural Gas Services Homepage

Updated 6/2014

Supplemental Workpapers for Workpaper 2IN004

Footnote No. 103

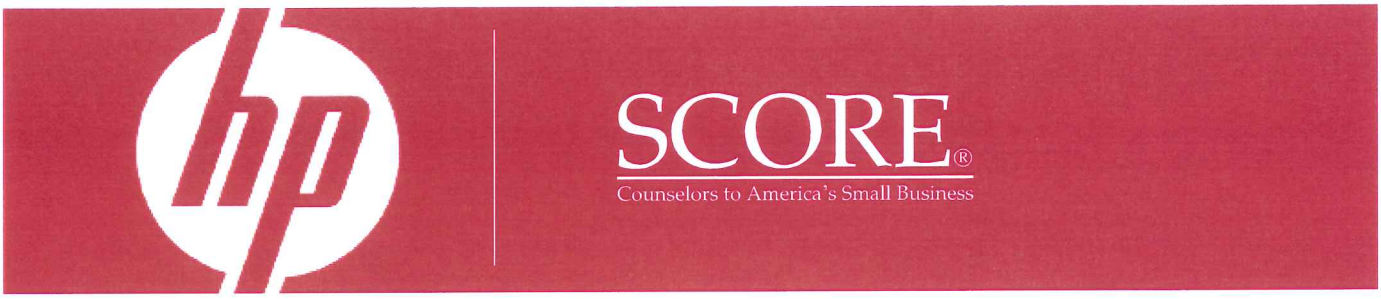
HP and SCORE: Counselors to America's Small Business

Impact on U.S. Small Business of Natural & Man-Made Disasters

Impact on U.S. Small Business of Natural & Man-Made Disasters

A compilation of public and private sector intelligence

Presented by HP and SCORE: Counselors to America's Small Business



Introduction

The nation's 27-plus million small businesses grow more dependent each day on their computers and computer systems. No matter what the field, today it is almost impossible to do business without having an internet presence and an up-to-date website. Moreover, most businesses today, from the largest corporations with their huge enterprise systems to the smallest mom-and pop business operating with a single computer, store their most vital and irreplaceable business records electronically.

These small businesses face a very real crisis, one that a vast number of small business owners simply have not focused on – the always looming possibility that they could suffer a catastrophic data loss, one that could well threaten the very existence of their businesses.

The U.S. Small Business Administration says:
Small business owners invest a tremendous amount of time, money and resources to make their ventures successful, and yet, while the importance of emergency planning may seem self-evident, it may get put on the back-burner in the face of more immediate concerns. For small business owners, being prepared can mean staying in business following a disaster.

The key is being prepared. The consequences of ***not*** being prepared can mean more than property loss; they can mean the loss of a business, jobs and economic well-being.

Southern California Small Business is Shaken but Not Broken

Robert "Bob" Lorsch remembers January 17, 1994 very well. At about 4:30 am, he and his neighbors in Los Angeles and for that matter most of Southern California were awakened by the violent shaking of what came to be called the Northridge Earthquake. With a Richter scale magnitude of 6.7, the ground acceleration was the highest ever recorded in an urban area in North America. It would prove to be the most costly earthquake in United States history. The earthquake damaged up to 1,000 buildings and knocked out power and water service for tens of thousands.

Bob Lorsch's marketing and public relations company had its offices on the top floor of a high-rise suburban office building near the quake's epicenter. In an instant he was wiped out. Every piece of information, all his company's work-in-progress, was on computers in his office and what hadn't been destroyed, was inaccessible for weeks because the building was declared structurally unsafe.

"We had considerable damage and the building was shut down so the only option was to relocate the business to my home," Lorsch recalls. "But my home was also devastated and I needed disaster relief just to rebuild my home. Then I didn't have much of the data and information that was central to my business. I had to continue to pay my people but I wasn't collecting my receivables so it was a very, very difficult time for me."

In the end a client came through with a new project and over time Bob was able to reconstruct his business. Out of the ashes of this disaster Bob conceived of a service where no matter where in the world or whatever the circumstance, individuals and families would never be far from their personal records – birth certificates, vital forms, insurance and healthcare records with a service he launched called MyMedicalRecords.com.

Everything for this Gulf Coast Business was Washed Away by Katrina

Makeup and wardrobe consultant, Adrienne Moncrief Hemphill has a similar story. She ran a small but thriving custom-label makeup business out of her Bay St. Louis, Mississippi home that was demolished by Hurricane Katrina. Essentially her most valuable possession was her mailing list of her some 500 customers she kept on her computer.

She lost everything in the storm, her catalogs, her Web site, her inventory of products and most disastrous of all, her mailing list. She was able to relocate to Jackson, Mississippi where she faced the prospect of essentially starting her business over again from scratch.

"I sat down with a woman who worked with me and we tried to recreate my customer list from memory," she relates. "Eventually we were able to remember about 150 of the 500 customers I had. I was then able to get my web site back up and running and between the web site, a book I had

written that has been on sale locally and various stories I have had in the local newspapers regarding my consulting business, over now a two year period maybe another 200 of my former customers have found me – I didn't find them. So now I have back about 350 of the five hundred customers I had the day Katrina hit."

But she admits, it has not been easy. But she has learned a valuable lesson. Today all the data on her computer is backed up at a remote location.

A Computer Crash Nearly Totals This Midwestern Company's Grant Opportunity

For Deborah Hopkins, president of St. Louis based Christian Management Resources, it wasn't an earthquake or a hurricane that almost spelled disaster for her small company, it was the most common of computer problems, a crashed hard drive. Right in the middle of preparing a critical grant application, with the deadline approaching, her company's computer suddenly crashed completely.

"We were between offices, so I was using only one computer at the time, Ms. Hopkins remembers, "but suddenly as we faced this inflexible grant application deadline, the computer crashed completely. We were not backing up every day and some of the backup we had was old or the tape system was not very effective, so basically everything we had and needed was suddenly inaccessible. We faced a disaster."

Ms. Hopkins consulted all sorts of experts of experts over the next three days. Most told her the only option was to reformat her hard drive thus losing all her data, especially all the data relating to the grant application. Things looked truly dire.

"At about 4:00 in the morning I suddenly remembered something I had learned years before in programming," she relates, "and I called a help desk and they helped me through partitioning the hard drive and then reformatting only the new partition and re-installing the operating system there, keeping my data on the old partition."

The Hail Mary worked, and she got access to her data and was able to finish the grant application. But this episode taught her a valuable lesson.

"We now operate with three computers and we back up every night onto CD's which are stored off-premise. I am now looking at ways of backing up more efficiently and storing the data at a remote site. I'll never forget those three days and two nights."

Many others, those involved in the Northridge quake, in the aftermath of Hurricane Katrina, and in myriad other disasters, have not been nearly as fortunate as Bob Lorsch or Adrienne Moncrief Hemphill or Deborah Hopkins in the recovery and rebuilding of their businesses in the wake of a natural or man-made disaster. The sad truth is that none of these stories needed to be told if every business took the time and detail to create a disaster recovery plan while instituting basic data protection procedures to ensure continuity of their businesses.

The Experts All Agree:

"A Company that experiences a computer outage lasting more than 10 days will never fully recover financially. 50 percent will be out of business within five years."[1]

An estimated 25 percent of businesses do not reopen following a major disaster[2]

70 percent of small firms that experience a major data loss go out of business within a year.[3]

Of companies experiencing catastrophic data loss:

- 43% of companies never reopened
- 51% of companies closed within 2 years[4]
- 80% of companies that do not recover from a disaster within one month are likely to go out of business.[5]
- 75% of companies without business continuity plans fail within three years of a disaster[6]
- Companies that aren't able to resume operations within ten days (of a disaster hit) are not likely to survive.[7]
- Of those businesses that experience a disaster and have no emergency plan, 43 percent never reopen; of those that do reopen, only 29 percent are still operating two years later.[8]

Are Small Businesses Prepared?

This all might seem so obvious, that it is hard to conceive of any small business that does not frequently back up its key data. The SBA tells all small business owners: "Make back-up copies of all tax, accounting, payroll and production records and customer data on computer hard drives, and store the records at an offsite location at least 100 miles away. Important documents should be saved in fireproof safe deposit boxes." It all seems so obvious, yet a national Harris Interactive survey of 597 computer users[9], as reported in Realty Times found:

- One in four users frequently back up digital files, even when 85 percent of computer users say they are very concerned about losing important digital data.
- Thirty-seven percent of the survey's respondents admitted to backing up their files less than once per month.
- Nine percent admitted they have never backed up their files.
- More than 22 percent said backing up information is on their to-do list, but they seldom do it.

Most of the 143,000 disaster loans made by the SBA after the Gulf Coast hurricanes were for flood damage. As former SBA Administrator Hector V. Barreto told a key meeting of disaster relief administrators[10] "Last year's Gulf Coast hurricanes and this month's flooding in New England are reminders that no matter where you live, there's always the potential for a major disaster. No one is insulated from the threat of losses caused by wind, storms, floods and wildfires, power outages and other natural and man-made disasters. These catastrophes should remind us of the need to be prepared, to have a plan not just to survive disaster, but to recover quickly."

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[1] Jon Toiga, *Disaster Recovery Planning: Managing Risk and Catastrophe in Information Systems*, (Yourdon Press, 1989)

[2] "Open For Business" a publication of The Institute for Business & Home Safety (IBHS), a nonprofit association that engages in communication, education, engineering and research for the insurance industry. See www.ibhs.org/docs/OpenForBusiness.pdf

[3] Contingency Planning, Strategic Research Corp and DTI/Price Waterhouse Coopers (2004) and is widely quoted in places such as: Diana Shepstone, National data awareness project launched to help businesses prevent data disasters (Data Centre Solutions, Jan. 8, 2007) see: http://www.datacentresols.com/news/articles-full.php?newsid=5455

[4] University of Texas Center for Research on Information Systems, as cited in Datamation, June 14, 1994
[5] Jonathan Bernstein, president, Bernstein Crisis Management, LLC in Director, June 1998, v51n11, p44
[6] Bruce Blythe, CEO, Crisis Management International in Blindsided: A Manager's Guide to Catastrophic Incidents in the Workplace By Bruce T. Blythe (Portfolio Hardcover, August 22, 2002)
[7] http://www.techworld.com/cmsdata/whitepapers/833/How%20Secure%20is%20your%20Storage_Symantec.pdf.
[8] The Hartford's Guide to Emergency Preparedness Planning, created by The Hartford Financial Services Group and now published by J.J. Keller & Associates
[9] Harris Interactive survey done for the Imation Corp., September, 2002
[10] Speech given May 22, 2006, see SBA Release Number: 06-41

What Constitutes a Disaster

What exactly is a disaster for a small or growing business? A disaster is a sudden, unplanned calamitous event that creates an inability for an organization to provide critical business functions for an undetermined period of time resulting in great damage or loss to that organization.

The Institute for Business & Home Safety (IBHS), a nonprofit initiative of the insurance industry, says:

Each year disasters such as floods, hurricanes, tornadoes, and wildfires force thousands of businesses to close. But even more common events, such as building fires, cause the same result. Our research shows at least 25 percent of those businesses that close following events such as these do not reopen. Many that do, struggle to stay in business.

Even the best-designed and well maintained buildings can be damaged, forcing a business closure. And even if a building sustains no damage, a major hurricane, earthquake or other catastrophic event can close roads, cause power outages or create other problems that force a business to close.

Small businesses are especially vulnerable, because few of them have the resources or knowledge to assess disaster risks and develop comprehensive mitigation and recovery plans.[11]

Major Disasters

The International Red Cross says the economic cost of natural disasters has skyrocketed. In the past two decades, direct economic loss from natural disasters in the U.S. has multiplied five fold to $629 billion. Munich Re, the world's largest re-insurance agency reports that in 2004, disaster related loss in U.S. was $145 billion up from $65 billion in 2003.

Natural disasters can take many forms. They can be due to earthquakes, floods, freezing weather and winter storms, hail, hurricanes, tornados, other water damage or wildfires.

According to the Insurance Information Institute (III)[12], over the 20-year period, 1986 to 2005, hurricanes and tropical storms made up 47.5 percent of total catastrophe losses, followed by tornado losses (24.5 percent), winter storms (7.8 percent), terrorism (7.7 percent), earthquakes and other geologic events (6.7 percent), wind/hail/flood (2.8 percent) and fire (2.3 percent). Civil disorders, water damage and utility services disruption combined represented less than 1 percent.

According to NOAA's National Climatic Data Center, the U.S. has sustained 70 weather-related disasters over the past 27 years in which overall damages/costs reached or exceeded $1 billion. 61 of these disasters occurred during the 1988-2006 period with total unadjusted damages/costs exceeding $430 billion[13].

Before Katrina, in August and September 2004, hundreds of thousands of businesses from Florida and the Gulf Coast to the Appalachian Mountains went more than a week without power. And some went weeks before power was restored. Rivers spilled over their banks, flooding buildings, washing out roads. Tens of thousands of buildings were damaged or destroyed. Scores of lives were lost. This was all the result of Hurricanes Charley, Frances, Ivan and Jeanne; four hurricanes that struck the southern and southeast United States.

No part of the country is really immune from natural disasters. Some parts may not see hurricanes and some might not be near earthquake fault lines, but none are exempt from all kinds of natural calamities. Small- to medium-sized businesses are the most vulnerable in the event of an emergency.

[11] Open For Business, The Institute for Business & Home Safety, Op Cit, p. 1, 10. Also Getting Back To Business–A Guide for the Small Business Owner Following Disaster (The Institute for Business & Home Safety, 2007) see: http://www.ibhs.org/ business_protection

[12] Robert P. Hartwig, President & Chief Economist, Insurance Information Institute, Financial and Market Impacts of Hurricanes on Property/Casualty Insurers Past, Present & Future Presented at 2007 National Hurricane Conference, New Orleans, LA, April 5, 2007

[13] Lott, Neal and Ross, Tom Tracking and Evaluating U.S. Billion Dollar Weather Disasters, 1980-2005 (National Climatic Data Center, NOAA, Asheville, North Carolina, 2007) See: http://www1.ncdc.noaa.gov/pub/data/papers/200686ams1.2nlfree.pdf

Top 20 states / Number of major disasters
declared 1955-2007[14]

1. Texas / 80
2. California /72
3. Florida /59
4. New York /55
5. Louisiana /53
6. Oklahoma /51
7. Alabama /46
8. Kentucky /45
9. Pennsylvania /42
10. Ohio /42
11. Mississippi /42
12. Illinois /41
13. Arkansas/ 41
14. West Virginia /40
15. Washington /40
16. Virginia /39
17. Missouri /39
18. Minnesota /39
19. Tennessee /38
20. Kansas /36
21. Iowa /36

THE TEN MOST COSTLY CATASTROPHES, UNITED STATES[15]

Rank	Date	Event	Loss in millions
1	Aug. 2005	Hurricane Katrina	$41,910
2	Aug. 1992	Hurricane Andrew	22,272
3	Sep. 2001	World Trade Center, Pentagon Attacks	21,401
4	Jan. 1994	Northridge, CA earthquake	17,004
5	Oct. 2005	Hurricane Wilma	10,632
6	Aug. 2004	Hurricane Charley	7,978
7	Sep. 2004	Hurricane Ivan	7,588
8	Sep. 1989	Hurricane Hugo	6,820
9	Sep. 2005	Hurricane Rita	5,809
10	Sep. 2004	Hurricane Frances	4,904

[14] Federal Emergency Management Agency, Disaster Statistics (2007) See: http://www.fema.gov/news/disaster_totals_annual.fema

[15] Insurance Information Institute (III), Hot Topics (August, 2007) See: http://www.iii.org/media/hottopics/insurance/catastrophes/

Catastrophe losses in 2005 totaled $61.2 billion from 24 disasters. Catastrophe losses for 2006 totaled $9.2 billion, according to the Insurance Information Institute. There were 33 events last year that met the insurance industry's definition of a catastrophe. Losses in Indiana were the highest of any state, at $1.5 billion, followed by Missouri, Tennessee, Texas and Kansas. Together, losses in these states represented half of the total for 2006.

Hurricanes

According to the III,[16] seven of the 10 most expensive hurricanes in US history occurred in the 14 months from Aug. 2004 – Oct. 2005: Katrina, Rita, Wilma, Charley, Ivan, Frances & Jeanne.

The 2005 hurricane season was unprecedented in its scope and magnitude. More than three million insurance claims totaling some $57 billion resulted from four hurricanes – Katrina, Wilma, Rita and Dennis.

The devastation that was Hurricane Katrina is still fresh in our minds and the calamitous results can still be seen not just in New Orleans but across the Gulf Coast. Katrina generated the largest single loss in the history of insurance – $40.6 billion and more than 1.7 million claims – across six states – Louisiana, Mississippi, Alabama, Florida, Tennessee, and Georgia.[17]

Katrina

The losses from Katrina were actually considerably in excess of the $41.9 billion being reported by the insurance industry. That amount does not include the very sizable losses not yet compensated for because of the ongoing dispute about coverage limitations from flood damage. $15.3 billion in losses have been paid under the National Flood Insurance Program. But it is estimated that as much as an additional $20 billion was accrued in loses not covered by insurance and therefore not reported in industry figures.

Of paid out claims, 52 percent, $20.8 billion, were for commercial loses. $9.8 billion, 31 percent, was for business interruption. According to Kenneth Yancey, CEO of the national organization, SCORE – Counselors to Small Business, a conservative estimate of the loss suffered by small business would be about 40 percent of the $20.8 billion total. This is supported by surveys done in the region by authoritative agencies.

Katrina destroyed 60 percent of New Orleans' small businesses, according to a study by the Institute for Southern Studies, leaving a gap in the city's recovery efforts.

Approximately 81,000 businesses in Louisiana were damaged by hurricanes Katrina and Rita last year, according to the Census Bureau. Mary Lynn Wilkerson, director of the Louisiana Small Business Development Centers says the number was greater, 110,000 businesses in Louisiana were destroyed or severely impacted[18]. Although 75 percent have since reopened their doors, around 18,700 have closed permanently since the storms, according to the Louisiana Recovery Authority[19]. Two-thirds of those not reopening have are classified as small business.

We lost over 60 percent of our small businesses," says Doug Gurley, state director of the Mississippi Small Business Development Center[20].

[16] Insurance Information Institute (III), Stats by Issues – Hurricanes (August, 2007). See http://www.iii.org/media/facts/statsbyissue/hurricanes
[17] Robert P. Hartwig, OP CIT, see: http://server.iii.org/yy_obj_data/binary/769959_1_0/nhc2007.pdf
[18] Adams, Rhonda Helping Small Business in the Wake of Katrina (USA Today, Sept. 1, 2005). Reporting on hearing Senate Committee on Small Business and Entrepreneurship. See http://www.usatoday.com/money/smallbusiness/columnist/abrams/2005-09-01-small-business-katrina_x.htm and http://sbc.senate.gov/20050922.cfm
[19] Louisiana Recovery Authority (LRA), Quarterly Report (June 6, 2006) p. 10 See: http://www.lra.louisiana.gov/assets/quarterlyreport/LRAQuarterlyReport060606pdf.pdf

[20] Appearing before Entrepreneurship - The Foundation for Economic Renewal in the Gulf Coast Region (Proceedings of the Conference, April 11, 2006 sponsored by the U.S. Small Business Administration Office of Advocacy, et. al.) See: http://www.sba.gov/advo/research/proceedings06.pdf

Earthquakes

Records show that in the last 100 years, earthquakes have occurred in 39 states and have caused damage in all 50. About 5,000 quakes can be felt each year, with some 400 capable of causing damage to the interior of buildings and 20 capable of causing structural damage. Because earthquakes in the eastern part of the country tend to be thrust-fault quakes, which produce an up-and-down motion rather than the horizontal side-to-side common in California, damage could be 10 times greater, according to seismic experts. The degree of damage also depends on other variables such as the structure of the building and soil conditions.

THE TEN MOST COSTLY U.S. EARTHQUAKES[21]

Rank	Year	Location	Magnitude	Loss in $ Millions
1	1994	Northridge, CA	6.7	$18-27,000
2	1989	San Francisco Bay area; Loma Prieta, CA	6.9	11,381
3	1964	Alaska and west coast of United States (tsunami damage from earthquake near Anchorage, Alaska)	9.2	3,252
4	1971	San Fernando, CA	6.5	2,753
5	2001	Washington, Oregon	6.8	2,624
6	1987	Southern California; primarily in Los Angeles–Pasadena–Whittier area	5.9	635
7	1933	Long Beach, CA	6.3	620
8	1952	Kern County, CA	7.5	456
9	1992	Southern California; Landers–Joshua Tree–Big Bear	7.6	132
10	1992	Northern California Coast; Petrolia–Eureka	7.1	95

Tornados

Though generally not as costly in terms of insured values as hurricanes, because they strike a more limited geographic area, tornadoes are more frequent. Tornadoes and related weather events caused more than $8 billion in insured losses in 2006, according to an A.M. Best study[22]. A March 31, 1973 tornado in central and northern Georgia had been the costliest tornado on record, according to the study, which put the total damages from that event at $5.21 billion in 2007 dollars. The next four most costly tornadoes occurred June 8, 1966 in Topeka, Kansas ($1.94 billion); May 11, 1970 in Lubbock, Texas ($1.43 billion); May 3, 1999 in Oklahoma City, Oklahoma ($1.30 billion) and April 3, 1974 in Xenia, Ohio ($98 million). New Jersey tops the list of states with the highest average expected losses from tornadoes, followed by Connecticut and Massachusetts, based on A.M. Best's analysis of RMS modeling data. Texas has the highest annual occurrence rate, followed by Oklahoma and Kansas.

According to the National Oceanic and Atmospheric Administration (NOAA), each year, about 1,200 tornadoes with gusts of wind as high as 200 mph touch down in the United States. In the decade, 1965-1974, they were responsible for an average of 141 deaths each year, compared with 62 in the 10 years 1997-2006. The peak of the tornado season is April through June or July. Spring tornadoes tend to be more severe and strike the Southeast, which is more densely populated than the Great Plains, thus causing more deaths than those in the summer months.

Since 1990 the number of tornadoes has generally exceeded 1,000 a year. In the three preceding decades, the only year in which there were more than 1,000 tornadoes was 1973, when 1,102 were reported. This increase may reflect greater ability to detect tornadoes.[23]

[21] Insurance Information Institute (III), Stats by Issues – Earthquakes (August, 2007). See http://www.iii.org/media/facts/statsbyissue/earthquakes/
[22] Insurance Information Institute (III), Stats by Issues – Tornados (August, 2007). See http://www.iii.org/media/facts/statsbyissue/tornadoes
[23] Ibid.

Fires

According to FEMA's U.S. Fire Administration, in 2005 (the most recent year figures are available) there were 115,000 business fires in this country resulting in 50 deaths, 1,500 injuries and $23.18 billion in economic loss[24]. This is in reported fires. Perhaps 20 percent of fires go unreported. Using a conservative estimate of 40 percent of this loss was suffered by small and medium sized businesses, the economic loss suffered in fires by small and medium sized businesses in just 2005 alone was somewhere in the vicinity of $9.5 billion dollars and using the estimates from organizations like the Institute for Business and Home Safety that 25 percent of businesses do not reopen following a major disaster, it means that thousands of small and medium sized businesses went out of existence in 2005 because of fires.

Floods

Floods are the most common and widespread of all natural disasters - it accounts for 40 percent of all losses from natural disasters. According to NOAA, flash flooding is the leading cause of weather-related deaths in the U.S.- approximately 200 deaths per year.

According to FEMA:

- Floods and flash floods happen in all 50 states.
- Everyone lives in a flood zone.
- The average annual U.S. flood losses in the past 10 years ('96-'05) was more than $2.4 billion[25].

The Department of Homeland Security (DHS) says:
Flood accounts for significant property and business interruption losses affecting thousands of enterprises each year. Damaging flood events can develop from prolonged frontal weather systems affecting small local areas, or from tropical storm and hurricane events affecting the coastline and inland regions of exposed coastlines. Flood damages can be difficult to predict and are heavily influenced by local terrain and urbanized developments. This phenomenon is a dynamic one and past history does not necessarily predict future event outcomes.[26]

Mother Nature does not have to be the culprit in huge flood disasters, witness what is still called the Great Chicago Flood.
In 1899 the city of Chicago started work on a series of interconnecting tunnels located approximately forty feet beneath street level. This series of tunnels ran below the Chicago River and underneath the Chicago business district, known as The Loop. The tunnels housed a series of railroad tracks that were used to haul coal and to remove ashes from the many office buildings in the downtown area. The underground system fell into disuse in the 1940's and was officially abandoned in 1959 and the tunnels were largely forgotten until April 13th, 1992.

Rehabilitation work on the Kinzie Street bridge crossing the Chicago River required new pilings and a work crew appearently drove one of those pilings through the roof of one of those long abandoned tunnels. The water flooded the basements of Loop office buildings and retail stores and an underground shopping district. More than 250 million gallons of water quickly began flooding the basements and electrical controls of over 300 buildings throughout the downtown area. At its height, some buildings had 40 feet of water in their lower levels. Recovery efforts lasted for over four weeks and, according to the City of Chicago cost businesses and residents, an estimated $1.95 billion. Some buildings remained closed for weeks. In those buildings were hundres of small and medium businesses suddenly cut off from their data and records and all that it took to conduct business. The underground flood of Chicago proved to be one of the worst business disasters ever.

[24] United States Fire Administration U.S. Non-Residential Fire Loss: 1996-2005 (excerpted from the National Fire Protection Association Fire Loss in the U.S. During 2005, Abridged Report). See: http://www.usfa.dhs.gov/statistics/national/non-residential.shtm
[25] Federal Emergency Management Agency, Flood Smart – Fast Facts (from www.floodsmart.gov web site, August, 2007) See: http://www.floodsmart.gov/floodsmart/pages/fastfacts.jsp
[26] As quoted by ABS Corporate Solutions a DHS contractor at Flood Risk Review and Analysis (August, 2007) See: http://eqecat.com/abscorporatesolutions/floodRisk.html

Personal Disasters

For a small, growing or even medium sized business a disaster can be caused by a hurricane or a tornado, by a fire, or simply by a wrong keystroke. One study shows that 50 percent of data loss is caused by user error. But no matter how it is caused, a loss of data, or access to data for any kind of extended period, inevitably means a loss of revenue, a loss of productivity, a loss of reputation, and increased costs.

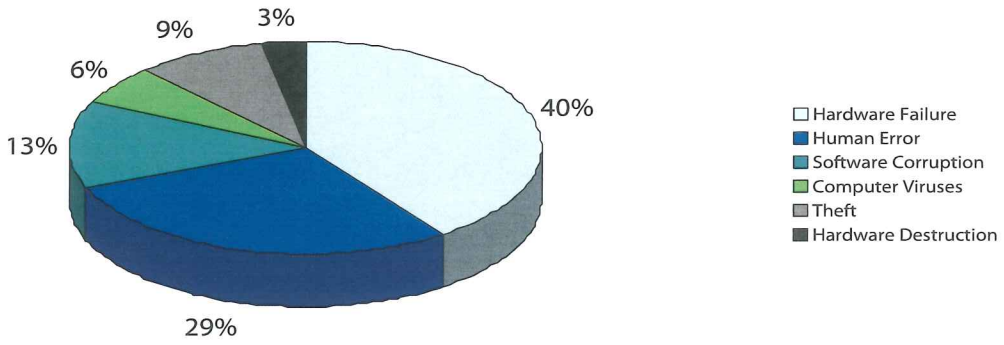
A frozen pipe that bursts on a weekend might not be detected until you open for business on Monday morning; long after the resulting flood has destroyed inventory, equipment, floors or walls. Disasters that threaten a business can happen anywhere at any time.

Some rather startling statistics that are generally accepted in the data recovery field and reported by the University of North Carolina's Information Technology Service:

- A hard drive crashes every 15 seconds
- 2,000 laptops are stolen or lost every day
- 32% of data loss is caused by human error
- 31% of PC users have lost all of their PC files to events beyond their control.
- 25% of lost data is due to the failure of a portable drive.
- 44% of data loss caused by mechanical failures
- 15% or more of laptops are stolen or suffer hard drive failures
- 1 in 5 computers suffer a fatal hard drive crash during their lifetime.
- 40% of Small and Medium Sized Businesses don't back up their data at all.
- 60% of all data is held on PC Desktops and laptops

Professor David M. Smith, PhD, of Pepperdine University's Graziadio School of Business and Management writes[27]: "The cost of lost data from computers is substantial. Businesses must be proactive in protecting this important resource."

causes of data loss [28]



[27] Smith, David M., "The Cost of Lost Data," Graziadio Business Report, a publication of Pepperdine University's Graziadio School of Business and Management, Vol. 6, Issue 3, 2003). See http://gbr.pepperdine.edu/033/dataloss.html

[28] "2000 Safeware Loss Study"; ONTRACK Data International, Inc. "Understanding Data Loss"

To show how unforeseeable a disaster can be, for Tessco Technologies, located outside Baltimore, Maryland thought it had little to fear. It was not in a flood zone, not in an earthquake zone and devastating hurricanes were more than hundred year events. But in the case of Tessco, the culprit was a faulty fire hydrant.

One outside its Hunt Valley data center failed spectacularly on October 12, 2002 and several hundred thousand gallons of water blasted through a concrete wall leaving the company's primary data center under several feet of water and left some 1400 hard drives and 400 SAN disks soaking wet and caked with mud and debris.[29]

The Importance of Planning and Preparing For Recovery

Disasters can be averted with some foresight and planning. Look at Tessco. According to Hal Kuff, Manager, systems and networks, all data was backed up and the company moved into a backup data center, restored the data from tape backups, and was able to resume operations within a few hours. Eventually, the data restoration firm, Asset Recovery Technologies, was able to recover all data from most of the hard drives and the SAN units, but had not the backups been immediately available the company would have suffered an irreparable loss.

Scott T. Newman, president and co-owner of Brite Visual Products, a $4 million per year distributor of whiteboard products, arrived at his Quincy, Massachusetts office one morning only to find a large furniture truck wrapped around the utility pole outside. His building was completely dark. With no power, his 15 employees of his couldn't boot up their PCs or access critical data including orders pending and key financial information. For many small businesses this wayward truck would have been a major disaster. But this was a story with a happy ending.

Newman had an emergency plan. "I've lived through too many New England winters to take any more chances," says Newman. "We'd just signed on with Amazon.com as a partner, and we couldn't afford any downtime."

The business moved quickly to employees homes. Incoming calls were rerouted to their homes and most importantly, copies of customer records were stored remotely and assessable by the employees from their home or notebook computers. The business never missed a beat and what could have been a huge problem was reduced to an annoyance.[30]

Even small companies, the ultimate Mom and Pop enterprises, can survive disaster with some foresight and planning. Witness Christine Dumas McAtee's formerly New Orleans-based Insignia Marketing, Inc., a thriving promotional advertising products company established in 2002 and based in suburban Metairie, Louisiana. Before Hurricane Katrina began to pour water into her office from above and below, McAtee knew what to do.

"I grabbed my kids and other irreplaceable home and office items and headed out of harm's way," she remembers.

Upon returning a week later, the level of destruction in New Orleans was unmistakably apparent. So McAtee decided to view the disaster as an opportunity to grow even larger, and immediately took steps to open a permanent office in The Woodlands, Texas, a suburb of Houston.

"I did not have time to save all of my computers or job folders, but I was able to take my backup hard disks, McAtee relates. That plus the fact that almost all of my important sales and marketing data was backed up on my franchisor's computer system in Wisconsin meant that after I secured office space and bought new computers, I was basically back in business right away as if nothing had happened. As a single mother, the quick transition was critical for success."

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[29] Baltimore Business Journal (June 23, 2003). Computer World (November 17, 2003) See also Nth Generation Computing (August, 2007) See: http://www.nth.com/Data-Recovery-Clients/profile.asp?id=9. Also http://baltimore.bizjournals.com/baltimore/stories/2003/06/23/daily28.html, and http://www.disasterhelp.com/images/Computerworld_Article.pdf

[30] Ferguson, Kevin What Do You Do When Disaster Strikes? (AllBusiness.com, August, 2007) See: http://www.allbusiness.com/11933-1.html

Conclusion

No one – that we're aware of, at least – can predict the date, time and location of a natural (or unnatural) disaster. Because of this, it's only wise to expect that something can and will likely befall any small business. Being prepared for such events, then, makes good sense on many levels. Having a sound disaster recovery plan, and the resources – on-site and away from the office – to deal with it, will allow a business to better function in the aftermath of an unexpected event.

As FEMA puts it "Every year emergencies take their toll on business and industry – in lives and dollars. But something can be done. Business and industry can limit injuries and damages and return more quickly to normal operations if they plan ahead…Whether you operate from a high-rise building or an industrial complex; whether you own, rent or lease your property; whether you are a large or small company you must prepare."[31]

There are many resources available to help a small or growing business make the proper preparations. Disasters are going to happen. The best way to survive is through preparation. And the best way to prepare is to understand that this can happen to anyone, including the person reading these words.

[31] Federal Emergency Management Agency, Emergency Management Guide for Business, (FEMA Publication 141, Introduction) See: http://www.fema.gov/business/guide/index.shtm

Additional Resources

DHS Disaster Preparedness Sites

http://www.ready.gov/business/
https://www.disasterhelp.gov/suite/

U.S. Small Business Administration

http://www.sba.gov/services/disasterassistance/disasterpreparedness/index.html

FEMA Disaster Preparedness

http://www.fema.gov/areyouready/

SCORE

http://www.score.org/disaster_preparedness.html

Hewlett-Packard (HP)

http://www.hp.com/sbso/serverstorage/ultimate/disaster-recovery.html

Insurance Information Institute

http://www.iii.org/

National Federation of Independent Business (NFIB)

http://www.nfib.com/object/IO_30833.html

NOAA Weather Statistics

http://www.nws.noaa.gov/om/hazstats.shtml

National Data Awareness Project

http://ndap.datainstitute.org/portal/

Data Management Institute

http://www.datainstitute.org/portal/

Disaster Recovery Planning Organization

http://www.drplanning.org/portal/

Disaster Recovery Institute

http://www.drii.org/DRII/

Ready America

www.ready.gov

For more information

www.hp.com/sbso

Supplemental Workpapers for Workpaper 2IN004

Footnote No. 104

Business Insider

18 Amazing Facts about Small Businesses in America

The entire document is available upon request.

BUSINESS INSIDER

18 Amazing Facts About Small Businesses In America

AIMEE GROTH AND KIM BHASIN
AUG. 24, 2011, 3:30 PM

Ryan Ozawa via flickr

Every major company was once a small business. Consider the garage days for the founders of Microsoft and Apple.

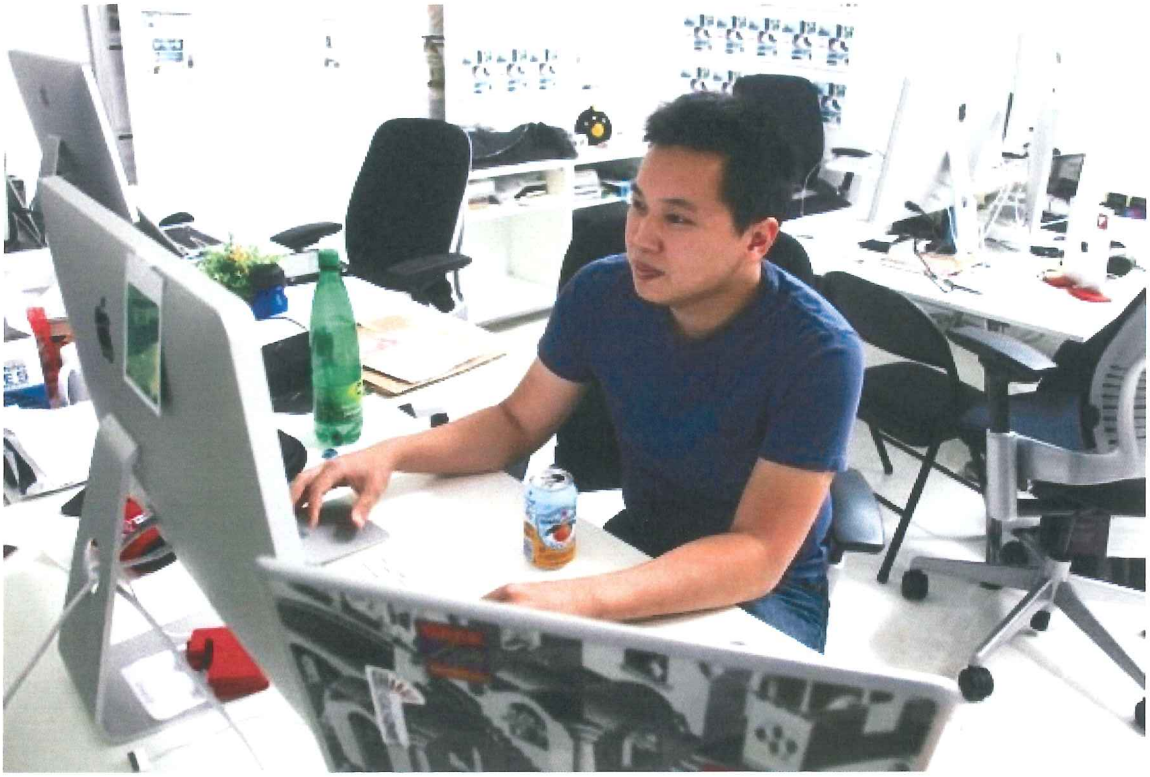
"You need a lot of passion for what you're doing because it's so hard," Steve Jobs once said. "Without passion, any rational person would give up."

After all, bootstrapping a startup is one of the quintessential elements of the American dream.

A small business is defined broadly -- as a company with 500 or fewer employees, but it varies by industry; the Small Business Association breaks it down here.

Chances are you -- and most people you know -- work for one.

70% of small businesses are owned and operated by a single person



Dan Frommer, Business Insider

Source: United States Small Business Association Office of Advocacy

Supplemental Workpapers for Workpaper 2IN004

Footnote No. 112

Accenture

The New Energy Consumer Handbook

The entire document is available upon request.

accenture

consulting | technology | outsourcing

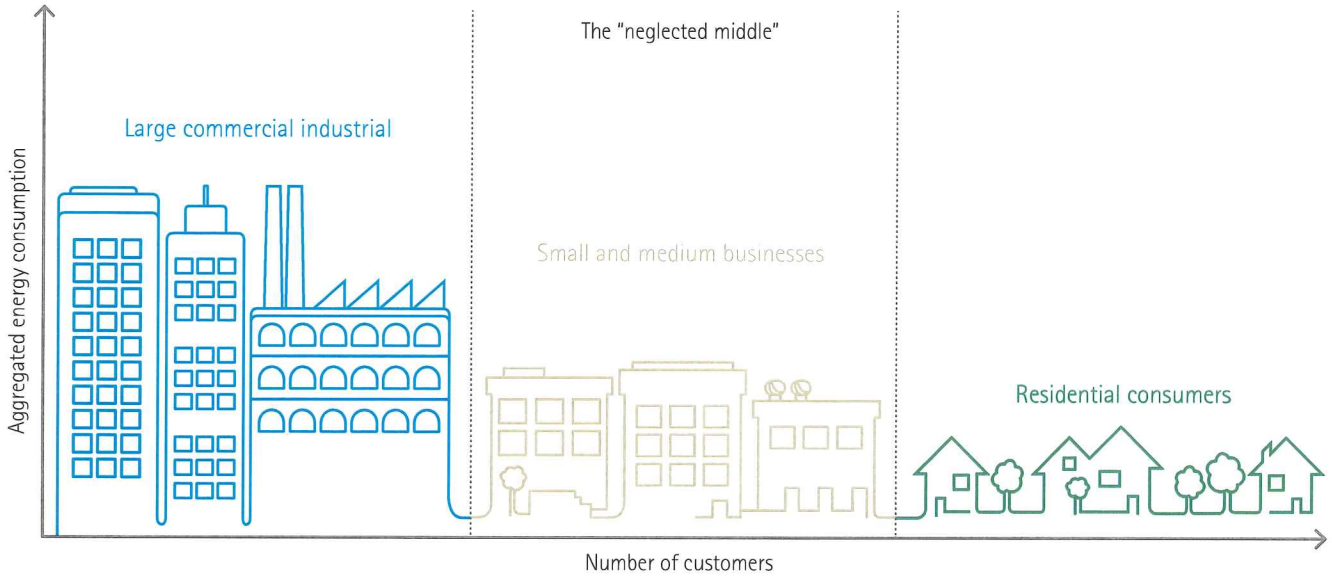
The New Energy Consumer Handbook

The untapped energy consumer

Residential consumers—due to their vast numbers—and commercial and industrial consumers that often have significant energy demands, have long been key groups for most energy providers. Whether enhancing customer service, promoting energy conservation or offering new products and services, energy providers have often devoted significant attention and investment to these consumers. However, in the new energy marketplace, the next big opportunity to create and capture value will likely come from a different group: small and medium businesses.

SMBs may not be the largest commercial consumers when it comes to energy usage or as numerous as residential consumers. However, they represent a significant proportion of an energy provider's consumer base and in many cases have long been a "neglected middle" that offer untapped potential (see Figure 59). In fact, nearly 90 percent of US businesses have fewer than 20 employees, and 3.6 million of those companies have fewer than five employees.[248] Around the world, there are an estimated 125 million SMBs in operation and they employ more than one-third of the world's labor force.[249] In other words, SMBs represent a big opportunity.

Figure 59. Small and medium businesses have traditionally been the "neglected middle" and offer a significant opportunity.



*Illustrative example of energy provider market breakdown

Supplemental Workpapers for Workpaper 2IN004

Footnote No. 114 & 115

Utility Analytics Institute

Customer Targeting and Segmentation Analytics – Satisfying Customers as Individuals

The entire document is available upon request.

2013

Customer targeting and segmentation analytics

Satisfying customers as individuals

A Utility Analytics Institute publication

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Segmentation efforts range from those that are focused on managing the overall utility-customer relationship to very specific segmentation efforts designed to support the marketing of a particular product or program or the prioritization of credit and collections efforts. The benefits of segmentation also extend beyond customers. For example, segmentation of buildings can be a valuable input for a utility's energy efficiency strategy.

Customer targeting

Customer targeting is the process of applying customer segmentation to specific marketing initiatives or campaigns. Some campaigns may target more than one customer segment. The idea is to improve marketing efficiency by focusing marketing efforts and resources on those customers most likely to, for example, benefit from a particular product, enroll in a particular program, or pay an outstanding balance.

"The benefits of segmentation extend beyond customers."

Customer marketing

Customer marketing involves a number of components and encompasses both customer segmentation and customer targeting. In general, customer marketing includes four elements, the 4 P's of marketing:

- **Product** | This includes product concept, selection, defining the value proposition and product development
- **Price** | Determination of a product's price
- **Place** | Selection of the distribution channels that will be used to reach customers
- **Promotion** | The design and execution of a promotional strategy

WHY CUSTOMER TARGETING AND SEGMENTATION?

So that's a little bit about the areas we'll cover, but these can feel like somewhat new areas for utilities, so let's take a look at why utilities care about this it. The retail, financial and telecommunications industries have long-focused on customer analytics to survive in a world of cut-throat competition. For example, telecommunications providers are willing to invest in segmentation and targeting analytics to avoid customer churn, since bringing a customer onboard can cost upwards of $500 per person.

With the exception of deregulated utility markets, most utilities in North America just haven't faced this intense competition that drives many companies to invest in customer analytics. Historically, electric utilities delivered one thing: electricity, to one group: everyone. Utilities primarily focused on the meter-to-cash process, for example, with efforts such as how to improve billing or offer more efficient customer service. Traditional customer information and relationship management systems provided much of what utility companies needed.

However, times are changing. New data, new programs, new pricing and even new competition—think solar energy providers—are changing the customer analytics scene for most utility companies. Utilities offer so many programs—from time-of-use pricing to demand response—and there are more coming onboard every day with the onslaught of green energy programs, and the potential of home energy management systems and electric vehicles. Directing these numerous programs to the right target markets could ensure greater participation and help utilities save on marketing costs. It is also important that utilities know, for example, when to stop spending on customers who won't act or stop over-marketing to customers who will act on their own.

A dynamic, growing list of analytics needs for customer marketing and segmentation include:

- Identifying customer segments, values and behaviors
- Delivering appropriate marketing messages that resonate with the right customer segments
- Improving customer participation in a variety of utility programs—including energy efficiency and dynamic pricing programs
- Increasing customer retention in deregulated markets
- Understanding and responding to customer and community sentiment about the utility company, including the understanding and acceptance of smart meter and smart grid technologies

how utilities are using it

With these drivers pushing utilities ahead with customer targeting and segmentation, let's see what they're actually doing with targeting and segmentation. In this section, we'll look at:

- Targeting and segmentation status and resources
- Customer criteria usage
- Segmentation usage
- The role of predictive analytics

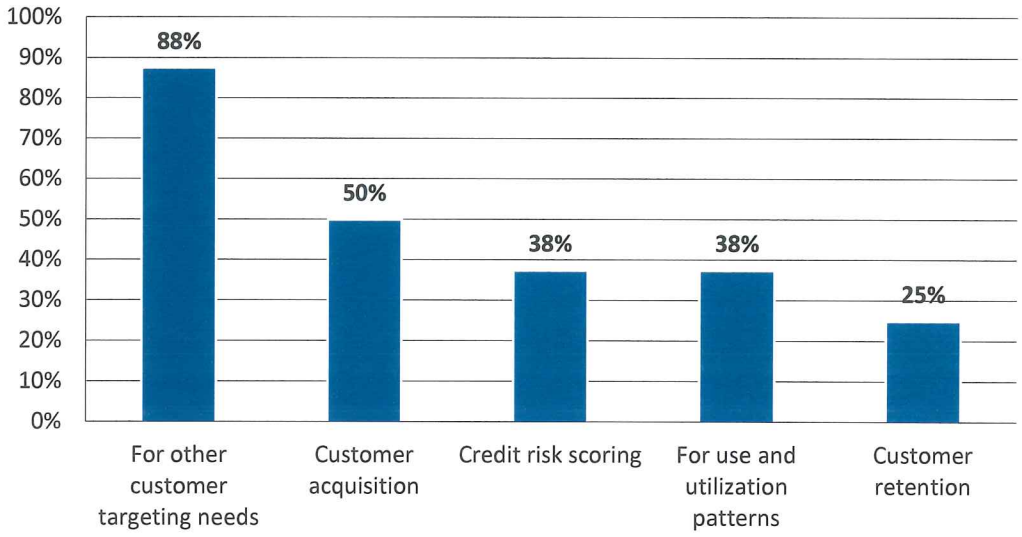
TARGETING/SEGMENTATION STATUS AND RESOURCES

According to utility respondents in our customer marketing and segmentation working group survey, most utilities have some segmentation/targeting framework in place. As shown in Figure 1, these frameworks are most likely to be in place for residential customers as opposed to commercial customers—although commercial is not far behind. This is all happening in spite of the fact that 93% of our respondents haven't developed a business case surrounding segmentation and targeting.

THE ROLE OF PREDICTIVE ANALYTICS

A wrinkle in the customer targeting and segmentation efforts we discussed above is whether these efforts are working on predictive analytics, or more historical reporting efforts. We found that 62% of survey respondents use predictive analytics for their targeting and segmentation. But it wasn't entirely clear what the key areas are for predictive analytics. In Figure 9, respondents most frequently reported that they use predictive analytics for "other customer targeting needs." This finding likely points to the fact that uses for predictive analytics aren't clearly defined just yet, and will likely continue to evolve over the next several years. This is something we'll need to explore more in future research.

Figure 9. How do you utilize predictive analytics?



N = 8 *Source: Utility Analytics Institute, Customer marketing and segmentation working group survey*

utility story time

We've discussed where the industry is at—and where it's heading—with customer targeting and segmentation analytics. Now, we'll dive deeper and look at specific stories of how utilities are embracing the power of customer targeting and segmentation analytics. For each of these stories we'll explore the technology, business process change, strategy and people associated with the utility's customer targeting and segmentation analytics project. Our featured utility stories include:

- Consumers Energy | Brand awareness analytics
- PG&E | Customer segmentation analytics
- Seattle City Light | Conservation program analytics
- SDG&E | Customer marketing analytics
- National Grid | Customer engagement analytics

PG&E | CUSTOMER SEGMENTATION ANALYTICS

Pacific Gas & Electric (PG&E) has completed its customer segmentation project designed to improve the utility's understanding of its small- and medium-sized business (SMB) customers by industry segment, particularly as they relate to energy efficiency products and programs.

This overall segmentation will be valuable to future energy efficiency program marketing campaigns. Subsequent analytics projects will build on the insight gained and determine which products should be targeted to which customers. The results of this segmentation project are also expected to inform the design and development of future energy efficiency programs for this market. Ultimately, the hope is to grow energy efficiency program adoption and improve customer satisfaction.

The costs specific to this effort were not tracked. At a high level, the initiative required about two resources on a part-time basis over a six-month period. There were also vendor costs related to acquiring, organizing, and analyzing the data.

Business drivers

PG&E was experiencing low customer satisfaction scores, and these results were attributed to a number of causes including some negative press. In response, the utility began a number of initiatives. Energy efficiency programs have long been viewed by PG&E as a tool that can be used to improve customer satisfaction, and PG&E desired to renew its focus on targeting SMB customers. This project emerged as a result.

PG&E also desired to better understand how well PG&E's energy efficiency programs performed in each SMB segment and identify those performing well versus those offering opportunities for improvement.

Technology

PG&E relied primarily on TargetBase—a data warehouse provider—to acquire, organize and analyze the data. The utility also performed analysis on additional data available internally using Microsoft Excel.

The TargetBase data warehouse contains a substantial amount of data about PG&E's customers including:

- Customer size
- Electric and gas consumption information
- Electric and gas billing information
- Geographic region(s)
- Energy efficiency program participation
- Number of times participating in a program
- Number of specific rebates earned
- Percentage of participation by segment

TargetBase integrated external industry segment data and did analysis to determine the number of customers participating by industry segment, customer size and geographic area. TargetBase also provided bill summary information by segment.

PG&E provided bill impact analysis data, performed additional data analysis, and scored and ranked each segment based on two categories of metrics—performance and opportunity. Once ranked by performance and opportunity, the segments that scored highly in opportunity became focus areas. Within these, the ones that also scored high in performance were used as examples of what PG&E had done well and best practices. The ones that scored low in performance were identified as segments that merited additional marketing focus by PG&E.

The results were detailed in a presentation to PG&E's sales, marketing and product organizations. The results highlighted opportunities to improve performance and increase energy efficiency program adoption. There were significant differences by geographic area and by segment. Adoption rates varied. It was evident that some products work and some don't for particular segments.

Business process

This project did not directly make a substantial impact on PG&E business processes though it may indirectly result in other projects that will drive process change.

The PG&E sales folks and product managers are expected to use this data to prioritize customer segments. The insight gained will spur additional projects aimed at determining which products should be targeted to which segments. Project results will also feed marketing collateral and online tools for customers as well as auditing tools.

"This project has contributed to a substantial increase in customer satisfaction over the past year."

It is expected that subsequent projects related to energy efficiency program targeting and design will foster more collaboration between PG&E leadership, marketing, sales and product teams.

ROI has not been tracked for this project. Going forward, it would be possible to use the results of this project as a baseline to measure success in terms of participation rates or other metrics if the results were updated. The good news is that the projects that PG&E initiated to improve customer satisfaction scores, including this one, have contributed to a substantial increase in customer satisfaction over the past year.

Strategy

Becoming more customer-focused and using energy efficiency to drive customer satisfaction are strategically important business objectives at PG&E. This initiative aligns well with those objectives.

PG&E is committed to using data to support decision making and is becoming a more data-driven company. The utility is investing in resources to support that objective.

People

This project did not have a specific technology or business lead and instead was pursued by a small team working together. The title of the executive sponsor of this initiative was energy efficiency products senior director.

TargetBase acquired and organized the data and completed a significant amount of the data analysis.

In total, four analysts and a consultant were involved on a part-time basis though most of the work was performed by two of the analysts. Other PG&E resources helped to integrate the information and distribute the results to the appropriate individuals across the organization.

This project was primarily about information and insight and as such did not create the need for change management. PG&E does have a change management group that project teams can engage as needed.

SEATTLE | CONSERVATION PROGRAM ANALYTICS

Seattle City Light's (SCL) conservation resources division began a customer segmentation project in 2010 to support customer marketing initiatives. The project discussed here, is a building segmentation project, which is an outgrowth of that effort. This analytics project seeks to understand the characteristics of buildings within SCL's service area and better support conservation programs.

The conservation field operations group does projects in buildings that customers own, lease or rent. Prior to this effort, the utility was unable to answer basic questions about these building segments. For example:

- How many restaurants are there?
- What is the square footage of these restaurants?
- How many projects has the utility taken on in restaurants?
- What percentage of restaurant square footage has been addressed by a conservation project?

If the utility has only touched 20% of restaurant square footage, then this segment likely justifies additional attention. If 80% of restaurant square footage has been addressed by a project, then the utility may want to focus on another building segment.

SCL has worked with a vendor to complete a conservation potential assessment (CPA). The CPA examines where energy is going today and identifies the potential for future energy savings in each building segment.

"This project will allow SCL to understand the actual energy use by building segment and the penetration of energy conservation measures by each type of building."

However, the utility currently relies on other data sources to make an educated guess about how many customers are in each segment. This project will allow SCL to understand the actual energy use by building segment and the penetration of energy conservation measures (ECM) by each type of building.

SCL will be able to compare how much energy is used by each segment to actual square footage, and see the projects that were completed by each segment. (e.g. restaurants, hotels, office buildings) Questions such as "How many projects have we completed in each segment?" will no longer remain unanswered.

The primary benefits of this project will be:

- More effective development and execution of marketing campaigns
- Input for conservation program design and development
- Improved accuracy of the conservation potential assessment (the vendor responsible for the assessment will be able to tighten up its model and improve the accuracy of the output)

Thus far, SCL has invested about $150K in this project for the services of a third-party vendor. SCL's vendor is aligning the data and building the client interface needed to support queries of needed information. On an annual basis, SCL will pay an annual data subscription fee of more than $40K. The above numbers do not include the internal resource time.

Business drivers

There were two primary drivers behind this initiative:

- Improve customer segmentation and get a better handle on the mix of customers served and the projects completed for them
- Leverage existing data by adopting common definitions, aligning information from disparate systems, and making the information easily accessible to enable effective analysis of the data

The current situation is extraordinarily challenging. Two separate databases contain information about commercial customers—one with information about medium to large commercial customers and the other with information about small commercial customers. The data definitions and the reports associated with each are completely different making meaningful analysis difficult. In addition, SCL's energy management analysts (EMA), who work in the field, have adopted one set of building definitions and these databases rely on two completely different definitions.

Technology

At this point, all of the data is being consolidated into a Microsoft Access database. The vendor referred to previously is in the process of aligning all of the data. When a common data field exists, this data mapping is rel-

atively straightforward, but is extremely complex when common data fields do not exist. SCL is working closely with their vendor to develop the business rules necessary to effectively reconcile this data. Primary data sources include the following:

- Billing system data known as Consolidated Customer Service System (CCSS), an Oracle platform
- Commercial Acquisition Tracking System (CATS) data—the small commercial and multi-family tracking database referred to above that is also Oracle-based
- Commercial & Industrial Tracking System (CITS) data—the large commercial and industrial customer database referred to above, which is a Microsoft Access database

The address for a customer in CITS is often not consistent with CCSS. While CATS and CCSS can communicate with each other, CITS is not able to communicate with either system. EMAs must access CITS or CATS to obtain information about a particular building and then access CCSS for certain customer information. While project information and kWh savings and incentives reside in CATS and CITS, neither provides any information about the customer's building. That information (e.g. square foot, floors, type of building, type of construction, year built, and heating system information) can be found in the King County Tax Assessor database. The result is that the EMAs spend too much time accessing often inconsistent data and not enough time talking with customers.

SCL's vendor is working to integrate all of this information and combine it with data from proprietary databases that contain other valuable information (e.g. the number of employees for each business, how long in business, key contact information).

At the conclusion of this project, it should be possible to produce a building profile that helps SCL understand the building details and who are the tenants within each particular building. This will enable the utility to better understand its customers and how they use energy.

Ultimately, a front end to access this information will be needed. A decision has not yet been made regarding that front end nor is that project funded. The current Microsoft Access interface will not be effective for the widespread use envisioned. A cloud-based solution that can be easily accessed and used by EMAs in the field would be ideal.

Business process

This project has served to highlight gaps in existing processes and information as well as the need for business process change. The need to collect and consolidate more information about both buildings and customers is evident.

Moving to an account number-based structure is one process change being contemplated—CATS has account numbers and CITS does not—as data that is not consistently organized or easily accessible provides little value. Processes will need to change to support data reporting and analysis that in turn will allow SCL to enhance conversations with customers about energy conservation program options.

While it is too early in this project to identify specific examples, it is expected that eliminating data siloes will promote collaboration and enable business process integration. ROI has yet to be determined. The returns achieved will most likely accompany the business process changes that occur as a result of this project.

Strategy

This project clearly aligns with SCL's overall objectives around improving operational efficiency and customer satisfaction. JD Power customer satisfaction measures are of primary importance. This project will attempt to get under those numbers and provide a better understanding of SCL's customers and their energy needs. In turn, it will be possible to develop a strategy to meet the specific needs of each customer segment.

People

The title of the technology and business lead for this project is the energy planning analyst. The next step in this project involves going through the procurement process and obtaining sponsorship. A proposal will be made to the director of the conservation resources division seeking executive sponsorship and buy-in to proceed with issuing an RFP for the cloud-based solution referenced above.

This project would not have been possible without the help of an outside vendor. SCL defined the strategy and business requirements. The vendor is designing, developing, and implementing the solution based upon that direction.

The internal resources involved in this project thus far include the energy planning analyst mentioned above—with roughly 120 hours invested managing weekly meetings, developing the RFP, reviewing customer information and so on—and a planning and development specialist with knowledge of SCL's systems, IT infrastructure, applications and billing system with roughly 50 hours invested.

Others have been involved on a part-time basis, and a new hire familiar with databases is expected to become involved going forward.

A change management framework is not yet in place and will need to be addressed as the project moves forward.

SDG&E | CUSTOMER MARKETING ANALYTICS

San Diego Gas & Electric (SDG&E) has embarked on an effort to use the interval data from smart meters to better target demand response programs. The initial focus will be on A/C and pool pump load management programs. Smart meter data will be analyzed in order to identify the best possible targets for these particular programs. An equally important objective of this initiative is to reduce or eliminate "free ridership," or customers that disconnect the equipment required and yet still benefit from reduced rates—through improved demand response compensation and control processes.

This project was enabled by the $500 million+ investment SDG&E made in deployment of smart meters. The incremental cost related to this initiative was minimal.

Business drivers

SDG&E's goal is to shift peak load on high-load. The objective of this initiative is to use the interval data available from smart meters to optimize demand response programs. SDG&E also hopes to improve marketing efficiency and customer satisfaction by targeting the right customers for the right programs.

SDG&E has historically relied on mass marketing to promote its demand response programs. Marketing of demand response programs has not been tailored specifically to those customers most likely to benefit and able to contribute to SDG&E's efforts to shift peak load. Heavy users of A/C should be targeted for and receive the discounts offered by an A/C load program versus those customers who either do not have an A/C or never run it. SDG&E also hopes to address problems related to "free ridership" through better customer segmentation and targeting.

Technology

The primary hardware associated with this initiative includes Itron's smart meters and SDG&E's communications infrastructure. An Oracle data warehouse and Itron's meter data management system (MDM) are the primary software components. Detectent is performing the advanced data analytics in connection with this effort.

Smart meter data passes through MDM and is integrated with other SDG&E data via the Oracle data warehouse and exported to Detectent. Detectent appends customer demographic data and other third-party data, (e.g. house size) and analyzes the data.

Data sources include smart meter data, weather data, and customer information system data. (e.g. does the customer participate in SDG&E's A/C load cycling program? Did they purchase a variable speed pool pump? Is the customer on a tiered rate or time-of-use rate plan?)

Business process

Though these changes have yet to occur, this initiative will change marketing and customer outreach processes for SDG&E's A/C load cycling program and pool pump program. The initiative will also impact how SDG&E compensates those participating in these programs and how it detects "free riders." It is also anticipated that the insight gained will provide valuable input to future program design and how programs are packaged and offered.

Beyond this initiative, there is also a substantial customer segmentation effort underway at SDG&E. Products and services will be marketed to customers based on the different customer segments identified. This is a significant shift as in the past the only real segmentation used was residential versus commercial and industrial customers.

It is too early in the process to report an ROI. SDG&E intends to measure the return and are hoping to calculate by the end of the 2013.

People

The technology and business lead for this initiative is SDG&E's manager of customer programs. The executive sponsor for this project is the vice president of customer services.

Detectent assisted with design and launch of this initiative. The initiative began with a pilot several months ago. SDG&E sent data to Detectent, and they demonstrated the ability to detect A/C and pool pump load analyzing the provided data. As a result of the pilot's success, SDG&E decided to move forward with this initiative. The remainder of the work associated with this initiative was performed in-house by SDG&E resources.

At this point, the utility does not have dedicated staff resources assigned to this effort, though a number of individuals have been involved and the total time of their involvement is estimated to be one FTE.

The project plan does anticipate the need for change management though the specific are yet to be determined. At this stage, SDG&E needs to see where the analysis leads and substantiate the value. From there, the company can determine how it will implement and develop actions to address the process and change management needs that result from the initiative.

Supplemental Workpapers for Workpaper 2IN004

Footnote No. 116

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Aging Changes in Senses

URL of this page: http://www.nlm.nih.gov/medlineplus/ency/article/004013.htm

Aging changes in the senses

As you age, the way your senses (hearing, vision, taste, smell, touch) give you information about the world changes. Your senses become less sharp and you may have trouble telling apart details.

Sensory changes can affect your lifestyle. You may have problems with communicating, enjoying activities, and staying involved with people. Sensory changes can lead to isolation.

Your senses receive information from your environment. This information can be in the form of sound, light, smells, tastes, and touch. This information is converted to nerve signals and carried to the brain. There, it is turned into a meaningful sensation.

A certain amount of stimulation is required before you become aware of a sensation. This minimum level is called the threshold. Aging increases this threshold. So the amount of stimulation needed for you to be aware of the sensation becomes greater.

All senses can be affected by aging, but hearing and vision are most affected. Many of these changes can be offset with equipment such as glasses and hearing aids or by changes in lifestyle.

Hearing

Your ears have two jobs. One is hearing and the other is maintaining balance. Hearing occurs after sound vibrations cross the eardrum to the inner ear. The vibrations are changed into nerve signals in the inner ear and carried to the brain by the auditory nerve.

Watch this video about:
Hearing and the cochlea

Balance (equilibrium) is controlled in the inner ear. Fluid and small hairs in the inner ear stimulate the auditory nerve. This helps the brain to maintain balance.

As you age, structures inside the ear start to change and their functions decline. Your ability to pick up sounds decreases. You may also have problems maintaining your balance as you sit, stand, and walk.

Age-related hearing loss is called presbycusis. It affects both ears. Hearing may decline, especially of high-frequency sounds. You may also have trouble telling apart certain sounds. Or, you may have problems understanding others when there is background noise. If you are having trouble hearing, discuss your symptoms with your health care provider. Ways to manage hearing loss include being fitted with a hearing aid.

Persistent, abnormal ear noise (tinnitus) is another common problem in older adults. Cause of tinnitus may include wax buildup or medicines that are harmful to the structures inside the ear. If you have tinnitus, talk with your health care provider about how to manage the condition.

Impacted ear wax can also cause trouble hearing and is common with increasing age. Impacted ear wax can be removed by your health care provider.

Vision

Vision occurs when light is processed by your eye and interpreted by your brain. Light passes through the transparent eye surface (cornea). It continues through the pupil. This is the opening to the inside of the eye. The pupil becomes larger or smaller to control the amount of light that enters the eye. The colored portion of the eye is called the iris. It is a muscle that controls the pupil size. After light passes through your pupil, it reaches the lens. The lens focuses light on your retina (the back of the eye). The retina converts light energy into a nerve signal that is carried by the optic nerve to the brain where it is interpreted.

Watch this video about:
Seeing

All of the eye structures change with aging. The cornea becomes less sensitive, so injuries may not be noticed. By the time you turn 60, your pupils decrease to about one third of the size they were when you were 20. The pupil may react more slowly in response to darkness or bright light. The lens becomes yellowed, less flexible, and slightly cloudy. The fat pads supporting the eyes decrease in amount and the eyes sink into their sockets. The eye muscles become less able to fully rotate the eye.

As you age, the sharpness of your vision (visual acuity) gradually declines. The most common problem is difficulty focusing the eyes on something close. This condition is called called presbyopia. Reading, or bifocal, glasses or contact lenses can help correct presbyopia.

You may be less able to tolerate glare. Glare such as from a shiny floor in a sunlit room can make it difficult to get around indoors. You may have trouble adapting to darkness or bright light. Problems with glare, brightness, and darkness means you may need to give up driving at night.

As you age, it gets harder to tell apart blues and greens than it is to tell apart reds and yellows. Using warm contrasting colors (yellow, orange, and red) in your home can improve your ability to see. Keeping a red light on in darkened rooms, such as the hallway or bathroom, makes it easier to see than using a regular night light.

With aging, the gel-like substance (vitreous) inside your eye starts to shrink. This creates small particles called floaters in your field of vision. In most cases, floaters do not reduce your vision. But if you develop floaters suddenly or have a rapid increase in the number of floaters, you should have your eyes checked by a professional.

Reduced peripheral vision is common in older persons. This can limit activity and ability to interact with others. You may not communicate even with persons sitting next to you because you cannot see them well. Driving can become dangerous.

Weakened eye muscles may not allow you to move your eyes in all directions. Looking upward may be limited. The area in which objects can be seen (visual field) gets smaller.

Aging eyes do not produce enough tears. This leads to dry eyes. Left untreated, infection, inflammation, and scarring of the cornea can occur. Dry eyes can be relieved by using eyedrops or artificial tears solutions.

Common eye disorders in the elderly (changes that are not normal) include cataracts, glaucoma, macular degeneration, and diabetic and hypertensive retinopathy.

If you are having vision problems, discuss your symptoms with your health care provider.

Taste and Smell

The senses of taste and smell work together. Most tastes come from odors. The sense of smell begins at the nerve endings high in the lining of the nose.

Watch this video about:
Smelling

You have approximately 9,000 taste buds. Your taste buds are responsible for sensing sweet, salty, sour, and bitter tastes.

Watch this video about:
Tasting

Smell and taste play a role in enjoyment and safety. A delicious meal or pleasant aroma can improve social interaction and enjoyment of life. Smell and taste also allow you to detect danger, such as spoiled food, gases, and smoke.

The number of taste buds decreases as you age. Each remaining taste bud also begins to lose mass (atrophy). Sensitivity to the four tastes often declines after age 60. Usually salty and sweet tastes are lost first, followed by bitter and sour tastes. In addition, your mouth produces less saliva as you age. This causes dry mouth, which can affect your sense of taste.

Sense of smell can diminish, especially after age 70. This may be related to loss of nerve endings in the nose and to less mucus being produced in the nose. Mucus helps odors stay long enough to be detected by the nerve endings. It also helps clear odors from the nerve endings.

Certain things can speed up the loss of taste and smell. These include diseases, smoking, and exposure to harmful particles in the air.

Decreased taste and smell can lessen your interest and enjoyment in eating. Risk of danger is increased because a person cannot smell odors such as natural gas or even smoke from a fire just starting.

If your senses of taste and smell have diminished, talk to your health care provider. There may be help. For example:

- Some medicines can alter your ability to smell and taste things. Changing your medicine may improve this.
- Sometimes changes in the way food is prepared, such as using different spices can help.
- To ensure your safety, look into buying products such as a gas detector that gives off alarms you can see and hear.

Touch, Vibration, and Pain

The sense of touch also includes being aware of pain, temperature, pressure, vibration, and body position. Skin, muscles, tendons, joints, and internal organs have nerve endings (receptors) that detect these sensations. Some receptors give the brain information about the position and condition of internal organs. Though you may not be aware of this information, it helps to identify changes (for example, the pain of appendicitis).

Your brain interprets the type and amount of touch sensation. It also interprets the sensation as pleasant (such as being comfortably warm), unpleasant (such as being very hot), or neutral (such as being aware that you are touching something).

Watch this video about:
Feeling pain

With aging, you may have reduced or changed sensations. These changes can be related to decreased blood flow to the nerve endings or to the spinal cord or brain. The spinal cord transmits nerve signals and the brain interprets the signals.

Health problems such as lack of certain nutrients can also cause sensation changes. Brain surgery, problems in the brain, confusion, nerve damage from injury or chronic diseases such diabetes can also result in changes in sensation.

Symptoms of changed sensation vary based on the cause. With decreased temperature sensitivity, it can be hard to tell the difference between cool and cold and between hot and warm. This can increase risk of injury from frostbite, hypothermia (dangerously low body temperature), and burns.

Reduced ability to detect vibration, touch, and pressure increases the risk of injuries, including pressure ulcers. After age 50, many people have reduced sensitivity to pain. Or you may feel and recognize pain, but it does not bother you. For example, when you are injured, you may not know how severe the injury is because the pain does not trouble you.

You may develop problems with walking because of reduced ability to perceive where your body is in relation to the floor. This increases your risk of falling, a common problem for older people.

Older persons can develop an increased sensitivity to light touch because of thinner skin.

If you are having symptoms of changes in touch, pain, or problems standing or walking, talk with your health care provider. There may be ways to manage the symptoms.

The following measures can help you stay safe:

- Adjust hot water heater temperature to no higher than 125°F (51°C) to avoid burns.
- Check the thermometer to decide how to dress rather than waiting until you feel overheated or chilled.
- Inspect your skin, especially your feet, for injuries. If you find an injury, treat it. Do not assume that because an area is not painful, the injury is not significant.

As You Grow Older, You Will Have Other Changes, Including:

- In organs, tissues, and cells
- In skin
- In the bones muscles, and joints
- In the face
- In the nervous system

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Supplemental Workpapers for Workpaper 2IN004

Footnote No. 117

Outcome & Insights in Health Management

Estimating the Impact of Caregiving and Employment on Well-Being

OUTCOMES & INSIGHTS
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Estimating the Impact of Caregiving and Employment on Well-Being

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ABSTRACT

The aging demographic profile of the American population coupled with the increased burden of chronic disease is increasing the demand for care – both within the healthcare system and within the home. As a result of these trends, a large proportion of the population is facing the competing demands of working and caring for a loved one. In the study presented here, we investigated the impact of informal caregiving, employment, and the combination of these responsibilities on the overall well-being of 243,997 Americans surveyed using the Gallup-Healthways Well-Being Index™ (GHWBI). Results demonstrated that caregivers typically have lower levels of well-being compared with non-caregivers of the same employment status; however, employment is associated with greater well-being, even among caregivers. These findings were fairly consistent across all sub-domains of well-being, demonstrating that employment has a broad-based positive affect on the lives of workers, and that the beneficial impact of employment on well-being often supersedes any detrimental impact of caregiving. In conclusion, the higher well-being reported by employed caregivers compared with their non-employed counterparts suggests that there are benefits of employment, such as financial security and social support, that can ease the burden of the caregiving role.

INTRODUCTION

The aging of the baby boomer generation is rapidly changing the age profile of the United States. Between the years of 2000 and 2030, the number of Americans over 65 will more than double, increasing from 35.1 million in 2000 (12.4 percent of the population) to 71.5 million in 2030 (19.6 percent of the population).[1] Further, this group will be increasingly burdened by chronic disease that can be physically disabling.[2] Despite chronic disease trends, longevity continues to increase over time. Life expectancy data from the Centers from Disease Control shows progressive increases over only twenty years (1986, 74.7 yrs; 1996, 76.1 yrs; 2006, 77.7 yrs).[3] The interplay of these trends leads to the logical conclusion that there is a large and growing elderly population with demanding care needs that extend for many years.

Of the approximately 52 million Americans who act as a caregiver to an adult who is ill or disabled,[4] approximately 59% are employed.[5] Although more women than men still play this role (59% to 75%), there was a 50% increase in the number of male caregivers over the ten year period from 1984 to 1994.[6] That so many Americans must balance their responsibilities as an employee and as a caregiver with their day-to-day lives and other family responsibilities raises the question of how individuals are affected by these roles.

Previous research has demonstrated that work performance is diminished when an individual takes on the role of caregiver. A positive correlation exists between work productivity loss and caregiving-related strain, an effect heightened with intensity of caregiving and the medical care needs of the care-recipient. Caregiving has shown to reduce work productivity by 18.5%[7] and increase the likelihood of leaving the workforce.[8] Further, this responsibility takes a toll on a caregiver's life outside the workplace. Caregivers, regardless of employment status, report that productivity in activities of daily life is reduced by 27.2% as a result of caregiving responsibilities,[7] and that the effect on personal life is 3 or more times greater than the effect on employment.[9]

Prior research has shown that caregiving does not affect all caregivers equally since the demands of the role vary widely.[7] Caregiving is a career in which level-of-effort progresses with time. As shown in Figure 1, caregiving often begins before a family member even recognizes that they are providing support with minor activities, such as simply 'checking in' with a loved one. As the older person becomes frailer, the need for support grows. In many cases, declining health or a catastrophic event, such as a fall, increase care requirements to include around-the-clock help with daily activities and home medical care.[10]

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Logically, as the caregiving career progresses in this manner, the increased demands would magnify the overall impact that this role has on many different aspects of the caregiver's life.

Existing research on the effects of caregiving has focused on specific elements of the caregiver's life, or on relatively small groups of caregivers that have certain characteristics. Using the Well-Being Index as a tool, this study is the first to demonstrate the impact that caregiving and employment have on well-being on a national level. Further, through analysis of specific elements of well-being, we provide a clear picture of the magnitude of effect on the constructs that contribute to overall well-being.

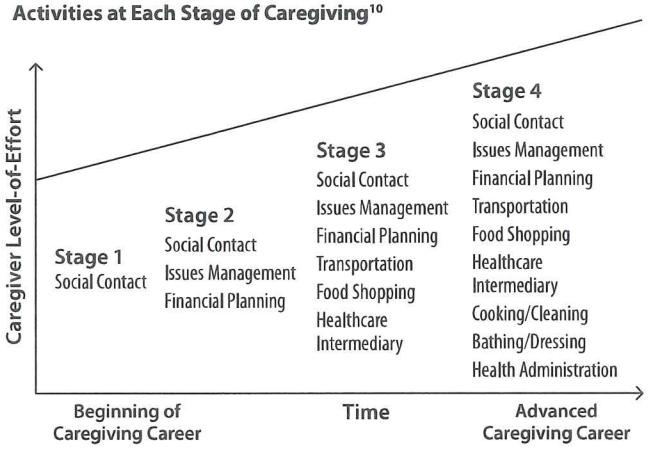
METHODS

Data Collection

Study data was collected between January 2 and December 31, 2008 using the Gallup-Healthways Well-Being Index (GHWBI) survey. The survey was administered telephonically by live interviewers employed by Gallup. Random digit dialing was used to reach individuals, via land lines or cell phones, throughout the United States. Only persons aged 18 years or more were eligible for the survey and the survey was administered in Spanish when necessary.

Interviewers completed approximately 1,000 surveys per day over the twelve month time period, working seven days a week from 4:00 PM to 9:00 PM, with the exception of holidays. A total of 355,334 surveys were completed. The interviewers completed each structured interview in 15 minutes, on average. Survey data was weighted by Gallup to match targets from the U.S. Census Bureau by age, region, gender, education, ethnicity, and race. The final weighted survey results used in this analysis are estimated to represent 98% of the full U.S. adult population with a margin of error of ± 0.2%.

FIGURE 1: The Caregiving Career: Activities at Each Stage of Caregiving[10]



Survey Tool

The GHWBI is a comprehensive assessment tool containing over 80 questions on evaluative and experienced measures of well-being, in alignment with previously published guidelines.[11,12] The survey is scored as a whole (composite score) and for each survey domain in which questions are categorized. These domains, or sub-indexes, are as follows.

Sub-indexes:

Life Evaluation Index: This index combines the evaluation of one's present life situation with one's anticipated life situation in 5 years and is based on Cantril's Self-Anchored Striving Scale.[13]

Emotional Health Index: This index reflects the daily affective experiences of survey respondents. It also includes one item that probes for prior history of diagnosed depression.

Physical Health Index: This index measures both acute and chronic disease as well as physical limitations, obesity, and energy level.

Healthy Behavior Index: This index evaluates lifestyle habits that affect health including smoking, healthy diet, fruit and vegetable intake, and exercise.

Work Environment Index: This index measures workers' feelings and perceptions about their work environment. The items cover job satisfaction, the ability to use individual strengths at work, and aspects of supervision. This sub-index score is only calculated for the percentage of the population that is working.

Basic Access Index: This index measures access to basic needs including food, shelter, and healthcare, a safe and satisfying place to live, and perceptions of the community.

The composite score and sub-index scores were calculated using the methodology described in the GHWBI Methodology Report.[14] Briefly, all items were scored on a 0 to 100 scale such that a higher score was indicative of higher subjective well-being for each of the sub-indexes. At the individual level, composite scores were calculated as the un-weighted average of all sub-index scores.

Study Population

The eligible population for this study (n = 243,997) included survey respondents of working age, between 18 and 64 years, and excluded all individuals with incomplete data. The study population was categorized into four groups for analysis: (1) individuals who were both caregivers and employed (n = 33,481); (2) individuals who were caregivers and non-employed (n = 12,817); (3) individuals who were non-caregivers and employed (n = 150,570); and (4) individuals who were non-caregivers and non-employed (n = 47,129). All analyses were performed using SAS software (SAS Institute Inc., Cary, NC). Although all reported data are weighted, reported sample sizes are un-weighted unless otherwise specified.

Analysis

Differences between group means were statistically tested using one-way Analysis of Variance (ANOVA). Since, using GHWBI guidelines, the composite score was calculated as a population metric, individual level scores were not initially available to conduct between-group analysis. Thus, for the purpose of comparing scores between the four groups, we modified the score calculation in order to create individual level scores and perform the ANOVA testing.

When comparisons using ANOVA proved significant, this test was followed with Tukey's multiple comparison test to determine which of the groups were significantly different from one another. Analysis of the Work Environment Index, for which the comparison included only two groups, was performed using an independent sample t-test.

In addition to evaluations of composite and sub-index scores, the four groups were further compared on specific individual survey items including rates of diagnosed depression, evaluation of standard of living, and mood. Statistical analysis of depression and standard of living was performed using Chi Squared tests; the mood analyses were descriptive in nature.

RESULTS

Among the study population, 75.4% were employed, 19.0% were caregivers, and 13.7% had both roles. Descriptive statistics and demographic information for each of the study groups are shown in Table 1.

TABLE 1: Study Group Characteristics and Weighted Demographics

	Caregiver		Non-Caregiver	
	Employed	Non-Employed	Employed	Non-Employed
N	*33,481*	*12,817*	*150,570*	*47,129*
%	*13.7%*	*5.3%*	*61.7%*	*19.3%*
Average Age	43.3	46.0	40.5	44.3
Gender (% Female)	51.8%	61.7%	43.9%	60.8%
Race				
Asian	1.4%	0.8%	1.8%	1.3%
Black	12.6%	14.4%	9.4%	11.8%
Hispanic	12.8%	12.6%	11.0%	15.1%
White	69.1%	67.5%	74.7%	68.3%
Other	4.1%	4.7%	3.1%	3.5%
Education				
Less than High School	7.7%	18.6%	5.6%	18.3%
High School Diploma	27.9%	35.0%	25.6%	33.4%
Tech/Voc School	7.2%	6.6%	6.5%	6.1%
Some College	24.6%	22.3%	24.2%	22.8%
College Graduate	18.0%	10.3%	21.7%	12.0%
Post Graduate School	14.7%	7.2%	16.4%	7.4%
Monthly Income				
Under $1,000	5.4%	26.0%	4.0%	26.2%
$1,000 to $1,999	13.6%	22.2%	10.9%	20.1%
$2,000 to $2,999	15.1%	14.5%	13.3%	13.6%
$3,000 to $3,999	13.3%	9.8%	12.6%	9.9%
$4,000 to $4,999	11.0%	7.4%	11.8%	7.3%
$5,000 to $7,499	18.5%	9.3%	21.0%	10.7%
$7,500 to $9,999	18.0%	3.3%	9.6%	4.0%
$10,000 and over	15.0%	7.5%	16.8%	8.3%
Marital Status				
Single	21.6%	22.7%	22.8%	23.1%
Married	57.4%	50.7%	58.9%	50.6%
Separated	2.8%	4.3%	2.2%	3.5%
Divorced	11.3%	13.4%	9.8%	12.9%
Widowed	1.9%	4.2%	1.6%	4.5%
Domestic Partner	4.9%	4.8%	4.7%	5.4%

Composite Well-Being Scores

Our analysis demonstrated that there was a significant group-level effect on composite scores, $p<0.0001$. Specific between group differences also proved significant. Table 2 outlines the weighted mean scores for each of the four study groups; as a benchmark for comparison, the population mean for all respondents (n = 355,334) during the same time period are shown. We found that both the employed caregiver and employed non-caregiver groups had a significantly higher composite mean than either the non-employed caregiver or the non-employed non-caregiver groups. Within each employment status, the composite mean for non-caregivers was significantly higher than for caregivers.

Sub-Index Scores

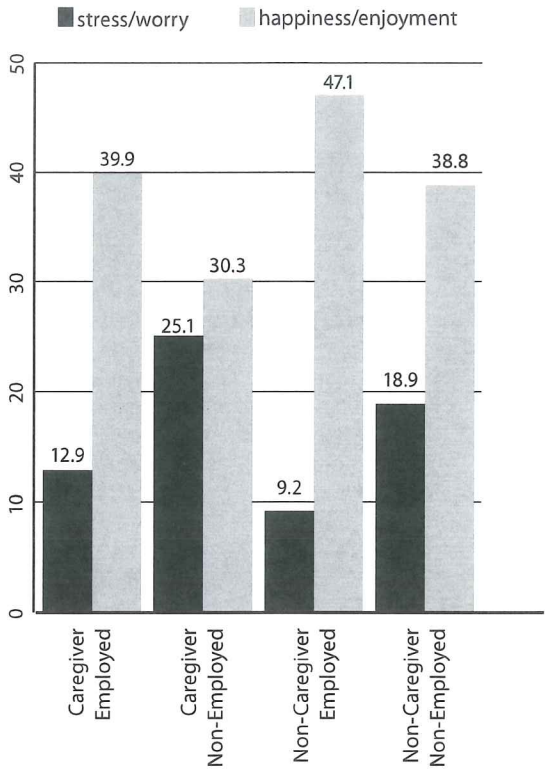
The group-level effect proved significant ($p< 0.0001$) for each of the domains of well-being. With the exception of the Healthy Behavior Index, average scores for these sub-indexes followed the same pattern as the composite score, and all between group differences were statistically significant. Scores on the Healthy Behavior Index were different from the other domains in that employed caregivers had higher average scores than employed non-caregivers, although these groups remained the top two in this score ranking. Additionally, for the Healthy Behavior Index the difference between the non-employed caregiver group and non-employed non-caregiver group means was not significant, as it was for the other sub-indexes.

Specific Survey Items

Daily Mood

The GHWBI defines daily mood by measuring the percentage of respondents who, on the day before they were surveyed, experienced a lot of happiness and enjoyment without a lot of stress and worry compared with the reverse of this – the percentage of individuals experiencing a lot of worry and stress without any happiness and enjoyment. Overall, a larger percentage of respondents in the employed non-caregiver group reported experiencing a lot of happiness and enjoyment and a lower level of worry and stress when compared to the other groups. The employed caregiver and non-employed non-caregiver groups had similar percentages reporting a lot of happiness and enjoyment; however, of these two groups the non-employed non-caregiver group had nearly a six percentage point higher rate of worry and stress. The non-employed caregiver group had the least favorable scores in both measures of mood (Figure 2).

FIGURE 2: Daily Mood Comparison



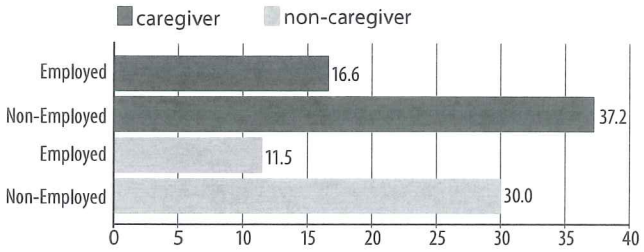
Depression

A comparison of the percent of respondents diagnosed with depression among the four groups found a significant effect ($p < .0001$); however, the effect size was small, V = .14. As shown in Figure 3, the non-employed caregiver group had a significantly higher percentage of individuals diagnosed with depression than any other group. The two employed groups had a significantly lower rates of depression compared with the non-employed groups (Figure 3).

TABLE 2: Average Composite and Sub-Index Well-Being Scores

	Caregiver		Non-Caregiver		National
	Employed	Non-Employed	Employed	Non-Employed	
Composite Score	64.39	57.15	68.00	62.14	65.74
Life Evaluation Index	39.50	25.26	47.29	32.77	40.80
Emotional Health Index	77.35	67.24	81.00	72.62	79.07
Physical Health Index	76.74	61.16	82.26	67.92	76.90
Healthy Behavior Index	62.43	60.38	61.34	60.77	63.66
Work Environment Index	49.47	n/a	51.19	n/a	51.41
Basic Access Index	80.83	71.71	84.95	76.62	82.58

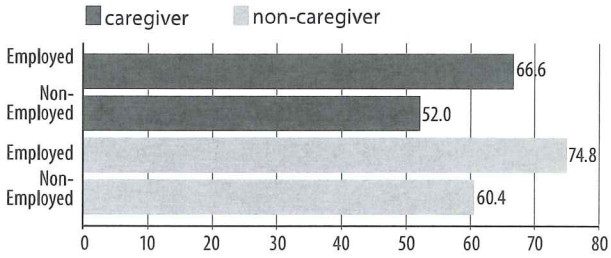
FIGURE 3: Percent Diagnosed by a Physician with Depression



Standard of Living

Examination of the percentage of individuals satisfied with their standard of living found significant differences among the groups ($p < .0001$) with a medium effect size, $V = .23$. The employed non-caregiver group had a significantly higher percentage of reported satisfaction compared with the other groups. The non-employed caregiver group had the lowest standard of living satisfaction rating, which proved significantly lower than the other groups (Figure 4).

FIGURE 4: Percent Satisfied with Their Standard of Living



DISCUSSION

The results of our analyses revealed a definitive pattern of well-being among the four study groups categorized by employment and caregiver status. For all measures but one, the employed non-caregiver group showed the most favorable score. Conversely, the non-employed caregivers consistently had the lowest well-being of the four groups. Employed caregivers typically had higher measures of well-being than the non-employed caregivers.

The one exception we found to the general pattern in the findings was for the Healthy Behavior Index. In this domain, we found that the employed caregiver group had a higher average score when compared to the employed non-caregiver group. Specifically, employed caregivers were more likely to be non-smokers and to regularly eat fruits and vegetables and exercise. The caregiving role may contribute to this effect by providing a more concrete perspective on the consequences of poor health and the value of preventive care. Another possible explanation is a "spillover effect" of caring for the health of another person, thereby creating a change in the caregiver's own personal health habits and mindfulness. For example, it is often easier to cook one healthy meal and follow the diet prescribed for the caregiving recipient rather than to cook two separate meals. A significant difference did not emerge between the two non-employed groups. Previous research has shown that caregiving is associated with certain healthy behaviors, but not others and that level of caregiving effort may influence the likelihood of engaging in healthy behaviors.[15 18] Further research will be necessary to elucidate the interplay of factors among the groups that impact healthy behaviors.

We found that employment was associated with greater well-being among both caregivers and non-caregivers and appeared to have a greater overall impact on well-being measures than did the caregiving role. This association could result from general differences in the characteristics of the groups. For example, employed respondents in this study were younger, on average, than non-employed respondents. However, employment can benefit the caregiver in multiple ways. First, time spent at work serves as a respite from the responsibilities of caregiving. A study of female employed caregivers found that greater time investment in work buffered the women from the negative effects of caregiving stress.[16] Second, working adds to the financial and social resources available to the caregiver – resources that are generally in greater supply for individuals who invest more time in their job.[16] Consistent with this finding, our results showed higher basic access scores among employed individuals, indicating that they were more likely to have access to fresh fruits and vegetables, healthcare, medicines, and to be satisfied with the city where they live.

Although employment can be beneficial to caregivers, the reverse is generally not true. We show here that caregiving was associated with additional stress, which is consistent with prior findings that work performance and employee retention are negatively affected when workers take on the role of caregiver.[7, 9, 17, 18] However, employers have the opportunity to mitigate these effects through workplace policies and programs that provide options for adapting work routines to complement caregiving responsibilities.[19] Caregivers in jobs that provide access to flexible hours, unpaid family leave, and paid sick or vacation days are more likely to remain employed and maintain work hours over a two-year period.[8] Additionally, workplace wellness programs can provide an outlet and resource to help employees maintain their well-being during stressful or difficult times, which proved more common among caregivers. According to recent estimates, 88% of firms with 200 or more employees have one or more wellness program offering;[20] these programs may contribute to the positive association between employment and well-being.

While employment and caregiving can both prove stressful, they can also prove rewarding. Previous research indicates that satisfaction with caregiving and satisfaction with work were directly associated with better well-being, beyond the effects of stress in both roles.[16] However, while we found

that among workers, caregivers tended to have healthier behaviors, this difference did not prove sufficient to impact the overall physical health of the caregiving employees. This was demonstrated in the higher physical well-being scores for the employed non-caregivers compared to employed caregivers. It is possible that the health benefits of behavioral changes made during a period of caregiving will accrue to better physical health over time, subsequent to the caregiving role. Future research should address the long-term impact of caregiving on physical health.

Based on our findings, clinical depression may be a factor that contributes to lower well-being among non-employed individuals. We found that lack of employment was more strongly associated with a diagnosis of depression than caregiving status. However, non-employed caregivers, once again, had the lowest well-being ratings of the four study groups. While this result may lead one to infer that lack of employment has a greater impact on depression than caregiving, caution should be exercised in making this assumption. It is also possible that individuals with depression are less likely to find and keep a job, thus contributing to their non-employment status.[21] What is apparent from this analysis is that individuals who are caregivers and non-employed may need additional help or resources in order to continue providing adequate care for their dependents.

Finally, while this study examined the facets of well-being associated with employment and caregiving, we did not look at specific characteristics of the caregiving population that may also impact well-being. Some of these factors include the relationship of the caregiver to the recipient, the number of hours spent caregiving, whether the recipient lives with the caregiver, and whether or not caregiving responsibilities are shared with others. Incorporating these additional considerations into the analysis could enhance understanding of caregivers and how these responsibilities impact the different aspects of well-being. In addition, it may be useful in future research to examine both the well-being of the recipient as well as the caregiver to elucidate how these roles interact and any support provisions that could improve quality of life for individuals in either position.

In conclusion, caregiving is associated with negative emotional and physical consequences, including a much higher rate of depression. Our findings also suggest that within the working population, caregivers have a less positive work experience, overall, compared to non-caregivers. However, it is interesting to note that while caregiving negatively impacts the caregiver's work experience (compared to other workers who are non-caregivers), having paid work appears to positively impact the caregiver in other areas of well-being (compared to other caregivers who are not working). Thus, well-being appears to be more closely related to employment status than to caregiving status and being non-employed may have a greater negative impact on overall well-being than playing the role of caregiver.

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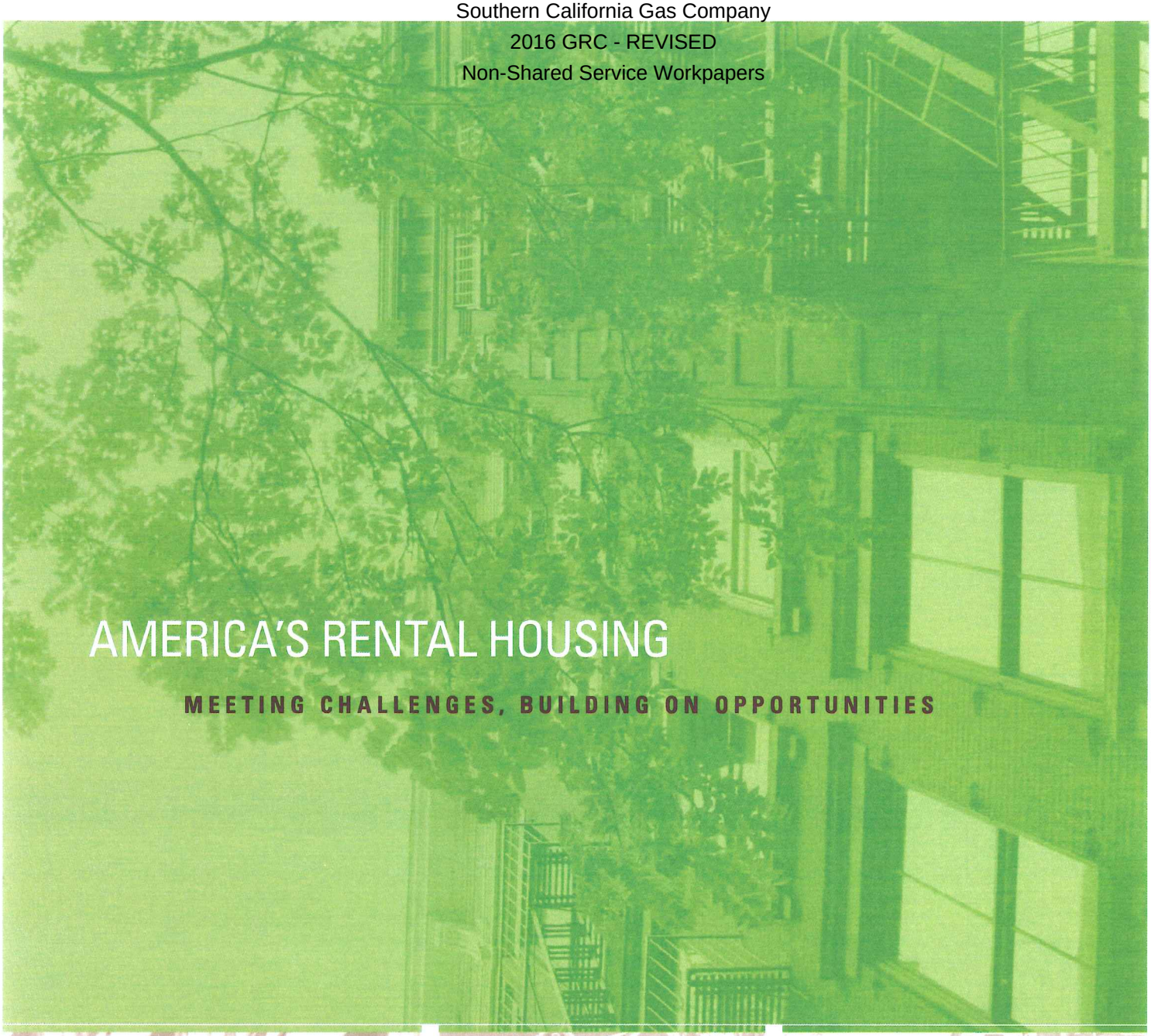
Supplemental Workpapers for Workpaper 2IN004

Footnote No. 118

Joint Center for Housing Studies of Harvard University

America's Rental Housing – Meeting Challenges, Building on Opportunities

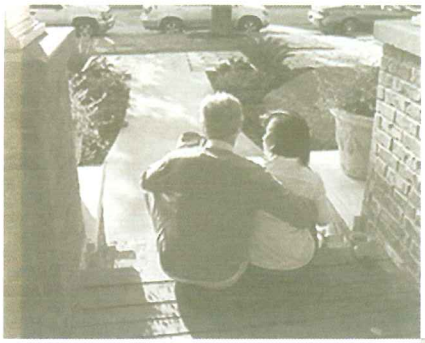
The entire document is available upon request.



AMERICA'S RENTAL HOUSING

MEETING CHALLENGES, BUILDING ON OPPORTUNITIES

Joint Center for Housing Studies of Harvard University



RENTER DEMOGRAPHICS

Rental housing serves a large and diverse population of nearly 39 million households. Although renting is most common among young adults, nearly everyone rents at some point in their lives—whether by choice or by necessity. But rental housing is particularly important for low-income and minority households, about half of whom are renters. As a result, supplying affordable units in a variety of structure types and neighborhoods is a critical housing policy priority.

RENTING OVER THE LIFECYCLE

Renting plays several roles over the lifecycle of the average householder. Most commonly, rental housing provides an opportunity to live independently. Among householders under age 25, some 78 percent are renters. Renting is a good option for many young households because the low transaction costs of moving suit their stage in life marked by higher mobility, more flexible job tenure, and changing relationships. Renting enables young householders to pursue job opportunities in new locations more easily and to experience different living arrangements. Even if young adults prefer to own, they usually lack the wealth to do so.

As householders age and become more settled, their homeownership rates rise steadily **(Table A-3).** At 25–30 years old, about one-third own their homes while the majority still rent. By the age of 40, however, two-thirds of householders own homes. Nevertheless, about a fifth of households over age 55 remain renters. Those choosing to rent often prefer to have limited responsibility for home maintenance and to avoid the financial risks associated with unexpected repairs and potential declines in house values.

Household type and life stage also influence tenure decisions. With a homeownership rate of more than 80 percent, married couples clearly prefer to buy while just over half of all unmarried householders rent. According to the American Housing Survey, only 25 percent of all married homeowners who moved between 2007 and 2009 switched to renting, but over half of all other homeowners who moved during that period did so. Rentership rates rise modestly among elderly households over age 75, especially among those that are single.

Demographic characteristics also affect the types of homes that renters choose **(Figure 12**). For example, singles and householders over age 65 are most likely to rent in larger multifamily buildings in center cities or suburbs. Renters who are married with children are most likely to live in single-family detached homes. At the same time, though,

for 27 percent of the increase. As a result, the minority share of renters rose to about 45 percent in 2010—more than twice the minority share of owners. In large measure, minority gains reflect immigration. Foreign-born householders add to renter diversity and make up a significant portion of the market. Almost one in five renter households is headed by an immigrant, twice the share among homeowners. About half of all immigrants are renters, including 74 percent of those under age 35.

But the Great Recession sharply reduced the inflow of immigrants as well as the outflow of native-born renters into homeownership **(Figure 13)**. After averaging about 200,000 per year from 2000 to 2005, immigrant renter growth dropped by more than half from 2005 to 2010. A surge in the number of native-born renters has, however, more than offset this decline. Indeed, native-born households are now driving growth in the renter population at a pace unmatched since the 1980s. In a sharp turnaround from the first half of the decade, whites accounted for a majority of the increase in native-born renters in the second half of the 2000s.

THE INCOME AND WEALTH GAP

In 2010, more than half of all households in the bottom income quartile were renters, while fully 87 percent of households in the top income quartile were homeowners. In part, the lower incomes of renters reflect the large share of households with only one earner. Renters as a group are therefore much more likely than owners to have low incomes, regardless of age. Across all age groups, the median income of renters is about half that of same-aged owners.

Renter incomes vary by race and ethnicity. Throughout the past decade, the median household incomes of Hispanic renters were approximately 15 percent lower, and those of black renters were 30 percent lower, than those of whites. Although the lower average age of minority renters explains some of this difference, the disparity holds even among households of comparable ages. Among 35 to 44 year-olds, for example, the median incomes of Hispanic and black renters were 24 percent and 28 percent below that of white renters.

Moreover, renters are becoming increasingly concentrated at the lowest income levels. From 1990 to 2010, households with incomes below the national median accounted for 84 percent of the growth in renters, while higher-income households drove virtually all of the growth in owners. Fully 60 percent of the increase in renters came from households in the bottom income quartile alone. By 2010, approximately 70 percent of renter households had incomes below the national median and more than 40 percent had incomes in the bottom quartile **(Figure 14)**.

Recessions have been a major factor in holding back renter income growth, suggesting that renters are more susceptible to layoffs and unemployment in weak labor markets and have a more difficult time recovering afterward. The downturns in the early 1990s and 2000s hit renters especially hard, pushing their real median household incomes down three times more than those of homeowners. These declines were not offset during subsequent expansions, adding to the owner–renter income gap.

In addition, renters have only a fraction of the net wealth of owners. Near the peak of the housing bubble in 2007, the median net wealth of homeowners was $234,600—about 46 times the $5,100 median for renters. Even if homeowner wealth fell back to 1995 levels, it would still be 27.5 times the median for renters. This underscores the fact that, in addition to having the potential to accumulate wealth through home price appreciation, paying down principal, and controlling a portion of their housing costs, homeowners start out with higher incomes and wealth than renters.

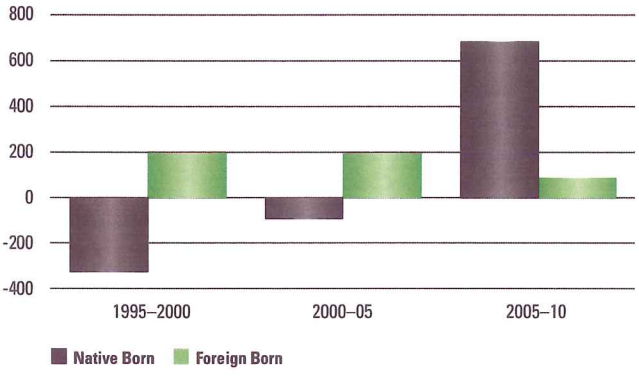
RETURN TO RENTER HOUSEHOLD GROWTH

After a long period of stagnation, the number of renter households is once again on the rise **(Figure 15)**. The majority

FIGURE 13

Growth in Native-Born Renters Has Surged While Growth in Foreign-Born Renters Has Slowed

Average Annual Renter Household Growth (Thousands)



Source: JCHS tabulations of US Census Bureau, Current Population Surveys.

of this growth is not due to higher household formation rates among younger renters but rather to lower homeownership rates across a broad spectrum of the population. Declines in homeownership rates are evident among all demographic groups, but are most pronounced for households with children, blacks, and those aged 25 to 44 (**Figure 16**). These shifts have erased much of the homeownership gains made since 1995 and, in many cases, wiped out increases in the 2000s.

Had homeownership rates by age remained at 2005 levels, net renter household growth from 2005 to 2010 would have been just under 370,000 (resulting from the net formation of 5.1 million new renter households under age 30 and the net loss of 4.8 million older renters primarily to homeownership). Instead, renter household growth surged by nearly 4.0 million over this period. Indeed, the net dissolution of renter households over age 30 was just 1.8 million—fully 3.0 million less than expected assuming constant homeownership rates. The net formation of renter households under age 30 was also over 626,000 more than expected.

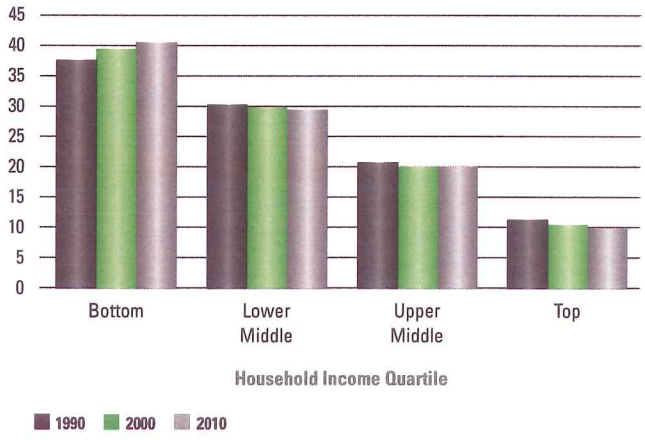
Over the next 10 years, demographic trends favor continued growth in the number of renter households. Conservatively assuming that homeownership rates by age, race, and household type stabilize at 2010 levels and that immigration is only half the current Census Bureau baseline projection, population growth alone should lift the number of renter households by more than 3.6 million in 2010–20. This projection reflects the net formation of 11.3 million new households among the huge echo-boom generation (those under age 35 in 2020) and the loss of 7.7 million households among renters in all older age groups. While younger renters live in all types of housing and geographic areas, they tend to favor multifamily housing in center city locations.

Meanwhile, the sheer size of the baby-boom generation relative to its predecessor will push up the number of renters over age 65 by nearly 2 million, generating increased demand for assisted units set aside for elderly households as well as for accessible features and other adaptive changes to con-

FIGURE 14

Renter Households Are Increasingly Concentrated in the Bottom Quarter of the Income Scale

Share of Renter Households, 1990–2010 (Percent)

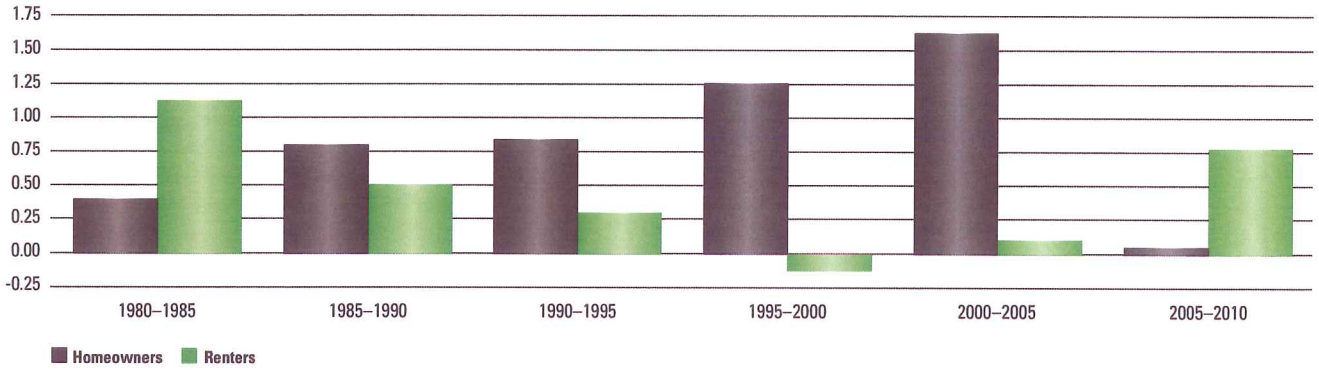


Note: Income quartiles are equal fourths of all households (both owners and renters) sorted by pre-tax income.
Source: JCHS tabulations of US Census Bureau, Current Population Surveys.

FIGURE 15

After Stagnating for More than a Decade, Growth in Renter Households Revived in 2005

Average Annual Household Growth (Millions)



Source: JCHS tabulations of US Census Bureau, Current Population Surveys.

Supplemental Workpapers for Workpaper 2IN004

Footnote No. 119

California Department of Consumer Affairs

Dealing with Problems

Dealing With Problems

Most landlord-tenant relationships go smoothly. However, problems sometimes do arise. For example, what if the rental unit's furnace goes out in the middle of the winter? What happens if the landlord sells the building or decides to convert it into condominiums? This section discusses these and other possible issues and problems in the landlord-tenant relationship.

REPAIRS AND HABITABILITY

A **rental unit** must be fit to live in; that is, it must be **habitable**. In legal terms, "habitable" means that the rental unit is fit for occupation by human beings and that it substantially complies with state and local building and health codes that materially affect tenants' health and safety.[129]

California law makes **landlords** and **tenants** each responsible for certain kinds of repairs, although landlords ultimately are legally responsible for assuring that their rental units are habitable.

Landlord's responsibility for repairs

Before renting a rental unit to a tenant, a landlord must make the unit fit to live in, or habitable. Additionally, while the unit is being rented, the landlord must repair problems that make the rental unit unfit to live in, or **uninhabitable**.

The landlord has this duty to repair because of a California Supreme Court case, called Green v. Superior Court,[130] which held that all residential **leases** and **rental agreements** contain an **implied warranty of habitability**. Under the "implied warranty of habitability," the landlord is legally responsible for repairing conditions that seriously affect the rental unit's habitability.[131] That is, the landlord must repair substantial defects in the rental unit and substantial failures to comply with state and local building and health codes.[132] However, the landlord is not responsible under the implied warranty of habitability for repairing damages that were caused by the tenant or the tenant's family, guests, or pets.[133]

Generally, the landlord also must do maintenance work which is necessary to keep the rental unit liveable.[134] Whether the landlord or the tenant is responsible for making less serious repairs is usually determined by the **rental agreement**.

The law is very specific as to what kinds of conditions make a rental uninhabitable. These are discussed below.

Tenant's responsibility for repairs

Tenants are required by law to take reasonable care of their rental units, as well as common areas such as hallways and outside areas. Tenants must act to keep those areas clean and undamaged. Tenants also are responsible for repair of all damage that results from their neglect or abuse, and for repair of damage caused by anyone for whom they are responsible, such as family, guests, or pets.[135] Tenants' responsibilities for care and repair of the rental unit are discussed in detail below.

Conditions that make a rental unit legally uninhabitable

There are many kinds of defects that could make a rental unit unlivable. The implied warranty of habitability requires landlords to maintain their rental units in a condition fit for the "occupation of human beings."[136] In addition, the rental unit must "substantially comply" with building and housing code standards that materially affect tenants' health and safety.[137]

A rental unit may be considered uninhabitable (unlivable) if it contains a lead hazard that endangers the occupants or the public, or is a substandard building because, for example, a structural hazard, inadequate sanitation, or a nuisance endangers the health, life, safety, property, or welfare of the occupants or the public.[138]

A dwelling also may be considered uninhabitable (unlivable) if it substantially lacks any of the following:[139]

- Effective waterproofing and weather protection of roof and exterior walls, including unbroken windows and doors.
- Plumbing facilities in good working order, including hot and cold running water, connected to a sewage disposal system.
- Gas facilities in good working order.
- Heating facilities in good working order.
- An electric system, including lighting, wiring, and equipment, in good working order.
- Clean and sanitary buildings, grounds, and appurtenances (for example, a garden or a detached garage), free from debris, filth, rubbish, garbage, rodents, and vermin.
- Adequate trash receptacles in good repair.
- Floors, stairways, and railings in good repair.

In addition to these requirements, each rental unit must have all of the following:

- A working toilet, wash basin, and bathtub or shower. The toilet and bathtub or shower must be in a room which is ventilated and allows privacy.
- A kitchen with a sink that cannot be made of an absorbent material such as wood.
- Natural lighting in every room through windows or skylights. Windows in each room must be able to open at least halfway for ventilation, unless a fan provides mechanical ventilation.
- Safe fire or emergency exits leading to a street or hallway. Stairs, hallways, and exits must be kept litter-free. Storage areas, garages, and basements must be kept free of combustible materials.[140]
- Operable dead bolt locks on the main entry doors of rental units, and operable locking or security devices on windows.[141]

Working smoke detectors in all units of multi-unit buildings, such as duplexes and apartment complexes. Apartment complexes also must have smoke detectors in common stairwells.[142]

A locking mail box for each unit. The mail box must be consistent with the United States Postal Service standards for apartment housing mail boxes.[143]

Ground fault circuit interrupters for swimming pools and antisuction protections for wading pools in apartment complexes and other residential settings (but not single family residences).[144]

The implied warranty of habitability is *not* violated merely because the rental unit is not in perfect, aesthetically pleasing condition. Nor is the implied warranty of habitability violated if there are minor housing code violations, which, standing alone, do not affect habitability.[145]

While it is the landlord's responsibility to install and maintain the inside wiring for one telephone jack, it is unclear whether the landlord's failure to do so is a breach of the implied warranty of habitability.[146]

An authoritative reference book suggests two additional ways in which the implied warranty of habitability may be violated. The first is the presence of mold conditions in the rental unit that affect the livability of the unit or the health and safety of tenants. The second follows from a new law that imposes obligations on a property owner who is notified by a local health officer that the property is contaminated by methamphetamine. (See When You Have Decided to Rent, Methamphetamine Contamination.) This reference book suggests that a tenant who is damaged by this kind of documented contamination may be able to claim a breach of the implied warranty of habitability.[147]

Limitations on landlord's duty to keep the rental unit habitable

Even if a rental unit is unlivable because of one of the conditions listed above, a landlord may not be legally required to repair the condition if the tenant has not fulfilled the tenant's own responsibilities.

In addition to generally requiring a tenant to take reasonable care of the rental unit and common areas (see above), the law lists specific things that a tenant must do to keep the rental unit liveable.

Tenants must do all of the following

Keep the premises "as clean and sanitary as the condition of the premises permits."

Use and operate gas, electrical, and plumbing fixtures properly. (Examples of improper use include overloading electrical outlets; flushing large, foreign objects down the toilet; and allowing any gas, electrical, or plumbing fixture to become filthy.)

Dispose of trash and garbage in a clean and sanitary manner.

Not destroy, damage, or deface the premises, or allow anyone else to do so.

Not remove any part of the structure, dwelling unit, facilities, equipment, or appurtenances, or allow anyone else to do so.

Use the premises as a place to live, and use the rooms for their intended purposes. For example, the bedroom must be used as a bedroom, and not as a kitchen.[148]

Notify the landlord when dead bolt locks and window locks or security devices don't operate properly.[149]

However, a landlord may agree in writing to clean the rental unit and dispose of the trash.[150]

If a tenant violates these requirements in some minor way, the landlord is still responsible for providing a habitable dwelling, and may be prosecuted for violating housing code standards. If the tenant fails to do one of these required things, and the tenant's failure has either substantially caused an unlivable condition to occur or has substantially interfered with the landlord's ability to repair the condition, the landlord does not have to repair the condition.[151] However, a tenant cannot withhold rent or has no action against the landlord for violating the implied warranty of habitability if the tenant has failed to meet these requirements.[152]

Responsibility for other kinds of repairs

As for less serious repairs, the rental agreement or **lease may** require either the tenant or the landlord to fix a particular item. Items covered by such an agreement might include refrigerators, washing machines, parking places, or swimming pools. These items are usually considered "amenities," and their absence does not make a dwelling unit unfit for living.

These agreements to repair are usually enforceable in accordance with the intent of the parties to the rental agreement or lease.[153]

Tenant's agreement to make repairs

The landlord and the tenant may agree in the rental agreement or lease that the tenant will perform all repairs and maintenance in exchange for lower rent.[154] Such an agreement must be made in good faith: there must be a real reduction in the rent, and the tenant must intend and be able to make all the necessary repairs. When negotiating the agreement, the tenant should consider whether he or she wants to try to negotiate a cap on the amount that he or she can be required to spend making repairs. Regardless of any such agreement, the landlord is responsible for maintaining the property as required by state and local housing codes.[155]

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[129] *Green v. Superior Court (1974) 10 Cal.3d 616, 637-638 [111 Cal.Rptr. 704, 719]; Civil Code Sections 1941, 1941.1*

[130] *Green v. Superior Court (1974) 10 Cal.3d 616 [111 Cal.Rptr. 704].*

[131] *Green v. Superior Court(1974) 10 Cal.3d 616 [111 Cal.Rptr. 704]; Hinson v. Delis (1972) 26 Cal.App.3d 62 [102 Cal.Rptr. 661].*

[132] *Green v. Superior Court (1974) 10 Cal.3d 616, 637-638 [111 Cal.Rptr. 704, 718-719].*

[133] *Civil Code Sections 1929, 1941.2.*

[134] *Green v. Superior Court (1974) 10 Cal.3d 616 [111 Cal.Rptr. 704].*

[135] *Civil Code Sections 1929, 1941.2.*

[136] *Civil Code Section 1941.*

[137] *Green v. Superior Court (1974) 10 Cal.3d 616 [111 Cal.Rptr. 704].*

[138] *Code Section 1941.1 paragraph 1, Health and Safety Code Sections 17920.3, 17920.10.*

[139] *Civil Code Section 1941.1.*

[140] *Health and Safety Code Sections 17900-17995; California Landlord's Law Book: Rights and Responsibilities, page 186 (NOLO Press 2011).*

[141] *Civil Code Section 1941.3. See this section for additional details and exemptions. Remedies for violation of these requirements are listed at Civil Code Section 1941.3(c). See California Practice Guide, Landlord-Tenant, Paragraphs 3:21.5-3:21.10 (Rutter Group 2011).*

[142] *Health and Safety Code 13113.7.*

[143] *Health and Safety Code Section 17958.3; Civil Code Section 1941.1(i).*

[144] *Health and Safety Code Sections 116049.1, 116064.*

[145] *Green v. Superior Court (1974) 10 Cal.3d 616, 637-638 [111 Cal.Rptr. 704, 718-719]; Hinson v. Delis (1972) 26 Cal.App.3d 62, 70 [102 Cal.Rptr. 661, 666].*

[146] *Civil Code Section 1941.4; Public Utilities Code Section 788. See California Practice Guide, Landlord-Tenant, Paragraph 3:21.10 (Rutter Group 2011).*

[147] *Moskovitz et al., California Landlord-Tenant Practice, Section 3.11B (Cal. Cont. Ed. Bar 2009); see Health and Safety Code Sections 25400.10-25400.46, effective January 1, 2006.*

[148] *Civil Code Section 1941.2(a)(5).*

[149] *Civil Code Section 1941.3(b).*
[150] *Civil Code Section 1941.2(b).*
[151] *Civil Code Section 1941.2(a).*
[152] *Civil Code Section 1929, 1942(c); see Brown, Warner and Portman, The California Landlord's Law Book, Vol. I: Rights & Responsibilities, pages 188-189 (NOLO Press 2011).*
[153] *Portman and Brown, California Tenants' Rights, page 30 (NOLO Press 2010).*
[154] *Civil Code Section 1942.1.*
[155] *Portman and Brown, California Tenants' Rights, page 20 (NOLO Press 2010).*

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2012 Edition

Supplemental Workpapers for Workpaper 2IN004

Footnote No. 122

NMR Group, Inc.

California Multifamily Residential New Construction Market Effects Study: Phase I Report Draft

The entire document is available upon request.

California Multifamily Residential New Construction
Market Effects Study: Phase I Report

DRAFT

5/5/2014

Submitted to:

California Public Utilities Commission

Submitted by:

NMR Group, Inc.

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more responsive to the housing recovery, accounting for the bulk of the increase in MFNC activity from 2010 through 2012, suggesting that the low-income market is less affected by housing market cycles.

- **Potential MFNC market trends:** New construction permit data suggests a potential trend toward higher levels of MFNC in the residential new construction (RNC) market. Between 2010 and 2012, multifamily units accounted for 52% of units compared to an average of 28% of permitted units from 1993 to 2008.
    - MFNC is likely to continue to grow in 2014, to over 69,000 permitted units and over 50,000 unit starts.
    - MFNC may be trending toward high-rise projects. High-rise units increased from 37% of units in 2010 to 55% of units in 2012.
- **Energy efficiency decision makers and factors:** Developers are the key decision makers while architects, Title 24 consultants, HERS raters and others have limited influence on decisions pertaining to the energy efficiency of a MFNC project.
    - Development and efficiency decisions are driven primarily by economic and financial considerations.
    - Energy efficiency does not appear to be a consumer priority.
    - Affordable housing developers and some higher-end developers who market for sustainably designed features are in the forefront of designing (and building) projects incorporating advanced energy-efficiency techniques

Several recommendations for future research and IOU program design emerge from the findings of this study.

- Begin tracking the short-term and medium term outcomes that rely on market-actor self-reports on an ongoing basis. We recommend conducting interviews or surveys during the construction process or as soon after completion as possible in order to assess the influence of the program and other factors on key decision-making in regard to the energy efficiency of the project.
- Conduct follow-up on-site visits and an assessment of building conditions in a few years, perhaps in 2017, on projects started in 2015 and 2016. This would capture MFNC projects designed and built several years after the 2010-2012 program cycle, which should provide enough time to begin to detect early market effects, while also allowing enough time to provide feedback to program staff in order to modify the program if the market is not on target to reach ZNE by 2020.
- The IOUs' programs should attempt to target the largest builders since the market is highly concentrated among a small number of builders, particularly for market-rate projects. By working with the largest builders, the program may realize market effects by influencing the efficiency practices in non-program projects built by the same builders as well as MFNC projects of other builders who may look to emulate the practices of the largest builders.

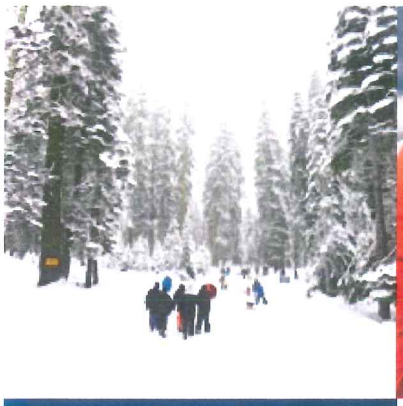
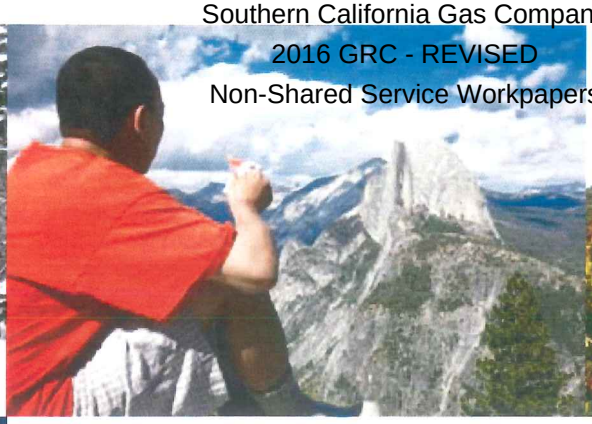
Supplemental Workpapers for Workpaper 2IN004

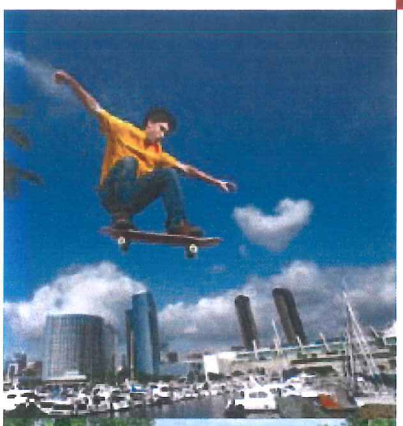
Footnote No. 124

California Air Resources Board for the State of California

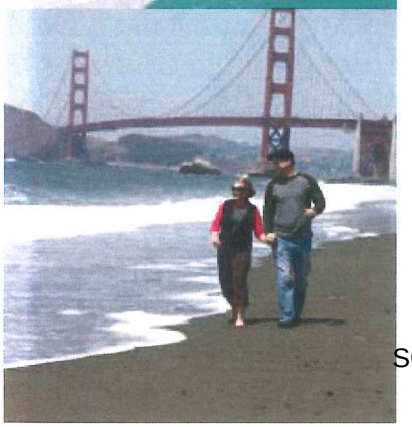
Climate Change Scoping Plan a Framework for Change December 2008

The entire document is available upon request.







Climate Change Scoping Plan

a framework for change

DECEMBER 2008

Pursuant to AB 32
The California Global Warming Solutions Act of 2006

Prepared by
the California Air Resources Board
for the State of California

Arnold Schwarzenegger
Governor

Linda S. Adams
Secretary, California Environmental Protection Agency

Mary D. Nichols
Chairman, Air Resources Board

James N. Goldstene
Executive Officer, Air Resources Board

savings over the past three decades. Tables 7 and 8 summarize the reduction of greenhouse gas emissions.

Efficiency

Achieving the energy efficiency target will require redoubled efforts to target industrial, agricultural, commercial, and residential end-use sectors, comprised of both innovative new initiatives that have been embraced by CEC's energy policy reports and CPUC's long-term strategic plan, and improvements to California's traditional approaches of improved building standards and utility programs.

High-efficiency distributed generation applications like fuel cell technologies can also play an important role in helping the State meet its requirements for reduction of greenhouse gas emissions. Key energy efficiency strategies, grouped by type, include:

Cross-cutting Strategy for Buildings
- "Zero Net Energy" buildings[34]

Codes and Standards Strategies
- More stringent building codes and appliance efficiency standards
- Broader standards for new types of appliances and for water efficiency
- Improved compliance and enforcement of existing standards
- Voluntary efficiency and green building targets beyond mandatory codes

Strategies for Existing Buildings
- Voluntary and mandatory whole-building retrofits for existing buildings
- Innovative financing to overcome first-cost and split incentives for energy efficiency, on-site, renewables, and high efficiency distributed generation

Existing and Improved Utility Programs
- More aggressive utility programs to achieve long-term savings

Other Needed Strategies
- Water system and water use efficiency and conservation measures
- Local government programs that lead by example and tap into local authority over planning, development, and code compliance
- Additional industrial and agricultural efficiency initiatives
- Providing real time energy information technologies to help consumers conserve and optimize energy performance

With the support of key State agencies, utilities, local governments and others, the CPUC has recently adopted the *California Long Term Energy Efficiency Strategic*

[34] Zero net energy refers to building energy use over the course of a typical year. When the building is producing more electricity than it needs, it exports its surplus to the grid. When the building requires more electricity than is being produced on-site, it draws from the grid. Generally, when constructing a ZNE building, energy efficiency measures can result in up to 70% savings relative to existing building practices, which then allows for renewables to meet the remaining load.

Plan.[35] Released September 2008, this Plan sets forth a set of strategies toward maximizing the achievement of cost-effective energy efficiency in California's Electricity and Natural Gas sectors between 2009 and 2020, and beyond. Its recommendations are the result of a year-long collaboration by energy experts, utilities, businesses, consumer groups, and governmental organizations in California, throughout the west, nationally and internationally.

For many of the above goals and others, the Strategic Plan discusses practical implementation strategies, detailing necessary partnerships among the state, its utilities, the private sector, and other market players and timelines for near-term, mid-term and long-term success. While the Strategic Plan is the most current and innovative summary of energy efficiency strategies needed to meet State goals, additional planning and new strategies will likely be needed, both to achieve the 2020 emissions reduction goals and to set the State on a trajectory toward 2050.

Other innovative approaches could also be used to motivate private investment in efficiency improvements. One example that will be evaluated during the development of the cap-and-trade program is the creation of a mechanism to make allowances available within the program to provide incentives for local governments, third party providers, or others to pursue projects to reduce greenhouse gas emissions, including the bundling of energy efficiency improvements for small businesses or in targeted communities.

Solar Water Heating

Solar water heating systems offer a potential for natural gas savings in California. A solar water heating system offsets the use of natural gas by using the sun to heat water, typically reducing the need for conventional water heating by about two-thirds. Successful implementation of the zero net energy target for new buildings will require significant growth in California's solar water heating system manufacturing and installation industry. The State has initiated a program to move toward a self sustaining solar water heater industry. The Solar Hot Water and Efficiency Act of 2007 (SHWEA) authorized a ten year, $250-million incentive program for solar water heaters with a goal of promoting the installation of 200,000 systems in California by 2017.[36]

Combined Heat and Power

Combined heat and power (CHP), also referred to as cogeneration, produces electricity and useful thermal energy in an integrated system. The widespread development of efficient CHP systems would help displace the need to develop new, or expand existing, power plants. This measure sets a target of an additional

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[35] California Public Utilities Commission. *California Long Term Energy Efficiency Strategic Plan.* September 2008. http://www.californiaenergyefficiency.com/docs/EEStrategicPlan.pdf (accessed October 12, 2008).

[36] Established under Assembly Bill 1470 (Huffman, Chapter 536, Statues of 2007).

Supplemental Workpapers for Workpaper 2IN004

Footnote No. 125

Jerry Brown

Clean Energy Jobs Plan

The entire document is available upon request.

JERRY BROWN

Clean Energy Jobs Plan

Introduction

When I was governor, California was the world leader in renewable energy and it led the nation in efficiency standards. Our programs saved California consumers billions and created nearly 1.5 million jobs.

Until the early 1990's, nearly all renewable energy development in the US occurred in California, which at one time had more than 90% of the world's wind energy capacity.

That has changed-- China is now the world's top renewable energy producer, and Texas and Iowa generate more wind power than California.

As we face the devastation to our job market caused by the mortgage meltdown and the Wall Street debacle, we need to find a way to get California working again. Investing in clean energy and increasing efficiency are central elements of rebuilding our economy. It will create hundreds of thousands of jobs, build the businesses of the 21st century, increase energy independence, and protect public health.

Renewable Energy:

Investments in clean energy produce two to three times as many jobs per dollar as gas, oil or coal. And dollars invested in clean energy tend to stay in California, instead of other states or countries. Renewable energy also reduces greenhouse gas emissions and other harmful air pollutants.

Clean energy jobs and businesses have grown much faster than the economy as a whole in the past fifteen years, and have continued to grow even during the economic downturn.

Investment in clean technology is also growing. Clean tech investment in California reached $3.3 billion in 2008 alone and it is on track to exceed that in 2010. California attracts 60% of the clean-tech venture capital in the entire U.S, but with the right policies and incentives, California could attract even more investment and create far more jobs in the coming years. Over the next decade, the global clean energy market is expected to nearly triple to nearly $2 trillion annually in 2020.

Governor|2010
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ID #1321867 www.JerryBrown.org

JERRY BROWN
Governor | 2010

6. **Adopt Stronger Appliance Efficiency Standards**

- The CEC should adopt stronger appliance standards for lighting, consumer electronics and other products. Federal law should be changed to make it easier for California to adopt standards more stringent than federal standards, as we have authority to do for automobile emission standards. For example, a proposed CEC efficiency rule for clothes washers would save enough water for all of San Diego for a year.

- We should also increase public education and enforcement efforts so that the gains promised by our efficiency standards are in fact realized.

7. **Develop More Combined Heat & Power (CHP) Projects**

- Combined heat and power projects (also known as cogeneration) use the excess heat or electricity generated by power plants or industrial facilities. They are much more efficient than traditional power plants and many industrial plants. California currently produces 9,249 MW of combined heat and power. With the right incentives, we can increase this by 6,500 MW over the next 20 years.

8. **Appoint a Renewable Energy Jobs Czar**

- I will designate one person, directly accountable to the governor, who will be responsible for ensuring that all energy jobs goals and deadlines are met.

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Supplemental Workpapers for Workpaper 2IN004

Footnote No. 126

The While House

Executive Order – Accelerating Investment in Industrial Energy Efficiency

The White House

Office of the Press Secretary

For Immediate Release August 30, 2012

Executive Order -- Accelerating Investment in Industrial Energy Efficiency

EXECUTIVE ORDER

ACCELERATING INVESTMENT IN INDUSTRIAL ENERGY EFFICIENCY

By the authority vested in me as President by the Constitution and the laws of the United States of America, and in order to promote American manufacturing by helping to facilitate investments in energy efficiency at industrial facilities, it is hereby ordered as follows:

Section 1. Policy. The industrial sector accounts for over 30 percent of all energy consumed in the United States, and, for many manufacturers, energy costs affect overall competitiveness. While our manufacturing facilities have made progress in becoming more energy efficient over the past several decades, there is an opportunity to accelerate and expand these efforts with investments to reduce energy use through more efficient manufacturing processes and facilities and the expanded use of combined heat and power (CHP). Instead of burning fuel in an on site boiler to produce thermal energy and also purchasing electricity from the grid, a manufacturing facility can use a CHP system to provide both types of energy in one energy efficient step. Accelerating these investments in our Nation's factories can improve the competitiveness of United States manufacturing, lower energy costs, free up future capital for businesses to invest, reduce air pollution, and create jobs.

Despite these benefits, independent studies have pointed to under-investment in industrial energy efficiency and CHP as a result of numerous barriers. The Federal Government has limited but important authorities to overcome these barriers, and our efforts to support investment in industrial energy efficiency and CHP should involve coordinated engagement with a broad set of stakeholders, including States, manufacturers, utilities, and others. By working with all stakeholders to address these barriers, we have an opportunity to save industrial users tens of billions of dollars in energy costs over the next decade.

There is no one size fits all solution for our manufacturers, so it is imperative that we support these investments through a variety of approaches, including encouraging private sector investment by setting goals and highlighting the benefits of investment, improving coordination at the Federal level, partnering with and supporting States, and identifying investment models beneficial to the multiple stakeholders involved.

To formalize and support the close interagency coordination that is required to accelerate greater investment in industrial energy efficiency and CHP, this order directs certain executive departments and agencies to convene national and regional stakeholders to identify, develop, and encourage the adoption of investment models and State best practice policies for industrial energy efficiency and CHP; provide technical assistance to States and manufacturers to encourage investment in industrial energy efficiency and CHP; provide public information on the benefits of investment in industrial energy efficiency and CHP; and use existing Federal authorities, programs, and policies to support investment in industrial energy efficiency and CHP.

Sec. 2. Encouraging Investment in Industrial Efficiency. The Departments of Energy, Commerce, and Agriculture, and the Environmental Protection Agency, in coordination with the National Economic Council, the Domestic Policy Council, the Council on Environmental Quality, and the Office of Science and Technology Policy, shall coordinate policies to encourage investment in industrial efficiency in order to reduce costs for industrial users, improve U.S. competitiveness, create jobs, and reduce harmful air pollution. In doing so, they shall engage States, industrial companies, utility companies, and other stakeholders to accelerate this investment. Specifically, these agencies shall, as appropriate and consistent with applicable law:

(a) coordinate and strongly encourage efforts to achieve a national goal of deploying 40 gigawatts of new, cost effective industrial CHP in the United States by the end of 2020;

(b) convene stakeholders, through a series of public workshops, to develop and encourage the use of best practice State policies and investment models that address the multiple barriers to investment in industrial energy efficiency and CHP;

(c) utilize their respective relevant authorities and resources to encourage investment in industrial energy efficiency and CHP, such as by:

(i) providing assistance to States on accounting for the potential emission reduction benefits of CHP and other energy efficiency policies when developing State Implementation Plans (SIPs) to achieve national ambient air quality standards;

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(ii) providing incentives for the deployment of CHP and other types of clean energy, such as set asides under emissions allowance trading program state implementation plans, grants, and loans;

(iii) employing output based approaches as compliance options in power and industrial sector regulations, as appropriate, to recognize the emissions benefits of highly efficient energy generation technologies like CHP; and

(iv) seeking to expand participation in and create additional tools to support the Better Buildings, Better Plants program at the Department of Energy, which is working with companies to help them achieve a goal of reducing energy intensity by 25 percent over 10 years, as well as utilizing existing partnership programs to support energy efficiency and CHP;

(d) support and encourage efforts to accelerate investment in industrial energy efficiency and CHP by:

(i) providing general guidance, technical analysis and information, and financial analysis on the value of investment in industrial energy efficiency and CHP to States, utilities, and owners and operators of industrial facilities;

(ii) improving the usefulness of Federal data collection and analysis; and

(iii) assisting States in developing and implementing State specific best practice policies that can accelerate investment in industrial energy efficiency and CHP.

In implementing this section, these agencies should consult with the Federal Energy Regulatory Commission, as appropriate.

Sec. 3. General Provisions. (a) Nothing in this order shall be construed to impair or otherwise affect:

(i) the authority granted by law to an executive department, agency, or the head thereof; or

(ii) the functions of the Director of the Office of Management and Budget relating to budgetary, administrative, or legislative proposals.

(b) This order shall be implemented consistent with applicable law and subject to the availability of appropriations.

(c) This order is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

BARACK OBAMA

THE WHITE HOUSE,
August 30, 2012.

Supplemental Workpapers for Workpaper 2IN004

Footnote No. 127, 128, 129, 131 & 133

ICF International, Inc.

Combined Heat and Power Policy Analysis and 2011 – 2030 Market Assessment

The entire document is available upon request.

CONSULTANT REPORT

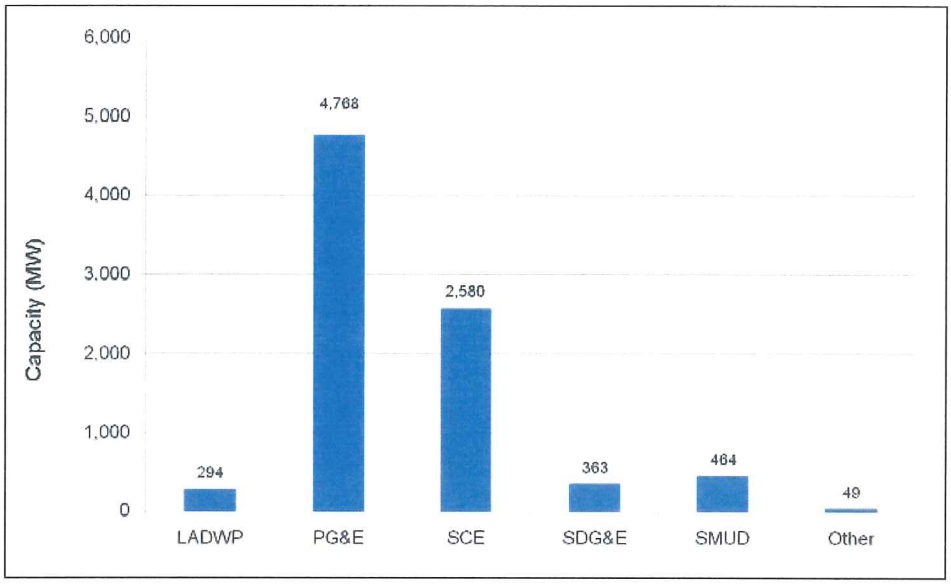
COMBINED HEAT AND POWER: POLICY ANALYSIS AND 2011 – 2030 MARKET ASSESSMENT

Prepared for: California Energy Commission
Prepared by: ICF International, Inc.

JUNE 2012
CEC-200-2012-002-REV

concentration of large oil fields and refineries in its territory. **Figure 5** shows the distribution of CHP by utility service area. This breakdown depicts the actual physical location of the CHP system and does not account for systems located in one utility territory that sell electricity to other utilities or parties outside the territory. One area of the state that is known to have this issue is Kern County, where a significant amount CHP capacity (more than 500 MW) is installed at enhanced oil recovery facilities that are geographically within PG&E's service territory but export electricity to SCE.

Figure 5: Installed CHP in California by Utility Service Area



Source: CHP Installation Database.

The existing CHP installations can also be characterized in terms of the size of the facility (**Figure 6**), the primary fuel used (**Figure 7**), and the type of prime mover (**Figure 8**).

Systems smaller than 5 MW represent only 6.2 percent of total existing CHP capacity in California, while systems larger than 100 MW represent almost 40 percent of the total existing capacity. However, as will be shown later, the market saturation of CHP in large facilities is much higher than for smaller sites. Much of the remaining technical market potential is composed of smaller systems. Recent growth trends in installations show that larger numbers of smaller systems have been installed in recent years. From 2006 to the present, CHP systems smaller than 5 MW have accounted for 27.7 percent of capacity growth.

California, like many parts of the country, has been hit hard with the recent economic downturn. Not only has this put a damper on new development of CHP, it has caused CHP capacity to decrease as industrial or commercial host sites have to shut down. In the past five years, there have been 314 MW of CHP in California that have ceased to operate because the host facility where they are located has shut down. National CHP development trends are starting to turn around, however, as the number of CHP systems in the development and construction stage are picking up again.

To estimate future CHP development trends, ICF maintains data on CHP systems in the proposed, planning, and construction stages of development. Since CHP systems can take multiple years to install, depending on the system size and host application, tracking systems in development can provide a picture of where the CHP market is heading. The ICF CHP Watch List shows that California currently has 11 sites representing 65.1 MW of CHP capacity that are expected to be installed during the next year. This figure represents only a portion of the capacity that is anticipated to actually enter the market because many companies do not publicize their CHP development plans. California has the sixth most CHP capacity under development in the country. Other states with large amounts of capacity in development are New York, Michigan, Washington, Wisconsin, and Virginia.

Additional detailed tables of existing CHP installations in California are shown in Appendix B.

CHP Technical Market Potential

This section estimates the technical market potential for combined heat and power in the industrial, commercial/institutional, and multifamily residential market sectors in California. The technical potential is an estimation of market size constrained only by technological limits — the ability of CHP technologies to fit customer energy needs. CHP technical potential is calculated in terms of CHP electrical capacity that could be installed at existing and new industrial and commercial facilities based on the estimated electric and thermal needs of the site. The technical market potential does not consider screening for economic rate of return, or other factors such as ability to retrofit, owner interest in applying CHP, capital availability, natural gas availability, or variation of energy consumption within customer application/size class.

The technical potential is useful in understanding the potential size and distribution of the target CHP market in the region. Identifying the technical market potential is a preliminary step in the assessment of actual economic market size and ultimate market penetration.

CHP is best applied at facilities that have significant and concurrent electric and thermal demands. In the industrial sector, CHP thermal output has traditionally been in the form of steam used for process heating and for space heating. For commercial and institutional users, thermal output has traditionally been steam or hot water for space heating and

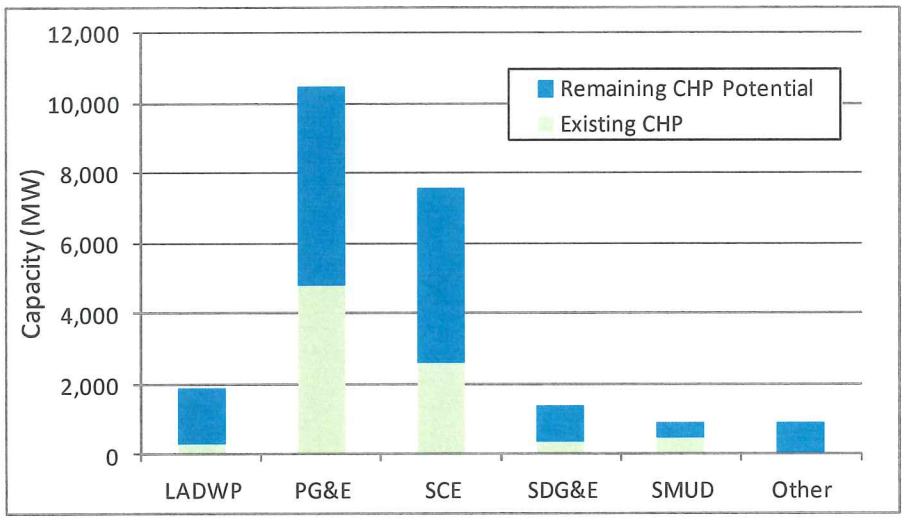
Table 20: Total CHP Technical Potential in 2030 by Utility Territory

Utility Region	50-500 kW (MW)	500-1 MW (MW)	1-5 MW (MW)	5-20 MW (MW)	>20 MW (MW)	Total (MW)
LADWP	278	228	355	253	473	1,588
PG&E	1,234	518	1,193	943	3,203	7,090
SCE	1,227	441	1,013	1,074	1,236	4,991
SDG&E	265	123	251	152	234	1,024
SMUD	98	51	105	153	24	432
Other North	68	26	68	78	149	390
Other South	125	47	114	163	0	449
Total (MW)	**3,295**	**1,434**	**3,099**	**2,815**	**5,320**	**15,964**

Source: ICF International.

Figure 9 profiles existing CHP capacity and remaining CHP potential (through 2030) by utility service area. The most significant regions for growth are in the PG&E and SCE service territories. However, both LADWP and SDG&E show that they have significant room for growth in CHP capacity.

Figure 9: Existing CHP and Total Remaining CHP Potential by Utility Territory



Source: ICF International.

The CHP Market Model will use this technical potential data to estimate forecasted CHP market penetration between 2011 and 2030. Detailed tables describing the technical potential by utility region are provided in Appendix C.

APPENDIX D: Detailed Scenario Results

Table D-1: Base Case LADWP Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	3	16	37	44	45
Commercial/Institutional	12	62	149	180	189
Residential	1	3	8	10	10
Cumulative Market Penetration, MW	16	81	194	233	244
Avoided Electric Cooling, MW	3	13	30	36	37
Scenario Grand Total	19	94	224	269	281
Annual Electric Energy (Million kWh)					
Industrial	24	120	278	325	333
Commercial/Institutional	82	409	958	1137	1,190
Residential	4	18	53	69	73
Total	**109**	**547**	**1,289**	**1,531**	**1596**
Avoided Cooling	9	43	97	114	118
Scenario Grand Total	118	590	1,386	1,644	1,714
CHP Fuel, (billion Btu/year)	1059	5,293	12,315	14,534	15,127
Avoided Boiler Fuel (Billion Btu/year)	281	1,404	3,192	3,755	3,896
Incremental Onsite Fuel (billion Btu/year)	778	3,889	9,122	10,779	11,231
Cumulative Investment (million 2011 $)	$26	$128	$322	$395	$421
Cumulative Capital Incentives(Million 2011 $)	$2	$9	$9	$9	$9
Annual Electric Energy (Million 2011 $)					
Total	**$11.71**	**$58.55**	**$152.86**	**$195.73**	**$211.67**
Avoided Cooling	$1.37	$6.86	$16.57	$20.83	$22.60
Scenario Grand Total	$13.08	$65.41	$169.43	$216.56	$234.27
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$6.88	$34.39	$97.53	$135.85	$159.82
Avoided Boiler Fuel	$2.01	$10.04	$27.39	$37.59	$43.71
Total	**$4.87**	**$24.34**	**$70.14**	**$98.26**	**$116.11**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.4	1.9	6.7	10.4	11.4
500kW-1,000kW	1.1	5.4	16.1	22.0	23.5
1-5 MW	3.3	16.3	48.7	61.1	64.3
5-20 MW	4.2	21.2	52.7	61.5	63.9
>20 MW	7.2	35.8	70.0	78.1	80.7
Total Market	**16.1**	**80.6**	**194.2**	**233.1**	**243.9**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	9	46	46	-38	-40
Cumulative Avoided CO_2 Emissions, thousand MT	9	137	368	346	150
Average unit Emissions savings, lb/MWh	170.8	170.8	73.8	-51.1	-51.2
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	14	71	169	204	213
Cumulative Avoided CO_2 Emissions, thousand MT	14	214	865	1,815	2,860
Average unit Emissions savings, lb/MWh	266.9	266.9	269.5	273.0	273.6

Source: ICF International, Inc.

Table D-2: Base Case PG&E Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	30	151	316	375	382
Commercial/Institutional	19	96	257	325	345
Residential	1	4	13	18	19
Cumulative Market Penetration, MW	50	251	586	718	745
Avoided Electric Cooling, MW	4	20	50	62	66
Scenario Grand Total	54	271	636	779	811
Annual Electric Energy (Million kWh)					
Industrial	229	1147	2355	2787	2,836
Commercial/Institutional	124	620	1624	2022	2,135
Residential	6	30	90	123	132
Total	**359**	**1,797**	**4,070**	**4,931**	**5103**
Avoided Cooling	13	64	154	188	198
Scenario Grand Total	372	1,861	4,224	5,120	5,302
CHP Fuel, (billion Btu/year)	3564	17,818	40,025	48,178	49,841
Avoided Boiler Fuel (Billion Btu/year)	1290	6,451	13,577	16,314	16,825
Incremental Onsite Fuel (billion Btu/year)	2,273	11,367	26,448	31,864	33,016
Cumulative Investment (million 2011 $)	$85	$427	$1,069	$1,345	$1,428
Cumulative Capital Incentives(Million 2011 $)	$8	$38	$38	$38	$38
Annual Electric Energy (Million 2011 $)					
Total	**$31.63**	**$158.16**	**$423.84**	**$562.11**	**$608.25**
Avoided Cooling	$2.29	$11.43	$29.34	$38.12	$41.45
Scenario Grand Total	$33.92	$169.59	$453.17	$600.23	$649.70
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$21.43	$107.14	$295.81	$422.25	$495.83
Avoided Boiler Fuel	$9.28	$46.39	$117.71	$164.11	$189.09
Total	**$12.15**	**$60.75**	**$178.10**	**$258.14**	**$306.75**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	4.4	21.8	69.0	102.6	113.0
500kW-1,000kW	2.9	14.6	43.3	58.1	61.4
1-5 MW	12.6	62.8	184.9	227.7	236.3
5-20 MW	13.2	65.8	163.0	186.6	190.1
>20 MW	17.1	85.7	126.0	142.6	144.6
Total Market	**50.1**	**250.7**	**586.2**	**717.5**	**745.5**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	39	195	232	20	17
Cumulative Avoided CO_2 Emissions, thousand MT	39	585	1,672	2,196	2,288
Average unit Emissions savings, lb/MWh	231.1	231.1	121.3	8.5	7.3
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	52	262	576	709	734
Cumulative Avoided CO_2 Emissions, thousand MT	52	787	3,040	6,319	9,939
Average unit Emissions savings, lb/MWh	310.8	310.8	300.7	305.3	305.2

Source: ICF International, Inc.

Table D-3: Base Case SCE Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	17	87	217	254	257
Commercial/Institutional	8	42	108	132	138
Residential	0	1	1	2	2
Cumulative Market Penetration, MW	26	130	326	388	397
Avoided Electric Cooling, MW	2	9	20	24	25
Scenario Grand Total	28	139	347	412	422
Annual Electric Energy (Million kWh)					
Industrial	132	661	1622	1893	1,915
Commercial/Institutional	56	282	707	850	886
Residential	1	4	9	11	12
Total	**189**	**947**	**2,337**	**2,755**	**2812**
Avoided Cooling	6	29	67	78	81
Scenario Grand Total	195	976	2,404	2,833	2,893
CHP Fuel, (billion Btu/year)	1831	9,157	22,233	26,036	26,560
Avoided Boiler Fuel (Billion Btu/year)	672	3,362	7,874	9,207	9,365
Incremental Onsite Fuel (billion Btu/year)	1,159	5,795	14,359	16,829	17,195
Cumulative Investment (million 2011 $)	$38	$192	$497	$600	$627
Cumulative Capital Incentives(Million 2011 $)	$3	$14	$14	$14	$14
Annual Electric Energy (Million 2011 $)					
Total	**$14.17**	**$70.86**	**$199.25**	**$258.89**	**$277.06**
Avoided Cooling	$0.97	$4.83	$11.76	$14.77	$15.86
Scenario Grand Total	$15.14	$75.69	$211.01	$273.66	$292.92
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$11.75	$58.77	$171.60	$236.49	$272.27
Avoided Boiler Fuel	$4.74	$23.69	$65.73	$89.47	$101.81
Total	**$7.02**	**$35.09**	**$105.87**	**$147.01**	**$170.45**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.1	0.3	4.2	9.1	10.0
500kW-1,000kW	1.3	6.7	18.9	25.9	27.1
1-5 MW	6.5	32.7	97.8	120.5	124.1
5-20 MW	9.5	47.3	123.1	141.7	144.0
>20 MW	8.6	42.9	82.3	90.5	91.5
Total Market	**26.0**	**130.0**	**326.4**	**387.6**	**396.7**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	22	111	173	64	64
Cumulative Avoided CO_2 Emissions, thousand MT	22	332	1,074	1,612	1,932
Average unit Emissions savings, lb/MWh	250.1	250.1	159.1	49.6	48.7
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	30	148	362	432	441
Cumulative Avoided CO_2 Emissions, thousand MT	30	444	1,827	3,847	6,033
Average unit Emissions savings, lb/MWh	334.6	334.6	331.9	336.2	335.9

Source: ICF International, Inc.

Table D-4: Base Case SDG&E Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	5	25	56	64	65
Commercial/Institutional	5	26	69	88	94
Residential	0	1	2	3	3
Cumulative Market Penetration, MW	10	52	128	155	162
Avoided Electric Cooling, MW	1	5	13	17	18
Scenario Grand Total	11	57	141	172	180
Annual Electric Energy (Million kWh)					
Industrial	39	194	426	488	495
Commercial/Institutional	33	164	436	546	581
Residential	1	6	17	22	23
Total	**73**	**364**	**879**	**1,055**	**1099**
Avoided Cooling	3	17	42	51	54
Scenario Grand Total	76	381	921	1,107	1,153
CHP Fuel, (billion Btu/year)	720	3,601	8,578	10,239	10,644
Avoided Boiler Fuel (Billion Btu/year)	242	1,209	2,713	3,208	3,314
Incremental Onsite Fuel (billion Btu/year)	478	2,392	5,864	7,031	7,330
Cumulative Investment (million 2011 $)	$16	$82	$215	$270	$289
Cumulative Capital Incentives(Million 2011 $)	$1	$7	$7	$7	$7
Annual Electric Energy (Million 2011 $)					
Total	**$6.30**	**$31.48**	**$87.04**	**$116.12**	**$127.28**
Avoided Cooling	$0.63	$3.16	$8.19	$10.64	$11.62
Scenario Grand Total	$6.93	$34.64	$95.23	$126.76	$138.90
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$4.66	$23.31	$66.44	$93.33	$109.38
Avoided Boiler Fuel	$2.15	$10.73	$27.26	$36.51	$41.47
Total	**$2.52**	**$12.58**	**$39.18**	**$56.81**	**$67.91**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.7	3.5	11.1	16.7	18.2
500kW-1,000kW	0.7	3.7	11.0	14.8	15.6
1-5 MW	2.6	13.0	38.4	47.9	50.2
5-20 MW	2.5	12.7	31.6	37.3	39.3
>20 MW	3.7	18.6	35.5	38.6	38.9
Total Market	**10.3**	**51.5**	**127.6**	**155.2**	**162.2**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	7	37	50	5	5
Cumulative Avoided CO_2 Emissions, thousand MT	7	110	333	449	474
Average unit Emissions savings, lb/MWh	212.3	212.3	119.4	10.9	8.6
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	10	50	117	143	149
Cumulative Avoided CO_2 Emissions, thousand MT	10	149	600	1,264	1,997
Average unit Emissions savings, lb/MWh	287.4	287.4	281.1	284.8	284.7

Source: ICF International, Inc.

Table D-5: Base Case SMUD Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	1	5	14	17	17
Commercial/Institutional	2	11	27	33	34
Residential	0	0	1	1	1
Cumulative Market Penetration, MW	3	16	42	51	53
Avoided Electric Cooling, MW	0	2	5	6	6
Scenario Grand Total	4	18	47	57	59
Annual Electric Energy (Million kWh)					
Industrial	7	35	99	120	123
Commercial/Institutional	13	65	160	191	200
Residential	0	2	6	8	9
Total	**21**	**103**	**264**	**319**	**332**
Avoided Cooling	1	7	15	17	18
Scenario Grand Total	22	109	279	336	350
CHP Fuel, (billion Btu/year)	203	1,017	2,563	3,066	3,186
Avoided Boiler Fuel (Billion Btu/year)	62	310	765	919	953
Incremental Onsite Fuel (billion Btu/year)	141	707	1,798	2,148	2,233
Cumulative Investment (million 2011 $)	$5	$26	$70	$87	$92
Cumulative Capital Incentives(Million 2011 $)	$0	$2	$2	$2	$2
Annual Electric Energy (Million 2011 $)					
Total	**$1.99**	**$9.96**	**$28.15**	**$36.88**	**$39.99**
Avoided Cooling	$0.16	$0.81	$1.98	$2.49	$2.68
Scenario Grand Total	$2.15	$10.77	$30.13	$39.36	$42.66
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$1.24	$6.18	$19.02	$27.01	$31.85
Avoided Boiler Fuel	$0.46	$2.29	$6.67	$9.29	$10.75
Total	**$0.78**	**$3.89**	**$12.34**	**$17.71**	**$21.09**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.1	0.5	1.8	2.7	2.9
500kW-1,000kW	0.2	1.0	2.8	3.8	4.0
1-5 MW	0.9	4.7	13.8	16.9	17.5
5-20 MW	1.3	6.4	16.6	19.8	20.8
>20 MW	0.7	3.4	6.7	7.4	7.6
Total Market	**3.2**	**16.0**	**41.7**	**50.6**	**52.8**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	2	9	12	-4	-4
Cumulative Avoided CO_2 Emissions, thousand MT	2	28	81	94	75
Average unit Emissions savings, lb/MWh	185.9	185.9	92.9	-24.9	-23.9
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	3	14	36	44	46
Cumulative Avoided CO_2 Emissions, thousand MT	3	42	178	383	612
Average unit Emissions savings, lb/MWh	282.5	282.5	284.4	291.1	292.0

Source: ICF International, Inc.

Table D-6: Base Case Other North Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	3	13	32	38	40
Commercial/Institutional	1	4	10	13	14
Residential	0	0	0	0	0
Cumulative Market Penetration, MW	3	16	42	51	54
Avoided Electric Cooling, MW	0	1	2	2	2
Scenario Grand Total	3	17	44	53	56
Annual Electric Energy (Million kWh)					
Industrial	19	95	234	281	293
Commercial/Institutional	4	22	61	77	81
Residential	0	0	0	1	1
Total	**23**	**117**	**295**	**358**	**375**
Avoided Cooling	0	2	5	6	7
Scenario Grand Total	24	119	301	365	381
CHP Fuel, (billion Btu/year)	232	1,158	2,876	3,457	3,606
Avoided Boiler Fuel (Billion Btu/year)	92	461	1,088	1,305	1,361
Incremental Onsite Fuel (billion Btu/year)	139	697	1,788	2,152	2,246
Cumulative Investment (million 2011 $)	$5	$26	$69	$86	$91
Cumulative Capital Incentives(Million 2011 $)	$0	$2	$2	$2	$2
Annual Electric Energy (Million 2011 $)					
Total	**$2.28**	**$11.38**	**$32.29**	**$42.45**	**$46.19**
Avoided Cooling	$0.06	$0.30	$0.81	$1.07	$1.17
Scenario Grand Total	$2.34	$11.68	$33.10	$43.52	$47.36
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$1.38	$6.89	$20.81	$29.67	$35.11
Avoided Boiler Fuel	$0.66	$3.32	$9.27	$12.88	$14.98
Total	**$0.71**	**$3.57**	**$11.55**	**$16.79**	**$20.12**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.2	0.9	2.8	4.3	4.7
500kW-1,000kW	0.2	0.9	2.7	3.6	3.9
1-5 MW	0.7	3.7	10.9	13.5	14.0
5-20 MW	1.7	8.6	21.3	24.9	25.8
>20 MW	0.5	2.4	4.3	5.0	5.2
Total Market	**3.3**	**16.4**	**42.0**	**51.2**	**53.6**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	3	14	22	9	9
Cumulative Avoided CO_2 Emissions, thousand MT	3	42	136	206	253
Average unit Emissions savings, lb/MWh	257.5	257.5	162.1	53.8	54.7
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	4	18	46	56	59
Cumulative Avoided CO_2 Emissions, thousand MT	4	55	228	488	778
Average unit Emissions savings, lb/MWh	339.7	339.7	334.6	340.6	341.9

Source: ICF International, Inc.

Table D-7: Base Case Other South Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	2	11	31	37	39
Commercial/Institutional	2	9	25	31	33
Residential	0	0	0	0	0
Cumulative Market Penetration, MW	4	20	55	68	71
Avoided Electric Cooling, MW	0	2	4	5	6
Scenario Grand Total	4	22	60	74	77
Annual Electric Energy (Million kWh)					
Industrial	16	79	220	269	277
Commercial/Institutional	12	62	167	206	217
Residential	0	0	0	0	0
Total	**28**	**141**	**387**	**475**	**494**
Avoided Cooling	1	6	15	18	19
Scenario Grand Total	29	147	402	493	512
CHP Fuel, (billion Btu/year)	286	1,428	3,812	4,629	4,806
Avoided Boiler Fuel (Billion Btu/year)	98	492	1,265	1,541	1,597
Incremental Onsite Fuel (billion Btu/year)	187	935	2,548	3,088	3,208
Cumulative Investment (million 2011 $)	$7	$33	$94	$119	$127
Cumulative Capital Incentives(Million 2011 $)	$1	$4	$4	$4	$4
Annual Electric Energy (Million 2011 $)					
Total	**$3.06**	**$15.29**	**$45.72**	**$60.42**	**$65.18**
Avoided Cooling	$0.18	$0.90	$2.36	$3.05	$3.30
Scenario Grand Total	$3.24	$16.19	$48.08	$63.46	$68.48
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$1.88	$9.40	$30.45	$43.55	$51.02
Avoided Boiler Fuel	$0.74	$3.69	$11.26	$15.94	$18.45
Total	**$1.14**	**$5.71**	**$19.19**	**$27.61**	**$32.57**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.3	1.4	5.0	7.6	8.2
500kW-1,000kW	0.3	1.6	4.6	6.1	6.4
1-5 MW	1.3	6.5	19.1	23.4	24.2
5-20 MW	2.1	10.6	26.7	31.2	32.3
>20 MW	0.0	0.0	0.0	0.0	0.0
Total Market	**4.0**	**20.1**	**55.4**	**68.3**	**71.1**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	3	13	18	-4	-4
Cumulative Avoided CO_2 Emissions, thousand MT	3	40	122	146	125
Average unit Emissions savings, lb/MWh	198.3	198.3	101.3	-18.9	-17.8
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	4	20	54	69	71
Cumulative Avoided CO_2 Emissions, thousand MT	4	60	263	578	929
Average unit Emissions savings, lb/MWh	298.2	298.2	298.8	306.7	307.6

Source: ICF International, Inc.

Table D-8: Medium Case LADWP Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	10	50	124	141	142
Commercial/Institutional	13	67	170	205	216
Residential	1	3	9	12	13
Cumulative Market Penetration, MW	24	120	304	358	371
Avoided Electric Cooling, MW	3	14	34	41	42
Scenario Grand Total	27	134	338	399	414
Annual Electric Energy (Million kWh)					
Industrial	79	395	973	1103	1,116
Commercial/Institutional	88	440	1077	1283	1,345
Residential	4	20	66	85	90
Total	**171**	**855**	**2,117**	**2,471**	**2551**
Avoided Cooling	9	46	109	128	133
Scenario Grand Total	180	902	2,226	2,599	2,685
CHP Fuel, (billion Btu/year)	1633	8,164	19,935	23,161	23,893
Avoided Boiler Fuel (Billion Btu/year)	516	2,578	6,216	7,155	7,339
Incremental Onsite Fuel (billion Btu/year)	1,117	5,586	13,719	16,006	16,554
Cumulative Investment (million 2011 $)	$36	$180	$458	$552	$586
Cumulative Capital Incentives(Million 2011 $)	$2	$10	$28	$32	$32
Annual Electric Energy (Million 2011 $)					
Total	**$16.05**	**$80.27**	**$218.32**	**$278.36**	**$302.29**
Avoided Cooling	$1.48	$7.38	$18.56	$23.42	$25.43
Scenario Grand Total	$17.53	$87.64	$236.88	$301.78	$327.72
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$10.24	$51.18	$146.97	$200.66	$233.61
Avoided Boiler Fuel	$3.49	$17.47	$48.25	$64.39	$73.83
Total	**$6.74**	**$33.71**	**$98.72**	**$136.27**	**$159.78**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.5	2.3	10.3	15.5	16.9
500kW-1,000kW	1.2	6.2	21.4	28.9	30.8
1-5 MW	3.6	18.0	58.2	72.7	76.5
5-20 MW	4.5	22.4	56.6	66.0	68.5
>20 MW	14.2	71.1	157.1	175.1	178.6
Total Market	**24.0**	**120.1**	**303.5**	**358.1**	**371.3**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	18	91	160	77	76
Cumulative Avoided CO_2 Emissions, thousand MT	18	274	936	1,485	1,866
Average unit Emissions savings, lb/MWh	223.5	223.5	158.1	65.1	62.1
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	24	119	299	351	362
Cumulative Avoided CO_2 Emissions, thousand MT	24	357	1,492	3,143	4,932
Average unit Emissions savings, lb/MWh	291.3	291.3	295.9	297.8	297.6

Source: ICF International, Inc.

Table D-9: Medium Case PG&E Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	95	473	1194	1357	1,373
Commercial/Institutional	21	105	305	386	411
Residential	1	5	17	22	24
Cumulative Market Penetration, MW	117	583	1,515	1,766	1807
Avoided Electric Cooling, MW	4	22	58	73	77
Scenario Grand Total	121	605	1,573	1,839	1,884
Annual Electric Energy (Million kWh)					
Industrial	747	3735	9396	10666	10,781
Commercial/Institutional	136	680	1898	2372	2,509
Residential	7	35	116	157	169
Total	**890**	**4,450**	**11,410**	**13,196**	**13458**
Avoided Cooling	14	70	178	219	231
Scenario Grand Total	904	4,519	11,588	13,415	13,689
CHP Fuel, (billion Btu/year)	8487	42,434	107,169	123,564	126,058
Avoided Boiler Fuel (Billion Btu/year)	3396	16,980	41,783	47,950	48,784
Incremental Onsite Fuel (billion Btu/year)	5,091	25,454	65,387	75,614	77,274
Cumulative Investment (million 2011 $)	$176	$878	$2,274	$2,713	$2,821
Cumulative Capital Incentives(Million 2011 $)	$9	$43	$114	$129	$133
Annual Electric Energy (Million 2011 $)					
Total	**$65.70**	**$328.49**	**$932.58**	**$1,202.30**	**$1,313.28**
Avoided Cooling	$2.50	$12.49	$33.92	$44.27	$48.20
Scenario Grand Total	$68.20	$340.98	$966.50	$1,246.57	$1,361.49
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$48.35	$241.76	$693.35	$938.71	$1,081.59
Avoided Boiler Fuel	$22.35	$111.75	$305.57	$404.12	$457.98
Total	**$26.00**	**$130.01**	**$387.78**	**$534.59**	**$623.61**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	5.3	26.5	93.5	137.4	151.1
500kW-1,000kW	3.3	16.7	56.5	75.0	79.2
1-5 MW	13.8	69.1	218.4	268.1	278.2
5-20 MW	13.9	69.6	174.1	199.0	202.8
>20 MW	80.3	401.3	972.5	1,086.9	1,095.9
Total Market	**116.6**	**583.2**	**1514.8**	**1766.3**	**1807.1**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	122	608	1350	1236	1242
Cumulative Avoided CO_2 Emissions, thousand MT	122	1,823	7,089	13,497	19,696
Average unit Emissions savings, lb/MWh	296.5	296.5	256.9	203.1	200.1
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	136	681	1749	2039	2078
Cumulative Avoided CO_2 Emissions, thousand MT	136	2,044	8,653	18,268	28,580
Average unit Emissions savings, lb/MWh	332.4	332.4	332.7	335.1	334.7

Source: ICF International, Inc.

Table D-10: Medium Case SCE Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	38	189	488	559	564
Commercial/Institutional	9	46	131	160	167
Residential	0	1	2	3	3
Cumulative Market Penetration, MW	47	235	621	721	734
Avoided Electric Cooling, MW	2	9	24	28	29
Scenario Grand Total	49	245	645	749	764
Annual Electric Energy (Million kWh)					
Industrial	295	1476	3779	4315	4,356
Commercial/Institutional	61	305	838	1011	1,054
Residential	1	4	16	20	20
Total	**357**	**1,785**	**4,633**	**5,346**	**5431**
Avoided Cooling	6	31	78	92	95
Scenario Grand Total	363	1,817	4,711	5,437	5,526
CHP Fuel, (billion Btu/year)	3385	16,924	43,332	49,766	50,546
Avoided Boiler Fuel (Billion Btu/year)	1335	6,674	16,656	19,080	19,338
Incremental Onsite Fuel (billion Btu/year)	2,050	10,250	26,676	30,687	31,208
Cumulative Investment (million 2011 $)	$65	$326	$856	$1,009	$1,047
Cumulative Capital Incentives(Million 2011 $)	$3	$15	$45	$51	$52
Annual Electric Energy (Million 2011 $)					
Total	**$25.15**	**$125.76**	**$365.12**	**$466.93**	**$504.84**
Avoided Cooling	$1.04	$5.19	$13.73	$17.25	$18.52
Scenario Grand Total	$26.19	$130.95	$378.85	$484.17	$523.37
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$20.76	$103.81	$307.05	$412.33	$471.03
Avoided Boiler Fuel	$8.91	$44.54	$126.71	$167.76	$189.54
Total	**$11.85**	**$59.27**	**$180.34**	**$244.57**	**$281.49**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.1	0.5	10.8	18.4	20.1
500kW-1,000kW	1.5	7.7	29.2	38.7	40.4
1-5 MW	7.2	36.2	123.1	150.6	155.1
5-20 MW	10.0	50.1	132.3	152.1	154.6
>20 MW	28.2	140.9	325.4	361.2	364.1
Total Market	**47.1**	**235.3**	**620.8**	**721.1**	**734.2**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	48	241	507	413	416
Cumulative Avoided CO_2 Emissions, thousand MT	48	723	2,724	4,976	7,048
Average unit Emissions savings, lb/MWh	292.4	292.4	237.0	167.4	165.8
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	56	281	730	851	865
Cumulative Avoided CO_2 Emissions, thousand MT	56	844	3,597	7,610	11,906
Average unit Emissions savings, lb/MWh	341.4	341.4	341.7	345.0	344.9

Source: ICF International, Inc.

Table D-11: Medium Case SDG&E Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	14	69	146	163	164
Commercial/Institutional	6	28	82	104	111
Residential	0	1	3	4	4
Cumulative Market Penetration, MW	20	98	231	270	279
Avoided Electric Cooling, MW	1	6	16	19	21
Scenario Grand Total	21	104	247	290	300
Annual Electric Energy (Million kWh)					
Industrial	109	546	1150	1275	1,287
Commercial/Institutional	36	179	508	638	679
Residential	1	6	21	27	29
Total	**146**	**731**	**1,679**	**1,940**	**1994**
Avoided Cooling	4	19	48	59	63
Scenario Grand Total	150	750	1,728	1,999	2,057
CHP Fuel, (billion Btu/year)	1403	7,014	15,968	18,390	18,903
Avoided Boiler Fuel (Billion Btu/year)	531	2,655	5,725	6,513	6,655
Incremental Onsite Fuel (billion Btu/year)	872	4,360	10,243	11,877	12,248
Cumulative Investment (million 2011 $)	$28	$142	$342	$412	$437
Cumulative Capital Incentives(Million 2011 $)	$2	$8	$23	$26	$27
Annual Electric Energy (Million 2011 $)					
Total	**$11.36**	**$56.81**	**$149.53**	**$193.31**	**$212.09**
Avoided Cooling	$0.69	$3.44	$9.43	$12.30	$13.43
Scenario Grand Total	$12.05	$60.25	$158.96	$205.61	$225.52
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$8.68	$43.41	$114.33	$154.34	$178.47
Avoided Boiler Fuel	$4.57	$22.87	$54.11	$69.19	$77.36
Total	**$4.11**	**$20.54**	**$60.22**	**$85.15**	**$101.12**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.8	4.2	15.7	23.1	25.2
500kW-1,000kW	0.9	4.3	14.4	19.1	20.1
1-5 MW	2.9	14.3	45.6	56.7	59.4
5-20 MW	2.7	13.4	33.6	39.7	41.8
>20 MW	12.3	61.6	121.7	131.7	132.5
Total Market	**19.6**	**97.8**	**231.0**	**270.2**	**279.0**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	19	93	163	120	120
Cumulative Avoided CO_2 Emissions, thousand MT	19	279	955	1,642	2,242
Average unit Emissions savings, lb/MWh	273.7	273.7	208.2	132.6	128.3
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	21	107	242	281	289
Cumulative Avoided CO_2 Emissions, thousand MT	21	322	1,262	2,591	4,021
Average unit Emissions savings, lb/MWh	315.4	315.4	308.9	310.3	309.7

Source: ICF International, Inc.

Table D-12: Medium Case SMUD Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	1	5	16	19	20
Commercial/Institutional	2	12	31	38	40
Residential	0	0	1	2	2
Cumulative Market Penetration, MW	3	17	48	58	61
Avoided Electric Cooling, MW	0	2	6	7	7
Scenario Grand Total	4	20	54	65	68
Annual Electric Energy (Million kWh)					
Industrial	8	38	113	137	141
Commercial/Institutional	14	70	182	219	229
Residential	0	2	8	11	11
Total	**22**	**111**	**303**	**366**	**382**
Avoided Cooling	1	7	17	20	20
Scenario Grand Total	24	118	320	386	402
CHP Fuel, (billion Btu/year)	220	1,102	2,942	3,527	3,665
Avoided Boiler Fuel (Billion Btu/year)	67	337	883	1,063	1,102
Incremental Onsite Fuel (billion Btu/year)	153	765	2,059	2,464	2,563
Cumulative Investment (million 2011 $)	$6	$29	$78	$97	$104
Cumulative Capital Incentives(Million 2011 $)	$0	$2	$7	$7	$8
Annual Electric Energy (Million 2011 $)					
Total	**$2.16**	**$10.79**	**$32.48**	**$42.63**	**$46.24**
Avoided Cooling	$0.17	$0.87	$2.24	$2.82	$3.03
Scenario Grand Total	$2.33	$11.66	$34.72	$45.45	$49.27
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$1.34	$6.69	$21.90	$31.17	$36.77
Avoided Boiler Fuel	$0.50	$2.49	$7.77	$10.84	$12.54
Total	**$0.84**	**$4.20**	**$14.13**	**$20.33**	**$24.22**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.1	0.7	2.5	3.7	4.1
500kW-1,000kW	0.2	1.1	3.9	5.2	5.5
1-5 MW	1.0	5.2	16.7	20.4	21.0
5-20 MW	1.4	6.8	17.8	21.2	22.2
>20 MW	0.7	3.6	7.1	7.9	8.1
Total Market	**3.5**	**17.3**	**48.0**	**58.4**	**61.0**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	2	10	13	-5	-5
Cumulative Avoided CO_2 Emissions, thousand MT	2	30	90	102	78
Average unit Emissions savings, lb/MWh	185.6	185.6	92.1	-27.3	-26.5
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	3	15	41	51	53
Cumulative Avoided CO_2 Emissions, thousand MT	3	45	200	436	699
Average unit Emissions savings, lb/MWh	282.5	282.5	285.5	292.1	293.0

Source: ICF International, Inc.

Table D-13: Medium Case Other North Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	6	29	74	87	91
Commercial/Institutional	1	4	12	15	16
Residential	0	0	0	0	0
Cumulative Market Penetration, MW	7	33	86	102	107
Avoided Electric Cooling, MW	0	1	2	3	3
Scenario Grand Total	7	34	88	105	110
Annual Electric Energy (Million kWh)					
Industrial	45	223	569	670	701
Commercial/Institutional	5	24	72	91	96
Residential	0	0	1	1	1
Total	**49**	**247**	**641**	**762**	**799**
Avoided Cooling	0	2	6	7	8
Scenario Grand Total	50	249	647	770	807
CHP Fuel, (billion Btu/year)	474	2,372	6,042	7,142	7,471
Avoided Boiler Fuel (Billion Btu/year)	197	983	2,423	2,859	2,991
Incremental Onsite Fuel (billion Btu/year)	278	1,389	3,619	4,283	4,481
Cumulative Investment (million 2011 $)	$10	$48	$123	$149	$159
Cumulative Capital Incentives(Million 2011 $)	$0	$2	$7	$7	$8
Annual Electric Energy (Million 2011 $)					
Total	**$3.98**	**$19.90**	**$57.07**	**$74.68**	**$82.91**
Avoided Cooling	$0.07	$0.33	$0.95	$1.26	$1.38
Scenario Grand Total	$4.05	$20.23	$58.02	$75.94	$84.28
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$2.69	$13.47	$39.49	$54.84	$64.70
Avoided Boiler Fuel	$1.31	$6.54	$18.16	$24.68	$28.70
Total	**$1.39**	**$6.93**	**$21.33**	**$30.16**	**$36.00**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.2	1.0	4.0	5.9	6.5
500kW-1,000kW	0.2	1.0	3.5	4.7	5.0
1-5 MW	0.8	4.0	12.7	15.6	16.2
5-20 MW	1.8	9.1	22.8	26.6	27.6
>20 MW	3.5	17.7	42.8	49.7	52.2
Total Market	**6.6**	**32.8**	**85.8**	**102.5**	**107.4**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	7	34	74	67	71
Cumulative Avoided CO_2 Emissions, thousand MT	7	103	394	744	1,093
Average unit Emissions savings, lb/MWh	302.4	302.4	252.8	193.2	194.5
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	8	39	101	122	128
Cumulative Avoided CO_2 Emissions, thousand MT	8	117	498	1,066	1,694
Average unit Emissions savings, lb/MWh	344.8	344.8	344.4	349.0	350.2

Source: ICF International, Inc.

Table D-14: Medium Case Other South Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	2	12	36	43	45
Commercial/Institutional	2	10	29	36	38
Residential	0	0	0	0	0
Cumulative Market Penetration, MW	4	22	65	80	83
Avoided Electric Cooling, MW	0	2	5	6	7
Scenario Grand Total	5	24	70	86	90
Annual Electric Energy (Million kWh)					
Industrial	17	87	255	311	321
Commercial/Institutional	13	67	193	239	252
Residential	0	0	0	0	0
Total	**31**	**154**	**448**	**551**	**573**
Avoided Cooling	1	7	17	20	21
Scenario Grand Total	32	160	465	571	594
CHP Fuel, (billion Btu/year)	312	1,559	4,421	5,381	5,589
Avoided Boiler Fuel (Billion Btu/year)	108	541	1,478	1,805	1,872
Incremental Onsite Fuel (billion Btu/year)	204	1,019	2,942	3,575	3,716
Cumulative Investment (million 2011 $)	$7	$36	$105	$133	$145
Cumulative Capital Incentives(Million 2011 $)	$1	$4	$11	$13	$13
Annual Electric Energy (Million 2011 $)					
Total	**$3.34**	**$16.69**	**$53.18**	**$70.44**	**$76.03**
Avoided Cooling	$0.19	$0.97	$2.69	$3.49	$3.79
Scenario Grand Total	$3.53	$17.66	$55.87	$73.93	$79.82
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$2.06	$10.28	$35.42	$50.77	$59.51
Avoided Boiler Fuel	$0.81	$4.06	$13.26	$18.81	$21.78
Total	**$1.24**	**$6.21**	**$22.16**	**$31.96**	**$37.73**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.3	1.7	7.2	10.7	11.6
500kW-1,000kW	0.4	1.8	6.0	7.9	8.3
1-5 MW	1.4	7.1	22.8	27.8	28.6
5-20 MW	2.3	11.3	28.6	33.4	34.6
>20 MW	0.0	0.0	0.0	0.0	0.0
Total Market	**4.4**	**21.9**	**64.6**	**79.7**	**83.0**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	3	14	22	-5	-5
Cumulative Avoided CO_2 Emissions, thousand MT	3	43	137	165	140
Average unit Emissions savings, lb/MWh	198.4	198.4	102.1	-19.2	-18.3
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	4	22	63	80	83
Cumulative Avoided CO_2 Emissions, thousand MT	4	65	299	666	1,076
Average unit Emissions savings, lb/MWh	298.4	298.4	300.8	308.5	309.3

Source: ICF International, Inc.

Table D-15: High Case LADWP Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	19	95	256	293	296
Commercial/Institutional	17	87	240	300	319
Residential	1	4	14	18	20
Cumulative Market Penetration, MW	37	186	509	611	635
Avoided Electric Cooling, MW	4	18	48	59	63
Scenario Grand Total	41	205	557	670	698
Annual Electric Energy (Million kWh)					
Industrial	151	757	2027	2314	2,341
Commercial/Institutional	111	557	1476	1818	1,925
Residential	5	27	97	129	138
Total	**268**	**1,341**	**3,599**	**4,261**	**4404**
Avoided Cooling	12	59	149	181	191
Scenario Grand Total	280	1,400	3,748	4,441	4,595
CHP Fuel, (billion Btu/year)	2392	11,962	31,879	37,763	39,078
Avoided Boiler Fuel (Billion Btu/year)	624	3,118	8,247	9,748	10,064
Incremental Onsite Fuel (billion Btu/year)	1,769	8,843	23,633	28,014	29,014
Cumulative Investment (million 2011 $)	$50	$252	$669	$812	$816
Cumulative Capital Incentives(Million 2011 $)	$3	$17	$60	$78	$83
Annual Electric Energy (Million 2011 $)					
Total	**$23.61**	**$118.04**	**$345.82**	**$450.69**	**$493.60**
Avoided Cooling	$1.88	$9.38	$25.47	$33.20	$36.42
Scenario Grand Total	$25.48	$127.41	$371.28	$483.89	$530.02
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$13.88	$69.38	$196.31	$265.53	$305.63
Avoided Boiler Fuel	$4.02	$20.11	$56.43	$75.52	$85.99
Total	**$9.85**	**$49.27**	**$139.87**	**$190.01**	**$219.63**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	1.1	5.6	23.8	36.9	40.8
500kW-1,000kW	1.9	9.3	33.8	47.2	51.0
1-5 MW	4.9	24.3	84.4	108.7	115.6
5-20 MW	6.0	29.8	80.0	94.8	98.7
>20 MW	23.4	117.2	287.3	323.5	329.0
Total Market	**37.2**	**186.2**	**509.4**	**611.1**	**635.1**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	27	135	268	159	156
Cumulative Avoided CO_2 Emissions, thousand MT	27	405	1,478	2,490	3,276
Average unit Emissions savings, lb/MWh	212.3	212.3	157.5	78.9	75.0
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	34	170	458	545	564
Cumulative Avoided CO_2 Emissions, thousand MT	34	510	2,223	4,775	7,559
Average unit Emissions savings, lb/MWh	267.6	267.6	269.3	270.8	270.8

Source: ICF International, Inc.

Table D-16: High Case PG&E Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	98	491	1429	1665	1,688
Commercial/Institutional	35	173	524	683	733
Residential	2	9	30	41	45
Cumulative Market Penetration, MW	135	673	1,983	2,390	2466
Avoided Electric Cooling, MW	7	36	100	129	138
Scenario Grand Total	142	709	2,083	2,519	2,605
Annual Electric Energy (Million kWh)					
Industrial	768	3842	11147	12958	13,129
Commercial/Institutional	221	1103	3230	4145	4,427
Residential	12	60	208	290	313
Total	**1001**	**5,005**	**14,585**	**17,393**	**17870**
Avoided Cooling	23	113	303	383	407
Scenario Grand Total	1024	5,118	14,887	17,776	18,277
CHP Fuel, (billion Btu/year)	9047	45,233	130,062	155,339	159,882
Avoided Boiler Fuel (Billion Btu/year)	2803	14,013	39,223	46,929	48,249
Incremental Onsite Fuel (billion Btu/year)	6,244	31,220	90,838	108,410	111,634
Cumulative Investment (million 2011 $)	$195	$974	$2,732	$3,334	$3,312
Cumulative Capital Incentives(Million 2011 $)	$16	$79	$262	$340	$361
Annual Electric Energy (Million 2011 $)					
Total	**$88.69**	**$443.46**	**$1,395.87**	**$1,842.30**	**$2,010.34**
Avoided Cooling	$4.42	$22.11	$62.73	$83.81	$91.98
Scenario Grand Total	$93.11	$465.57	$1,458.61	$1,926.11	$2,102.33
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$49.27	$246.34	$752.25	$1,032.53	$1,188.10
Avoided Boiler Fuel	$18.43	$92.15	$272.43	$368.49	$417.39
Total	**$30.84**	**$154.20**	**$479.82**	**$664.03**	**$770.71**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	9.5	47.3	170.5	257.2	285.7
500kW-1,000kW	5.7	28.7	98.6	134.3	143.0
1-5 MW	21.5	107.4	354.3	444.9	464.6
5-20 MW	22.8	113.8	316.0	369.1	376.9
>20 MW	75.2	375.8	1,043.5	1,184.6	1,196.3
Total Market	**134.6**	**673.0**	**1982.9**	**2390.2**	**2466.5**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	111	554	1289	994	992
Cumulative Avoided CO_2 Emissions, thousand MT	111	1,662	6,638	12,198	17,163
Average unit Emissions savings, lb/MWh	238.7	238.7	190.9	123.3	119.7
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	134	669	1937	2330	2393
Cumulative Avoided CO_2 Emissions, thousand MT	134	2,007	9,158	20,023	31,863
Average unit Emissions savings, lb/MWh	288.2	288.2	286.9	289.0	288.7

Source: ICF International, Inc.

Table D-17: High Case SCE Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	73	367	1022	1197	1,213
Commercial/Institutional	23	117	366	479	513
Residential	1	3	11	16	17
Cumulative Market Penetration, MW	97	487	1,399	1,692	1743
Avoided Electric Cooling, MW	5	24	69	89	95
Scenario Grand Total	102	511	1,468	1,781	1,839
Annual Electric Energy (Million kWh)					
Industrial	568	2838	7856	9176	9,294
Commercial/Institutional	151	757	2285	2939	3,138
Residential	4	21	78	109	118
Total	**723**	**3,616**	**10,220**	**12,224**	**12550**
Avoided Cooling	16	78	214	270	286
Scenario Grand Total	739	3,694	10,434	12,494	12,836
CHP Fuel, (billion Btu/year)	6609	33,046	92,730	110,951	114,041
Avoided Boiler Fuel (Billion Btu/year)	2156	10,782	29,606	35,536	36,461
Incremental Onsite Fuel (billion Btu/year)	4,453	22,263	63,124	75,414	77,580
Cumulative Investment (million 2011 $)	$131	$655	$1,816	$2,221	$2,205
Cumulative Capital Incentives(Million 2011 $)	$11	$54	$194	$254	$268
Annual Electric Energy (Million 2011 $)					
Total	**$58.69**	**$293.45**	**$918.03**	**$1,211.67**	**$1,316.43**
Avoided Cooling	$2.96	$14.79	$43.09	$57.68	$63.37
Scenario Grand Total	$61.65	$308.24	$961.11	$1,269.34	$1,379.80
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$38.53	$192.64	$573.87	$783.70	$895.56
Avoided Boiler Fuel	$14.19	$70.96	$206.94	$280.98	$317.49
Total	**$24.34**	**$121.69**	**$366.93**	**$502.72**	**$578.07**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	5.6	28.1	117.4	180.0	197.3
500kW-1,000kW	4.3	21.6	77.0	104.8	110.8
1-5 MW	16.9	84.5	288.2	362.4	377.4
5-20 MW	21.6	108.0	303.6	357.1	364.0
>20 MW	48.9	244.4	613.1	687.5	693.9
Total Market	**97.3**	**486.6**	**1399.3**	**1691.8**	**1743.4**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	82	412	882	617	617
Cumulative Avoided CO_2 Emissions, thousand MT	82	1,237	4,708	8,325	11,410
Average unit Emissions savings, lb/MWh	246.0	246.0	186.4	108.9	106.0
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	101	504	1418	1717	1763
Cumulative Avoided CO_2 Emissions, thousand MT	101	1,513	6,777	14,765	23,488
Average unit Emissions savings, lb/MWh	301.1	301.1	299.7	303.0	302.8

Source: ICF International, Inc.

Table D-18: High Case SDG&E Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	22	110	255	286	289
Commercial/Institutional	9	44	135	177	190
Residential	0	1	5	7	7
Cumulative Market Penetration, MW	31	155	395	470	487
Avoided Electric Cooling, MW	2	9	26	33	36
Scenario Grand Total	33	164	420	503	522
Annual Electric Energy (Million kWh)					
Industrial	174	868	2004	2245	2,269
Commercial/Institutional	55	276	831	1075	1,155
Residential	2	10	36	48	51
Total	**231**	**1,154**	**2,870**	**3,367**	**3475**
Avoided Cooling	6	29	79	100	107
Scenario Grand Total	237	1,183	2,949	3,467	3,582
CHP Fuel, (billion Btu/year)	2041	10,207	25,515	30,056	31,077
Avoided Boiler Fuel (Billion Btu/year)	583	2,917	7,160	8,450	8,721
Incremental Onsite Fuel (billion Btu/year)	1,458	7,290	18,355	21,606	22,356
Cumulative Investment (million 2011 $)	$41	$204	$513	$621	$623
Cumulative Capital Incentives(Million 2011 $)	$3	$16	$54	$70	$74
Annual Electric Energy (Million 2011 $)					
Total	**$18.84**	**$94.20**	**$266.55**	**$350.37**	**$385.80**
Avoided Cooling	$1.17	$5.85	$16.90	$22.58	$24.84
Scenario Grand Total	$20.01	$100.04	$283.44	$372.94	$410.64
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$12.05	$60.25	$159.85	$214.53	$246.26
Avoided Boiler Fuel	$4.90	$24.52	$62.70	$81.39	$90.86
Total	$7.15	$35.73	$97.15	$133.15	$155.40
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	1.8	8.8	32.7	49.1	53.9
500kW-1,000kW	1.4	6.8	23.6	32.2	34.2
1-5 MW	4.2	21.2	71.2	90.7	95.9
5-20 MW	4.3	21.6	57.5	68.8	72.7
>20 MW	19.3	96.4	209.7	228.7	230.3
Total Market	**31.0**	**154.9**	**394.7**	**469.5**	**486.9**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	25	125	238	168	166
Cumulative Avoided CO_2 Emissions, thousand MT	25	376	1,342	2,322	3,156
Average unit Emissions savings, lb/MWh	233.7	233.7	178.1	106.7	102.3
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	29	147	363	430	445
Cumulative Avoided CO_2 Emissions, thousand MT	29	440	1,823	3,841	6,036
Average unit Emissions savings, lb/MWh	273.4	273.4	271.6	273.7	273.6

Source: ICF International, Inc.

Table D-19: High Case SMUD Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	2	8	27	34	35
Commercial/Institutional	4	18	53	68	73
Residential	0	1	2	3	3
Cumulative Market Penetration, MW	5	26	82	105	112
Avoided Electric Cooling, MW	1	4	10	13	13
Scenario Grand Total	6	30	92	118	125
Annual Electric Energy (Million kWh)					
Industrial	11	57	195	245	254
Commercial/Institutional	20	102	297	376	402
Residential	1	4	14	19	20
Total	**33**	**164**	**506**	**640**	**676**
Avoided Cooling	2	10	27	34	36
Scenario Grand Total	35	174	534	674	713
CHP Fuel, (billion Btu/year)	327	1,637	4,954	6,208	6,550
Avoided Boiler Fuel (Billion Btu/year)	101	504	1,502	1,884	1,981
Incremental Onsite Fuel (billion Btu/year)	227	1,133	3,453	4,325	4,569
Cumulative Investment (million 2011 $)	$8	$42	$125	$160	$165
Cumulative Capital Incentives(Million 2011 $)	$1	$4	$16	$21	$22
Annual Electric Energy (Million 2011 $)					
Total	**$3.14**	**$15.70**	**$52.92**	**$72.75**	**$80.25**
Avoided Cooling	$0.26	$1.28	$3.70	$4.91	$5.38
Scenario Grand Total	$3.40	$16.98	$56.62	$77.66	$85.64
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$1.77	$8.86	$28.48	$41.02	$48.37
Avoided Boiler Fuel	$0.68	$3.42	$10.79	$15.22	$17.55
Total	**$1.09**	**$5.44**	**$17.69**	**$25.81**	**$30.82**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.3	1.7	7.8	12.4	14.0
500kW-1,000kW	0.4	1.9	7.0	9.7	10.4
1-5 MW	1.5	7.5	25.9	32.8	34.2
5-20 MW	2.2	11.0	33.1	40.5	42.9
>20 MW	0.8	4.2	8.7	9.7	10.1
Total Market	**5.2**	**26.2**	**82.4**	**105.1**	**111.5**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	3	14	23	-4	-4
Cumulative Avoided CO_2 Emissions, thousand MT	3	43	141	175	153
Average unit Emissions savings, lb/MWh	180.1	180.1	96.7	-14.1	-13.6
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	4	22	67	86	92
Cumulative Avoided CO_2 Emissions, thousand MT	4	65	309	702	1,150
Average unit Emissions savings, lb/MWh	273.2	273.2	276.7	282.8	283.4

Source: ICF International, Inc.

Table D-20: High Case Other North Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	8	42	116	139	146
Commercial/Institutional	1	6	19	25	27
Residential	0	0	0	0	0
Cumulative Market Penetration, MW	9	47	135	164	173
Avoided Electric Cooling, MW	0	1	3	4	5
Scenario Grand Total	10	48	138	168	177
Annual Electric Energy (Million kWh)					
Industrial	65	324	899	1076	1,131
Commercial/Institutional	7	34	108	142	153
Residential	0	0	1	2	2
Total	**72**	**358**	**1,009**	**1,220**	**1286**
Avoided Cooling	1	3	9	12	13
Scenario Grand Total	72	361	1,018	1,232	1,298
CHP Fuel, (billion Btu/year)	630	3,148	8,820	10,658	11,222
Avoided Boiler Fuel (Billion Btu/year)	204	1,019	2,793	3,382	3,555
Incremental Onsite Fuel (billion Btu/year)	426	2,129	6,027	7,276	7,667
Cumulative Investment (million 2011 $)	$12	$62	$168	$204	$206
Cumulative Capital Incentives(Million 2011 $)	$1	$4	$12	$16	$17
Annual Electric Energy (Million 2011 $)					
Total	**$5.59**	**$27.96**	**$86.24**	**$115.17**	**$129.05**
Avoided Cooling	$0.09	$0.47	$1.44	$2.00	$2.22
Scenario Grand Total	$5.69	$28.43	$87.68	$117.17	$131.27
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$3.38	$16.92	$50.35	$69.92	$82.30
Avoided Boiler Fuel	$1.32	$6.58	$19.06	$26.05	$30.15
Total	**$2.07**	**$10.34**	**$31.29**	**$43.86**	**$52.15**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.4	1.8	7.2	11.1	12.4
500kW-1,000kW	0.3	1.4	4.9	6.7	7.3
1-5 MW	1.0	5.2	17.5	22.0	22.9
5-20 MW	2.4	11.8	32.0	37.9	39.4
>20 MW	5.4	27.1	73.0	86.0	90.9
Total Market	**9.5**	**47.4**	**134.6**	**163.7**	**172.7**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	9	43	103	95	100
Cumulative Avoided CO_2 Emissions, thousand MT	9	130	524	1,013	1,501
Average unit Emissions savings, lb/MWh	264.3	264.3	222.4	169.2	169.3
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	10	49	139	170	179
Cumulative Avoided CO_2 Emissions, thousand MT	10	148	664	1,451	2,329
Average unit Emissions savings, lb/MWh	301.8	301.8	301.0	304.1	304.4

Source: ICF International, Inc.

Table D-21: High Case Other South Summary Output

CHP Measurement	2011	2015	2020	2025	2030
Cumulative Market Penetration (MW)					
Industrial	3	17	53	67	70
Commercial/Institutional	3	14	44	57	61
Residential	0	0	0	0	0
Cumulative Market Penetration, MW	6	31	98	124	131
Avoided Electric Cooling, MW	1	3	8	10	11
Scenario Grand Total	7	34	106	135	142
Annual Electric Energy (Million kWh)					
Industrial	24	121	384	483	501
Commercial/Institutional	19	94	287	368	393
Residential	0	0	0	0	0
Total	**43**	**215**	**671**	**851**	**894**
Avoided Cooling	2	9	25	32	34
Scenario Grand Total	45	224	697	883	927
CHP Fuel, (billion Btu/year)	438	2,190	6,646	8,346	8,749
Avoided Boiler Fuel (Billion Btu/year)	153	764	2,234	2,815	2,945
Incremental Onsite Fuel (billion Btu/year)	285	1,426	4,411	5,531	5,804
Cumulative Investment (million 2011 $)	$10	$49	$143	$183	$187
Cumulative Capital Incentives(Million 2011 $)	$1	$7	$23	$30	$32
Annual Electric Energy (Million 2011 $)					
Total	**$4.56**	**$22.79**	**$77.34**	**$105.68**	**$115.22**
Avoided Cooling	$0.27	$1.37	$4.03	$5.41	$5.94
Scenario Grand Total	$4.83	$24.16	$81.37	$111.09	$121.16
Incremental Onsite Fuel (million 2011 $)					
CHP Fuel	$2.58	$12.92	$41.56	$59.46	$69.20
Avoided Boiler Fuel	$1.05	$5.23	$16.18	$22.94	$26.33
Total	**$1.54**	**$7.69**	**$25.39**	**$36.52**	**$42.86**
Cumulative Market Penetration by Size and Year, MW					
50-500 kW	0.7	3.4	13.6	20.7	22.6
500kW-1,000kW	0.5	2.4	8.6	11.8	12.4
1-5 MW	1.9	9.6	32.3	40.4	41.9
5-20 MW	3.1	15.5	43.0	51.6	53.9
>20 MW	0.0	0.0	0.0	0.0	0.0
Total Market	**6.2**	**30.9**	**97.6**	**124.5**	**130.9**
Avoided CO_2 Emissions, Annual basis compared to RPS/C&T, thousand MT	4	20	34	-1	-1
Cumulative Avoided CO_2 Emissions, thousand MT	4	60	203	267	261
Average unit Emissions savings, lb/MWh	197.1	197.1	108.8	-3.7	-2.7
Avoided CO_2 Emissions compared to no policy case, Annual basis, thousand MT	6	30	93	121	128
Cumulative Avoided CO_2 Emissions, thousand MT	6	89	428	978	1,603
Average unit Emissions savings, lb/MWh	292.1	292.1	295.0	302.7	303.3

Source: ICF International, Inc.

Area: CS - INFORMATION
Witness: Ann D. Ayres

Summary of Shared Services Workpapers:

	In 2013 $ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
Description	**2013**	**2014**	**2015**	**2016**
A. Energy Markets & Capacity Products	2,647	2,764	2,860	2,956
B. VP Customer Solutions	265	442	442	442
Total	**2,912**	**3,206**	**3,302**	**3,398**

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Cost Center: VARIOUS

Summary for Category: A. Energy Markets & Capacity Products

	In 2013$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	2,516	2,551	2,647	2,743
Non-Labor	130	212	212	212
NSE	0	0	0	0
Total	**2,646**	**2,763**	**2,859**	**2,955**
FTE	25.4	24.9	25.7	26.9

Cost Centers belonging to this Category:

2200-0246.000 Energy Markets & Capacity Products - Director

Labor	266	227	227	227
Non-Labor	72	71	71	71
NSE	0	0	0	0
Total	**338**	**298**	**298**	**298**
FTE	2.4	2.0	2.0	2.0

2200-0328.000 Capacity Products Support

Labor	624	710	710	710
Non-Labor	15	26	26	26
NSE	0	0	0	0
Total	**639**	**736**	**736**	**736**
FTE	5.7	6.4	6.4	6.4

2200-0330.000 Capacity Products Staff

Labor	516	539	539	539
Non-Labor	23	57	57	57
NSE	0	0	0	0
Total	**539**	**596**	**596**	**596**
FTE	4.6	4.8	4.8	4.8

2200-2158.000 Gas Scheduling

Labor	543	506	602	698
Non-Labor	11	28	28	28
NSE	0	0	0	0
Total	**554**	**534**	**630**	**726**
FTE	5.7	5.4	6.2	7.4

2200-2329.000 Gas Transmission Planning

Labor	567	569	569	569
Non-Labor	9	30	30	30
NSE	0	0	0	0
Total	**576**	**599**	**599**	**599**
FTE	7.0	6.3	6.3	6.3

Note: Totals may include rounding differences.

Beginning of Workpaper
2200-0246.000 - Energy Markets & Capacity Products - Director

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub 1. Energy Markets & Capacity Products - Director
Cost Center: 2200-0246.000 - Energy Markets & Capacity Products - Director

Activity Description:

The Director of Energy Markets & Capacity Products oversees both shared and nonshared activities residing in the Energy Markets and Capacity Products organization. This organization is responsible for account management of SoCalGas' largest customers including electric generation and wholesales customers (not a shared service), and provides staff support for both SoCalGas and SDG&E on customer and policy issues related to activities in capacity products, storage products, capacity products support and energy markets staff support, gas scheduling, gas transmission planning and service to electric generation customers.

Forecast Explanations:

Labor - 5-YR Average

Labor costs in this shared cost center were relatively flat for the recorded 5-years period, reflect historical costs for 2 FTEs, and are expected to continue at this level to TY2016. For consistency with the Energy Markets and Capacity Products organization, as well as for consistency with all other Customer Service - Information areas, 5-years average forecast methodology is used as the basis for TY2016 forecast with no incremental adjustments.

Non-Labor - 5-YR Average

5-year average forecasting methodology is selected to reflect continual non-labor core business functions and periodic expenses. For consistency with the Energy Markets & Capacity Products forecast methodology, as well as for consistency with all other Customer Service - Information areas, 5-years average is used as the basis for this area's non-labor TY2016 forecast with no incremental adjustments.

NSE - 5-YR Average

Not applicable.

Summary of Results:

	In 2013$ (000) Incurred Costs							
	Adjusted-Recorded					Adjusted-Forecast		
Years	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labor	233	194	219	225	266	227	227	227
Non-Labor	81	78	64	62	72	71	71	71
NSE	0	0	0	0	0	0	0	0
Total	**314**	**272**	**283**	**286**	**338**	**299**	**299**	**299**
FTE	1.9	1.6	2.1	2.1	2.4	2.0	2.0	2.0

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 1. Energy Markets & Capacity Products - Director
Cost Center: 2200-0246.000 - Energy Markets & Capacity Products - Director

Cost Center Allocations (Incurred Costs):

	2013 Adjusted-Recorded					2014 Adjusted-Forecast				
	Labor	**Non-Labor**	**NSE**	**Total**	**FTE**	**Labor**	**Non-Labor**	**NSE**	**Total**	**FTE**
Directly Retained	0	0	0	0	0.00	0	7	0	7	0.00
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	266	72	0	338	2.38	227	64	0	291	2.01
Total Incurred	**266**	**72**	**0**	**338**	**2.38**	**227**	**71**	**0**	**298**	**2.01**
% Allocation										
Retained	93.00%	93.00%				93.00%	93.00%			
SEU	7.00%	7.00%				7.00%	7.00%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

	2015 Adjusted-Forecast					2016 Adjusted-Forecast				
	Labor	**Non-Labor**	**NSE**	**Total**	**FTE**	**Labor**	**Non-Labor**	**NSE**	**Total**	**FTE**
Directly Retained	0	7	0	7	0.00	0	7	0	7	0.00
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	227	64	0	291	2.01	227	64	0	291	2.01
Total Incurred	**227**	**71**	**0**	**298**	**2.01**	**227**	**71**	**0**	**298**	**2.01**
% Allocation										
Retained	93.00%	93.00%				93.00%	93.00%			
SEU	7.00%	7.00%				7.00%	7.00%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

Note: Totals may include rounding differences.

Area:	CS - INFORMATION
Witness:	Ann D. Ayres
Category:	A. Energy Markets & Capacity Products
Category-Sub:	1. Energy Markets & Capacity Products - Director
Cost Center:	2200-0246.000 - Energy Markets & Capacity Products - Director

Cost Center Allocation Percentage Drivers/Methodology:

Cost Center Allocation Percentage for 2013

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2014

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2015

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2016

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 1. Energy Markets & Capacity Products - Director
Cost Center: 2200-0246.000 - Energy Markets & Capacity Products - Director

Forecast Summary:

In 2013 $(000) Incurred Costs										
Forecast Method		**Base Forecast**			**Forecast Adjustments**			**Adjusted-Forecast**		
Years		**2014**	**2015**	**2016**	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Labor	5-YR Average	227	227	227	0	0	0	227	227	227
Non-Labor	5-YR Average	71	71	71	0	0	0	71	71	71
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		**299**	**299**	**299**	**0**	**0**	**0**	**299**	**299**	**299**
FTE	5-YR Average	2.0	2.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0

Forecast Adjustment Details:

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2014 Total	**0**	**0**	**0**	**0**	**0.0**	
2015 Total	**0**	**0**	**0**	**0**	**0.0**	
2016 Total	**0**	**0**	**0**	**0**	**0.0**	

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 1. Energy Markets & Capacity Products - Director
Cost Center: 2200-0246.000 - Energy Markets & Capacity Products - Director

Determination of Adjusted-Recorded (Incurred Costs):

	2009 ($000)	2010 ($000)	2011 ($000)	2012 ($000)	2013 ($000)
Recorded (Nominal $)*					
Labor	179	154	180	189	228
Non-Labor	54	73	61	60	72
NSE	0	0	0	0	0
Total	**233**	**227**	**241**	**250**	**300**
FTE	1.6	1.4	1.8	1.8	2.0
Adjustments (Nominal $) **					
Labor	0	0	0	0	0
Non-Labor	20	0	0	0	0
NSE	0	0	0	0	0
Total	**20**	**0**	**0**	**0**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal $)					
Labor	179	154	180	189	228
Non-Labor	74	73	61	60	72
NSE	0	0	0	0	0
Total	**253**	**227**	**241**	**250**	**300**
FTE	1.6	1.4	1.8	1.8	2.0
Vacation & Sick (Nominal $)					
Labor	32	27	30	30	38
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**32**	**27**	**30**	**30**	**38**
FTE	0.3	0.2	0.3	0.3	0.3
Escalation to 2013$					
Labor	21	13	9	5	0
Non-Labor	7	5	3	1	0
NSE	0	0	0	0	0
Total	**28**	**18**	**12**	**6**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2013$)					
Labor	233	194	219	225	266
Non-Labor	81	78	64	62	72
NSE	0	0	0	0	0
Total	**314**	**272**	**283**	**286**	**338**
FTE	1.9	1.6	2.1	2.1	2.3

* After company-wide exclusions of Non-GRC costs
** Refer to "Detail of Adjustments to Recorded" page for line item adjustments
Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 1. Energy Markets & Capacity Products - Director
Cost Center: 2200-0246.000 - Energy Markets & Capacity Products - Director

Summary of Adjustments to Recorded:

In Nominal $ (000) Incurred Costs					
Years	**2009**	**2010**	**2011**	**2012**	**2013**
Labor	0	0	0	0	0
Non-Labor	20	0	0	0	0
NSE	0	0	0	0	0
Total	**20**	**0**	**0**	**0**	**0**
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2009	0	20	0	0.0	CCTR Transf	From 2200-0248.000	CMAK201311010 05123917
Cost alignment adjustment - Transfer Customer Recognition non-labor expenses from CC 2200-0248 to CC 2200-0246 (Workpaper 2IN003.000 to Workpaper 2200-0246.000)							
2009 Total	**0**	**20**	**0**	**0.0**			
2010 Total	**0**	**0**	**0**	**0.0**			
2011 Total	**0**	**0**	**0**	**0.0**			
2012 Total	**0**	**0**	**0**	**0.0**			
2013 Total	**0**	**0**	**0**	**0.0**			

Note: Totals may include rounding differences.

Beginning of Workpaper
2200-0328.000 - Capacity Products Support

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub 2. Capacity Products Support
Cost Center: 2200-0328.000 - Capacity Products Support

Activity Description:

This is one of five shared services cost centers within the Energy Markets and Capacity Products organization.This organization is responsible for account management of SoCalGas' largest customers including electric generation and wholesales customers (not a shared service), and provides staff support for both SoCalGas and SDG&E on customer and policy issues related to activities in capacity products, storage products, capacity products support and energy markets staff support, gas scheduling, gas transmission planning and service to electric generation customers.

Capacity Products Support is responsible for the development and administration of pipeline capacity products that provide SDG&E and SoCalGas customers access to natural gas supply from interconnecting upstream pipelines, California gas production, underground storage, and SDG&E and SoCalGas Citygate.

Forecast Explanations:

Labor - 5-YR Average

Labor costs in this organization were relatively flat for the recorded 5-years period. 5-year average forecasting methodology is used as the basis for TY2016 forecast to reflect continual support of core business functions and activities as well as for consistency with all other Customer Service - Information areas, with additional forecast adjustments to account for specific program growth above historical levels.

Non-Labor - 5-YR Average

5-year average forecasting methodology is selected to reflect continual non-labor core business functions and periodic expenses. For consistency with the Energy Markets & Capacity Products forecast methodology, as well as for consistency with all other Customer Service - Information areas, 5-years average is used as the basis for this area's non-labor TY2016 forecast with no incremental adjustments.

NSE - 5-YR Average

Not applicable.

Summary of Results:

	In 2013$ (000) Incurred Costs							
	Adjusted-Recorded					Adjusted-Forecast		
Years	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labor	632	663	553	534	624	710	710	710
Non-Labor	17	12	63	22	15	26	26	26
NSE	0	0	0	0	0	0	0	0
Total	**649**	**674**	**616**	**556**	**640**	**736**	**736**	**736**
FTE	5.4	5.9	5.0	4.8	5.7	6.4	6.4	6.4

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 2. Capacity Products Support
Cost Center: 2200-0328.000 - Capacity Products Support

Cost Center Allocations (Incurred Costs):

	2013 Adjusted-Recorded					2014 Adjusted-Forecast				
	Labor	**Non-Labor**	**NSE**	**Total**	**FTE**	**Labor**	**Non-Labor**	**NSE**	**Total**	**FTE**
Directly Retained	0	0	0	0	-0.03	0	12	0	12	-0.03
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	624	15	0	639	5.77	710	14	0	724	6.38
Total Incurred	**624**	**15**	**0**	**639**	**5.74**	**710**	**26**	**0**	**736**	**6.35**
% Allocation										
Retained	93.00%	93.00%				93.00%	93.00%			
SEU	7.00%	7.00%				7.00%	7.00%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

	2015 Adjusted-Forecast					2016 Adjusted-Forecast				
	Labor	**Non-Labor**	**NSE**	**Total**	**FTE**	**Labor**	**Non-Labor**	**NSE**	**Total**	**FTE**
Directly Retained	0	12	0	12	-0.03	0	12	0	12	-0.03
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	710	14	0	724	6.38	710	14	0	724	6.38
Total Incurred	**710**	**26**	**0**	**736**	**6.35**	**710**	**26**	**0**	**736**	**6.35**
% Allocation										
Retained	93.00%	93.00%				93.00%	93.00%			
SEU	7.00%	7.00%				7.00%	7.00%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 2. Capacity Products Support
Cost Center: 2200-0328.000 - Capacity Products Support

Cost Center Allocation Percentage Drivers/Methodology:

Cost Center Allocation Percentage for 2013

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2014

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2015

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2016

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 2. Capacity Products Support
Cost Center: 2200-0328.000 - Capacity Products Support

Forecast Summary:

In 2013 $(000) Incurred Costs										
Forecast Method		**Base Forecast**			**Forecast Adjustments**			**Adjusted-Forecast**		
Years		**2014**	**2015**	**2016**	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Labor	5-YR Average	601	601	601	109	109	109	710	710	710
Non-Labor	5-YR Average	26	26	26	0	0	0	26	26	26
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		**627**	**627**	**627**	**109**	**109**	**109**	**736**	**736**	**736**
FTE	5-YR Average	5.4	5.4	5.4	1.0	1.0	1.0	6.4	6.4	6.4

Forecast Adjustment Details:

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2014	109	0	0	109	1.0	1-Sided Adj
Incremental labor and FTE costs for 1 Advisor to support expanded Capacity Products Support.						
2014 Total	**109**	**0**	**0**	**109**	**1.0**	
2015	109	0	0	109	1.0	1-Sided Adj
Incremental labor and FTE costs for 1 Advisor to support expanded Capacity Products Support.						
2015 Total	**109**	**0**	**0**	**109**	**1.0**	
2016	109	0	0	109	1.0	1-Sided Adj
Incremental labor and FTE costs for 1 Advisor to support expanded Capacity Products Support.						
2016 Total	**109**	**0**	**0**	**109**	**1.0**	

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 2. Capacity Products Support
Cost Center: 2200-0328.000 - Capacity Products Support

Determination of Adjusted-Recorded (Incurred Costs):

	2009 ($000)	2010 ($000)	2011 ($000)	2012 ($000)	2013 ($000)
Recorded (Nominal $)*					
Labor	213	456	462	456	543
Non-Labor	15	11	60	21	15
NSE	0	0	0	0	0
Total	**228**	**466**	**522**	**478**	**558**
FTE	2.1	4.4	4.4	4.2	5.0
Adjustments (Nominal $) **					
Labor	274	70	-7	-6	-7
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**274**	**70**	**-7**	**-6**	**-7**
FTE	2.4	0.6	-0.1	-0.1	-0.1
Recorded-Adjusted (Nominal $)					
Labor	487	526	454	450	535
Non-Labor	15	11	60	21	15
NSE	0	0	0	0	0
Total	**502**	**537**	**515**	**472**	**551**
FTE	4.5	5.0	4.3	4.1	4.9
Vacation & Sick (Nominal $)					
Labor	88	92	75	72	89
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**88**	**92**	**75**	**72**	**89**
FTE	0.9	0.9	0.7	0.7	0.8
Escalation to 2013$					
Labor	57	45	24	12	0
Non-Labor	1	1	3	0	0
NSE	0	0	0	0	0
Total	**58**	**46**	**26**	**12**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2013$)					
Labor	632	663	553	534	624
Non-Labor	17	12	63	22	15
NSE	0	0	0	0	0
Total	**649**	**674**	**616**	**556**	**640**
FTE	5.4	5.9	5.0	4.8	5.7

* After company-wide exclusions of Non-GRC costs
** Refer to "Detail of Adjustments to Recorded" page for line item adjustments
Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 2. Capacity Products Support
Cost Center: 2200-0328.000 - Capacity Products Support

Summary of Adjustments to Recorded:

In Nominal $ (000) Incurred Costs					
Years	**2009**	**2010**	**2011**	**2012**	**2013**
Labor	274	70	-7	-6	-7
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**274**	**70**	**-7**	**-6**	**-7**
FTE	2.4	0.6	-0.1	-0.1	-0.1

Detail of Adjustments to Recorded:

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2009	114	0	0	1.0	CCTR Transf	From 2200-0249.000	CMAK201311010 93123157
Cost alignment adjustment - Transfer capacity products support labor and FTE costs for 1 manager from CC 2200-0249 to CC 2200-0328 due to reorganization (Workpaper 2IN003.000 to Workpaper 2200-0328.000)							
2009	160	0	0	1.4	CCTR Transf	From 2200-0327.000	CMAK201311011 03128523
Cost alignment adjustment - Transfer capacity products support labor and FTE costs for 2 advisors from CC 2200-0327 to CC 2200-0328 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2200-0238.000)							
2009 Total	**274**	**0**	**0**	**2.4**			
2010	31	0	0	0.3	CCTR Transf	From 2200-0249.000	CMAK201311011 04710070
Cost alignment adjustment - Transfer capacity products support labor and FTE costs for 1 manager from CC 2200-0249 to CC 2200-0328 due to reorganization (Workpaper 2IN003.000 to Workpaper 2200-0328.000)							
2010	45	0	0	0.4	CCTR Transf	From 2200-0327.000	CMAK201311011 10149413
Cost alignment adjustment - Transfer capacity products support labor and FTE costs for 2 advisors from CC 2200-0327 to CC 2200-0328 due to reorganization. (Workpaper 2IN003.000 to Workpaper 2200-0238.000)							
2010	-5	0	0	-0.1	1-Sided Adj	N/A	CMAK201311020 10335423
One-sided adjustment - Cost exclusion to remove labor and FTE costs for Montebello storage expenses not supported by GRC.							

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 2. Capacity Products Support
Cost Center: 2200-0328.000 - Capacity Products Support

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2010 Total	**70**	**0**	**0**	**0.6**			
2011	-7	0	0	-0.1	1-Sided Adj	N/A	CMAK201311020 10426640
One-sided adjustment - Cost exclusion to remove labor and FTE costs for Montebello storage expenses not supported by GRC.							
2011 Total	**-7**	**0**	**0**	**-0.1**			
2012	-6	0	0	-0.1	1-Sided Adj	N/A	CMAK201311020 10523153
One-sided adjustment - Cost exclusion to remove labor and FTE costs for Montebello storage expenses not supported by GRC.							
2012 Total	**-6**	**0**	**0**	**-0.1**			
2013	-7	0	0	-0.1	1-Sided Adj	N/A	CMAK201402191 45621893
One-sided adjustment - Cost exclusion to remove labor and FTE costs for Montebello storage expenses not supported by GRC.							
2013 Total	**-7**	**0**	**0**	**-0.1**			

Note: Totals may include rounding differences.

Beginning of Workpaper
2200-0330.000 - Capacity Products Staff

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub 3. Capacity Planning
Cost Center: 2200-0330.000 - Capacity Products Staff

Activity Description:

This is one of five shared services cost centers within the Energy Markets and Capacity Products organization.This organization is responsible for account management of SoCalGas' largest customers including electric generation and wholesales customers (not a shared service), and provides staff support for both SoCalGas and SDG&E on customer and policy issues related to activities in capacity products, storage products, capacity products support and energy markets staff support, gas scheduling, gas transmission planning and service to electric generation customers.

Capacity Products Staff is responsible for monitoring and analyzing market and pricing information, recommending changes to capacity and storage market activities in response to market developments, developing pricing guidelines for storage and hub products offered via the California Energy Hub, and monitoring the financial performance of California Energy Hub product offerings.

Forecast Explanations:

Labor - 5-YR Average

Labor costs in this organization were relatively flat for the recorded 5-years period. For consistency with the Energy Markets and Capacity Products organization, as well as for consistency with all other Customer Service - Information areas, 5-years average forecast methodology is used as the basis for TY2016 forecast with no incremental adjustments.

Non-Labor - 5-YR Average

5-year average forecasting methodology is selected to reflect continual non-labor core business functions and periodic expenses. For consistency with the Energy Markets & Capacity Products forecast methodology, as well as for consistency with all other Customer Service - Information areas, 5-years average is used as the basis for this area's non-labor TY2016 forecast with no incremental adjustments.

NSE - 5-YR Average

Not applicable.

Summary of Results:

	In 2013$ (000) Incurred Costs							
	Adjusted-Recorded					Adjusted-Forecast		
Years	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labor	498	567	557	554	516	539	539	539
Non-Labor	70	75	75	41	23	57	57	57
NSE	0	0	0	0	0	0	0	0
Total	**568**	**641**	**633**	**595**	**540**	**595**	**595**	**595**
FTE	4.3	5.1	5.0	5.0	4.6	4.8	4.8	4.8

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 3. Capacity Planning
Cost Center: 2200-0330.000 - Capacity Products Staff

Cost Center Allocations (Incurred Costs):

	2013 Adjusted-Recorded					2014 Adjusted-Forecast				
	Labor	**Non-Labor**	**NSE**	**Total**	**FTE**	**Labor**	**Non-Labor**	**NSE**	**Total**	**FTE**
Directly Retained	0	0	0	0	0.00	0	0	0	0	0.00
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	516	23	0	539	4.55	539	57	0	596	4.80
Total Incurred	**516**	**23**	**0**	**539**	**4.55**	**539**	**57**	**0**	**596**	**4.80**
% Allocation										
Retained	93.00%	93.00%				93.00%	93.00%			
SEU	7.00%	7.00%				7.00%	7.00%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

	2015 Adjusted-Forecast					2016 Adjusted-Forecast				
	Labor	**Non-Labor**	**NSE**	**Total**	**FTE**	**Labor**	**Non-Labor**	**NSE**	**Total**	**FTE**
Directly Retained	0	0	0	0	0.00	0	0	0	0	0.00
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	539	57	0	596	4.80	539	57	0	596	4.80
Total Incurred	**539**	**57**	**0**	**596**	**4.80**	**539**	**57**	**0**	**596**	**4.80**
% Allocation										
Retained	93.00%	93.00%				93.00%	93.00%			
SEU	7.00%	7.00%				7.00%	7.00%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 3. Capacity Planning
Cost Center: 2200-0330.000 - Capacity Products Staff

Cost Center Allocation Percentage Drivers/Methodology:

Cost Center Allocation Percentage for 2013

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2014

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2015

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2016

The allocation % is estimated proportionally using gas throughput for each utility. The relative gas throughput is the best available proxy of resource allocation for providing policy and customer support between SCG and SDG&E in this cost center.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 3. Capacity Planning
Cost Center: 2200-0330.000 - Capacity Products Staff

Forecast Summary:

In 2013 $(000) Incurred Costs										
Forecast Method		**Base Forecast**			**Forecast Adjustments**			**Adjusted-Forecast**		
Years		**2014**	**2015**	**2016**	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Labor	5-YR Average	539	539	539	0	0	0	539	539	539
Non-Labor	5-YR Average	57	57	57	0	0	0	57	57	57
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		**595**	**595**	**595**	**0**	**0**	**0**	**595**	**595**	**595**
FTE	5-YR Average	4.8	4.8	4.8	0.0	0.0	0.0	4.8	4.8	4.8

Forecast Adjustment Details:

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2014 Total	**0**	**0**	**0**	**0**	**0.0**	
2015 Total	**0**	**0**	**0**	**0**	**0.0**	
2016 Total	**0**	**0**	**0**	**0**	**0.0**	

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 3. Capacity Planning
Cost Center: 2200-0330.000 - Capacity Products Staff

Determination of Adjusted-Recorded (Incurred Costs):

	2009 ($000)	2010 ($000)	2011 ($000)	2012 ($000)	2013 ($000)
Recorded (Nominal $)*					
Labor	384	449	457	467	443
Non-Labor	63	69	72	40	23
NSE	0	0	0	0	0
Total	**448**	**519**	**530**	**507**	**466**
FTE	3.6	4.3	4.3	4.3	3.9
Adjustments (Nominal $) **					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal $)					
Labor	384	449	457	467	443
Non-Labor	63	69	72	40	23
NSE	0	0	0	0	0
Total	**448**	**519**	**530**	**507**	**466**
FTE	3.6	4.3	4.3	4.3	3.9
Vacation & Sick (Nominal $)					
Labor	69	79	76	75	74
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**69**	**79**	**76**	**75**	**74**
FTE	0.7	0.8	0.7	0.7	0.7
Escalation to 2013$					
Labor	45	39	24	12	0
Non-Labor	6	5	3	1	0
NSE	0	0	0	0	0
Total	**51**	**44**	**27**	**13**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2013$)					
Labor	498	567	557	554	516
Non-Labor	70	75	75	41	23
NSE	0	0	0	0	0
Total	**568**	**641**	**633**	**595**	**540**
FTE	4.3	5.1	5.0	5.0	4.6

* After company-wide exclusions of Non-GRC costs
** Refer to "Detail of Adjustments to Recorded" page for line item adjustments
Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 3. Capacity Planning
Cost Center: 2200-0330.000 - Capacity Products Staff

Summary of Adjustments to Recorded:

In Nominal $ (000) Incurred Costs					
Years	**2009**	**2010**	**2011**	**2012**	**2013**
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year/Expl.	Labor	NLbr	NSE	FTE	Adj_Type	From CCtr	RefID
2009 Total	**0**	**0**	**0**	**0.0**			
2010 Total	**0**	**0**	**0**	**0.0**			
2011 Total	**0**	**0**	**0**	**0.0**			
2012 Total	**0**	**0**	**0**	**0.0**			
2013 Total	**0**	**0**	**0**	**0.0**			

Note: Totals may include rounding differences.

Beginning of Workpaper
2200-2158.000 - Gas Scheduling

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub 4. Gas Scheduling
Cost Center: 2200-2158.000 - Gas Scheduling

Activity Description:

This is one of five shared services cost centers within the Energy Markets and Capacity Products organization.This organization is responsible for account management of SoCalGas' largest customers including electric generation and wholesales customers (not a shared service), and provides staff support for both SoCalGas and SDG&E on customer and policy issues related to activities in capacity products, storage products, capacity products support and energy markets staff support, gas scheduling, gas transmission planning and service to electric generation customers.

Gas Scheduling is responsible for managing the gas industry standard process of scheduling gas into the transmission pipeline system. Responsibilities include maximizing system capacity by balancing the system between in-state and out-of-state scheduled receipts and forecasted system demand, declaring operational flow orders and winter balancing enforcement. The organization is also responsible for managing transportation nominations based on priority rights to receipt capacities, confirming nominations to interstate and intrastate pipelines, reporting scheduling volumes to customers, tracking storage accounts and the imbalance trading process for customer owned gas supplies. The staff is also responsible for making regular postings to SoCalGas Envoy (electronic bulletin board system) regarding gas system conditions. These postings provide for communication, in a consistent manner, with the gas marketplace.

Forecast Explanations:

Labor - 5-YR Average

Labor costs in this organization were relatively flat for the recorded 5-years period. 5-year average forecasting methodology is used as the basis for TY2016 forecast to reflect continual support of core business functions and activities as well as for consistency with all other Customer Service - Information areas, with additional forecast adjustments to account for new activities above historic levels in compliance with new regulations (such as the FERC electric & gas harmonization rulemaking).

Non-Labor - 5-YR Average

5-year average forecasting methodology is selected to reflect continual non-labor core business functions and periodic expenses. For consistency with the Energy Markets & Capacity Products forecast methodology, as well as for consistency with all other Customer Service - Information areas, 5-years average is used as the basis for this area's non-labor TY2016 forecast with no incremental adjustments.

NSE - 5-YR Average

Not applicable.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub 4. Gas Scheduling
Cost Center: 2200-2158.000 - Gas Scheduling

Summary of Results:

	In 2013$ (000) Incurred Costs							
	Adjusted-Recorded					Adjusted-Forecast		
Years	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labor	493	529	472	493	543	506	602	698
Non-Labor	51	32	30	18	11	28	28	28
NSE	0	0	0	0	0	0	0	0
Total	**543**	**561**	**502**	**511**	**554**	**534**	**630**	**726**
FTE	5.3	5.8	5.1	5.1	5.7	5.4	6.2	7.4

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 4. Gas Scheduling
Cost Center: 2200-2158.000 - Gas Scheduling

Cost Center Allocations (Incurred Costs):

	2013 Adjusted-Recorded					2014 Adjusted-Forecast				
	Labor	**Non-Labor**	**NSE**	**Total**	**FTE**	**Labor**	**Non-Labor**	**NSE**	**Total**	**FTE**
Directly Retained	0	0	0	0	0.00	0	0	0	0	0.00
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	543	11	0	554	5.67	506	28	0	534	5.39
Total Incurred	**543**	**11**	**0**	**554**	**5.67**	**506**	**28**	**0**	**534**	**5.39**
% Allocation										
Retained	88.00%	88.00%				88.00%	88.00%			
SEU	12.00%	12.00%				12.00%	12.00%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

	2015 Adjusted-Forecast					2016 Adjusted-Forecast				
	Labor	**Non-Labor**	**NSE**	**Total**	**FTE**	**Labor**	**Non-Labor**	**NSE**	**Total**	**FTE**
Directly Retained	0	0	0	0	0.00	0	0	0	0	0.00
Directly Allocated	0	0	0	0	0.00	192	0	0	192	2.00
Subj. To % Alloc.	602	28	0	630	6.19	506	28	0	534	5.39
Total Incurred	**602**	**28**	**0**	**630**	**6.19**	**698**	**28**	**0**	**726**	**7.39**
% Allocation										
Retained	88.00%	88.00%				88.00%	88.00%			
SEU	12.00%	12.00%				12.00%	12.00%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 4. Gas Scheduling
Cost Center: 2200-2158.000 - Gas Scheduling

Cost Center Allocation Percentage Drivers/Methodology:

Cost Center Allocation Percentage for 2013

The allocation % is estimated proportionally using three year weighted average cost of gas for each utility. The relative gas cost is the best available proxy of resource allocation for providing gas scheduling support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2014

The allocation % is estimated proportionally using three year weighted average cost of gas for each utility. The relative gas cost is the best available proxy of resource allocation for providing gas scheduling support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2015

The allocation % is estimated proportionally using three year weighted average cost of gas for each utility. The relative gas cost is the best available proxy of resource allocation for providing gas scheduling support between SCG and SDG&E in this cost center.

Cost Center Allocation Percentage for 2016

The allocation % is estimated proportionally using three year weighted average cost of gas for each utility. The relative gas cost is the best available proxy of resource allocation for providing gas scheduling support between SCG and SDG&E in this cost center.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 4. Gas Scheduling
Cost Center: 2200-2158.000 - Gas Scheduling

Forecast Summary:

In 2013 $(000) Incurred Costs										
Forecast Method		**Base Forecast**			**Forecast Adjustments**			**Adjusted-Forecast**		
Years		**2014**	**2015**	**2016**	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Labor	5-YR Average	506	506	506	0	96	192	506	602	698
Non-Labor	5-YR Average	28	28	28	0	0	0	28	28	28
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		**534**	**534**	**534**	**0**	**96**	**192**	**534**	**630**	**726**
FTE	5-YR Average	5.4	5.4	5.4	0.0	0.8	2.0	5.4	6.2	7.4

Forecast Adjustment Details:

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2014 Total	**0**	**0**	**0**	**0**	**0.0**	
2015	96	0	0	96	0.8	1-Sided Adj

Incremental gas scheduling advisor - labor and FTE to support new business functions related to Envoy Next Generation, Envoy and MCS Database, California Producers Envoy, Low OFO/EFO and Gas and Electric Harmonization systems.

2015 Total	**96**	**0**	**0**	**96**	**0.8**	
2016	192	0	0	192	2.0	1-Sided Adj

2 Incremental gas scheduling advisors - labor and FTE to support new business functions related to Envoy Next Generation, Envoy and MCS Database, California Producers Envoy, Low OFO/EFO and Gas and Electric Harmonization systems.

2016 Total	**192**	**0**	**0**	**192**	**2.0**	

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 4. Gas Scheduling
Cost Center: 2200-2158.000 - Gas Scheduling

Determination of Adjusted-Recorded (Incurred Costs):

	2009 ($000)	2010 ($000)	2011 ($000)	2012 ($000)	2013 ($000)
Recorded (Nominal $)*					
Labor	380	419	388	416	465
Non-Labor	46	30	29	18	11
NSE	0	0	0	0	0
Total	**426**	**449**	**416**	**434**	**476**
FTE	4.5	4.9	4.3	4.4	4.9
Adjustments (Nominal $) **					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal $)					
Labor	380	419	388	416	465
Non-Labor	46	30	29	18	11
NSE	0	0	0	0	0
Total	**426**	**449**	**416**	**434**	**476**
FTE	4.5	4.9	4.3	4.4	4.9
Vacation & Sick (Nominal $)					
Labor	69	73	64	67	77
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**69**	**73**	**64**	**67**	**77**
FTE	0.8	0.9	0.7	0.7	0.8
Escalation to 2013$					
Labor	44	36	20	11	0
Non-Labor	5	2	1	0	0
NSE	0	0	0	0	0
Total	**49**	**38**	**21**	**11**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2013$)					
Labor	493	529	472	493	543
Non-Labor	51	32	30	18	11
NSE	0	0	0	0	0
Total	**543**	**561**	**502**	**511**	**554**
FTE	5.3	5.8	5.0	5.1	5.7

* After company-wide exclusions of Non-GRC costs
** Refer to "Detail of Adjustments to Recorded" page for line item adjustments
Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 4. Gas Scheduling
Cost Center: 2200-2158.000 - Gas Scheduling

Summary of Adjustments to Recorded:

In Nominal $ (000) Incurred Costs					
Years	**2009**	**2010**	**2011**	**2012**	**2013**
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year/Expl.	Labor	NLbr	NSE	FTE	Adj_Type	From CCtr	RefID
2009 Total	**0**	**0**	**0**	**0.0**			
2010 Total	**0**	**0**	**0**	**0.0**			
2011 Total	**0**	**0**	**0**	**0.0**			
2012 Total	**0**	**0**	**0**	**0.0**			
2013 Total	**0**	**0**	**0**	**0.0**			

Note: Totals may include rounding differences.

Supplemental Workpapers for Workpaper 2200-2158.000

Supplemental Workpapers for Workpaper 2200-2158

Footnote No. 140

Sustainable FERC Project

FERC Takes Three Actions to Harmonize Gas and Electric Coordination

FERC Takes Three Actions to Harmonize Gas and Electric Cc

FERC today took several steps to address the growing interdependence between natural gas and electricity Citing the Southwest Cold Weather Event in 2011 and the Polar Vortex and sustained cold weather this past winter, FERC issued a Notice of Proposed Rulemaking that would help to harmonize the natural gas and electric industry schedules The Proposed Rulemaking would

1 begin the natural gas operating day five hours earlier to ensure no shortage of gas supply in the mornings,
2 move the first day-ahead gas nomination opportunity an hour and a half later so that electric utilities can finalize their schedules before gas-fired generators have to make gas purchase arrangements, and
3 add two more nomination cycles per day (for a total of four) to increase flexibility for all pipeline shippers

FERC ordered the natural gas and electric industries to work through the North American Energy Standards Board (NAESB) to develop draft new requirements within six months after the proposed rule appears in the *Federal Register* FERC will then take public comments for 60 days thereafter on the draft requirements

FERC also issued two related orders that would work in tandem with the new rulemaking In the first order, FERC began investigations into the day-ahead scheduling practices of RTOs and ISOs The second order requires all interstate natural gas pipelines to revise their tariffs so that offers can be made to purchase excess pipeline capacity

Referring to all of these actions, Commissioner John Norris essentially cautioned against a rush to build new pipeline capacity, saying, "these orders promote a more efficient use of our existing pipeline infrastructure by looking first to how pipelines and electric generators are operating before investing additional funds in new infrastructure "

electric transmission FERC Proceedings Natural Gas

Beginning of Workpaper
2200-2329.000 - Gas Transmission Planning

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub 5. Gas Transmission Planning
Cost Center: 2200-2329.000 - Gas Transmission Planning

Activity Description:

This is one of five shared services cost centers within the Energy Markets and Capacity Products organization.This organization is responsible for account management of SoCalGas' largest customers including electric generation and wholesales customers (not a shared service), and provides staff support for both SoCalGas and SDG&E on customer and policy issues related to activities in capacity products, storage products, capacity products support and energy markets staff support, gas scheduling, gas transmission planning and service to electric generation customers.

Gas Transmission Planning is responsible for gas system modeling and development of studies and recommendations for SoCalGas/SDG&E pipeline and compression facility changes due to revised demand forecasts, new customers desiring service at a certain point of receipt, or suppliers requesting receipt point access.

Forecast Explanations:

Labor - 5-YR Average

Labor costs in this organization were relatively flat for the recorded 5-years period. For consistency with the Energy Markets and Capacity Products organization, as well as for consistency with all other Customer Service - Information areas, 5-years average forecast methodology is used as the basis for TY2016 forecast with no incremental adjustments.

Non-Labor - 5-YR Average

5-year average forecasting methodology is selected to reflect continual non-labor core business functions and periodic expenses. For consistency with the Energy Markets & Capacity Products forecast methodology, as well as for consistency with all other Customer Service - Information areas, 5-years average is used as the basis for this area's non-labor TY2016 forecast with no incremental adjustments.

NSE - 5-YR Average

Not applicable.

Summary of Results:

	In 2013$ (000) Incurred Costs							
	Adjusted-Recorded					Adjusted-Forecast		
Years	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labor	567	537	569	607	567	569	569	569
Non-Labor	32	37	35	37	9	30	30	30
NSE	0	0	0	0	0	0	0	0
Total	**599**	**575**	**604**	**645**	**575**	**600**	**600**	**600**
FTE	5.9	5.6	6.2	6.8	7.0	6.3	6.3	6.3

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 5. Gas Transmission Planning
Cost Center: 2200-2329.000 - Gas Transmission Planning

Cost Center Allocations (Incurred Costs):

	2013 Adjusted-Recorded					2014 Adjusted-Forecast				
	Labor	Non-Labor	NSE	Total	FTE	Labor	Non-Labor	NSE	Total	FTE
Directly Retained	3	-25	0	-22	0.05	1	-7	0	-6	0.01
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	564	34	0	598	6.96	569	37	0	606	6.28
Total Incurred	**567**	**9**	**0**	**576**	**7.01**	**570**	**30**	**0**	**600**	**6.29**
% Allocation										
Retained	71.40%	71.40%				71.40%	71.40%			
SEU	28.60%	28.60%				28.60%	28.60%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

	2015 Adjusted-Forecast					2016 Adjusted-Forecast				
	Labor	Non-Labor	NSE	Total	FTE	Labor	Non-Labor	NSE	Total	FTE
Directly Retained	1	-7	0	-6	0.01	1	-7	0	-6	0.01
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	569	37	0	606	6.28	569	37	0	606	6.28
Total Incurred	**570**	**30**	**0**	**600**	**6.29**	**570**	**30**	**0**	**600**	**6.29**
% Allocation										
Retained	71.40%	71.40%				71.40%	71.40%			
SEU	28.60%	28.60%				28.60%	28.60%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

Cost Center Allocation Percentage Drivers/Methodology:

Cost Center Allocation Percentage for 2013

The allocation % is estimated proportionally based on the # of FTEs engaged in work related to SDG&E vs. # of FTEs engaged in work related to SoCalGas.

Cost Center Allocation Percentage for 2014

The allocation % is estimated proportionally based on the # of FTEs engaged in work related to SDG&E vs. # of FTEs engaged in work related to SoCalGas.

Cost Center Allocation Percentage for 2015

The allocation % is estimated proportionally based on the # of FTEs engaged in work related to SDG&E vs. # of FTEs engaged in work related to SoCalGas.

Cost Center Allocation Percentage for 2016

The allocation % is estimated proportionally based on the # of FTEs engaged in work related to SDG&E vs. # of FTEs engaged in work related to SoCalGas.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 5. Gas Transmission Planning
Cost Center: 2200-2329.000 - Gas Transmission Planning

Forecast Summary:

In 2013 $(000) Incurred Costs										
Forecast Method		**Base Forecast**			**Forecast Adjustments**			**Adjusted-Forecast**		
Years		**2014**	**2015**	**2016**	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Labor	5-YR Average	569	569	569	0	0	0	569	569	569
Non-Labor	5-YR Average	30	30	30	0	0	0	30	30	30
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		**600**	**600**	**600**	**0**	**0**	**0**	**600**	**600**	**600**
FTE	5-YR Average	6.3	6.3	6.3	0.0	0.0	0.0	6.3	6.3	6.3

Forecast Adjustment Details:

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2014 Total	**0**	**0**	**0**	**0**	**0.0**	
2015 Total	**0**	**0**	**0**	**0**	**0.0**	
2016 Total	**0**	**0**	**0**	**0**	**0.0**	

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 5. Gas Transmission Planning
Cost Center: 2200-2329.000 - Gas Transmission Planning

Determination of Adjusted-Recorded (Incurred Costs):

	2009 ($000)	2010 ($000)	2011 ($000)	2012 ($000)	2013 ($000)
Recorded (Nominal $)*					
Labor	0	426	467	512	486
Non-Labor	0	35	34	36	9
NSE	0	0	0	0	0
Total	**0**	**461**	**501**	**549**	**495**
FTE	0.0	4.8	5.3	5.8	6.0
Adjustments (Nominal $) **					
Labor	437	0	0	0	0
Non-Labor	29	0	0	0	0
NSE	0	0	0	0	0
Total	**466**	**0**	**0**	**0**	**0**
FTE	5.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal $)					
Labor	437	426	467	512	486
Non-Labor	29	35	34	36	9
NSE	0	0	0	0	0
Total	**466**	**461**	**501**	**549**	**495**
FTE	5.0	4.8	5.3	5.8	6.0
Vacation & Sick (Nominal $)					
Labor	79	75	78	82	81
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**79**	**75**	**78**	**82**	**81**
FTE	0.9	0.9	0.9	1.0	1.0
Escalation to 2013$					
Labor	51	37	24	13	0
Non-Labor	3	3	2	1	0
NSE	0	0	0	0	0
Total	**54**	**39**	**26**	**14**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2013$)					
Labor	567	537	569	607	567
Non-Labor	32	37	35	37	9
NSE	0	0	0	0	0
Total	**599**	**575**	**604**	**645**	**575**
FTE	5.9	5.7	6.2	6.8	7.0

* After company-wide exclusions of Non-GRC costs
** Refer to "Detail of Adjustments to Recorded" page for line item adjustments
Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: A. Energy Markets & Capacity Products
Category-Sub: 5. Gas Transmission Planning
Cost Center: 2200-2329.000 - Gas Transmission Planning

Summary of Adjustments to Recorded:

In Nominal $ (000) Incurred Costs					
Years	**2009**	**2010**	**2011**	**2012**	**2013**
Labor	437	0	0	0	0
Non-Labor	29	0	0	0	0
NSE	0	0	0	0	0
Total	**466**	**0**	**0**	**0**	**0**
FTE	5.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year/Expl.	Labor	NLbr	NSE	FTE	Adj_Type	From CCtr	RefID
2009	437	29	0	5.0	CCTR Transf	To 2200-0329.000	CMAK201311042 25736970
Cost alignment adjustment - Transfer Gas Transmission Planning labor, non-labor and FTE costs for 6 engineers and 1 manager from CC 2200-0329 to CC 2200-2329 due to reorganization. (Workpaper 2GT000.000 to Workpaper 2200-0329.000)							
2009 Total	**437**	**29**	**0**	**5.0**			
2010 Total	**0**	**0**	**0**	**0.0**			
2011 Total	**0**	**0**	**0**	**0.0**			
2012 Total	**0**	**0**	**0**	**0.0**			
2013 Total	**0**	**0**	**0**	**0.0**			

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. VP Customer Solutions
Cost Center: 2200-2282.000

Summary for Category: B. VP Customer Solutions

	In 2013$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	229	339	339	339
Non-Labor	36	103	103	103
NSE	0	0	0	0
Total	**265**	**442**	**442**	**442**
FTE	1.1	2.0	2.0	2.0

Cost Centers belonging to this Category:

2200-2282.000 VP Customer Solutions

Labor	229	339	339	339
Non-Labor	36	103	103	103
NSE	0	0	0	0
Total	**265**	**442**	**442**	**442**
FTE	1.1	2.0	2.0	2.0

Note: Totals may include rounding differences.

Beginning of Workpaper
2200-2282.000 - VP Customer Solutions

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. VP Customer Solutions
Category-Sub 1. VP Customer Solutions
Cost Center: 2200-2282.000 - VP Customer Solutions

Activity Description:

The Customer Solutions vice-president oversees both shared and non-shared activities within the Customer Solutions organization. The non-shared activities include Customer Engagement & Insights, Customer Programs, Customer Assistance, and Segment Services' account management and customer services of all residential, small, medium, large commercial, industrial customers and government accounts (excluding wholesales and electric generation which falls under the supervision of VP Engineering and Operational Staff). The Customer Solutions vice-president is also responsible for overseeing Technologies Solutions for both SoCalGas and SDG&E, which consists of activities such as market development, emerging technologies, NGVs, and research & development, which are activities covered in the Customer Service Technologies, Policies, & Solutions RD witness area (J.Reed).

Forecast Explanations:

Labor - 5-YR Average

Labor and FTE numbers fluctuated in 2012-2013 due to a temporary and transitional reorganization gap. 5-year average forecasting methodology is used as the basis for TY2016 forecast to reflect continual support of core business functions and activities as well as for consistency with all other Customer Service - Information areas.

Non-Labor - 5-YR Average

Non-labor numbers fluctuated across the 5 years historical data due to periodic/cyclical expenses. These are common atypical expendutures to support market studies, align customer service priorities, and investigate development of new products and services. Subsequently, a 5 years average approach was taken to smooth costs and provide a full representation of common expenses, as well as for consistency with the Customer Service - Information forecasting methodologies for all other accounts.

NSE - 5-YR Average

Not applicable.

Summary of Results:

	In 2013$ (000) Incurred Costs							
	Adjusted-Recorded					Adjusted-Forecast		
Years	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labor	366	362	424	316	229	339	339	339
Non-Labor	34	276	90	77	36	103	103	103
NSE	0	0	0	0	0	0	0	0
Total	**400**	**638**	**514**	**393**	**265**	**442**	**442**	**442**
FTE	2.2	2.2	2.6	1.8	1.1	2.0	2.0	2.0

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. VP Customer Solutions
Category-Sub: 1. VP Customer Solutions
Cost Center: 2200-2282.000 - VP Customer Solutions

Cost Center Allocations (Incurred Costs):

	2013 Adjusted-Recorded					2014 Adjusted-Forecast				
	Labor	Non-Labor	NSE	Total	FTE	Labor	Non-Labor	NSE	Total	FTE
Directly Retained	1	3	0	4	0.01	0	3	0	3	0.00
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	228	33	0	261	1.06	339	99	0	438	1.99
Total Incurred	**229**	**36**	**0**	**265**	**1.07**	**339**	**102**	**0**	**441**	**1.99**
% Allocation										
Retained	99.63%	99.63%				99.63%	99.63%			
SEU	0.37%	0.37%				0.37%	0.37%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

	2015 Adjusted-Forecast					2016 Adjusted-Forecast				
	Labor	Non-Labor	NSE	Total	FTE	Labor	Non-Labor	NSE	Total	FTE
Directly Retained	0	3	0	3	0.00	0	3	0	3	0.00
Directly Allocated	0	0	0	0	0.00	0	0	0	0	0.00
Subj. To % Alloc.	339	99	0	438	1.99	339	99	0	438	1.99
Total Incurred	**339**	**102**	**0**	**441**	**1.99**	**339**	**102**	**0**	**441**	**1.99**
% Allocation										
Retained	99.63%	99.63%				99.63%	99.63%			
SEU	0.37%	0.37%				0.37%	0.37%			
CORP	0.00%	0.00%				0.00%	0.00%			
Unreg	0.00%	0.00%				0.00%	0.00%			

Cost Center Allocation Percentage Drivers/Methodology:

Cost Center Allocation Percentage for 2013

The allocation % deviates from historical Multi-Factor methodology and instead uses a cost calculation methodology to accurately reflect results of reorganization and shared costs realignment.

Cost Center Allocation Percentage for 2014

The allocation % deviates from historical Multi-Factor methodology and instead uses a cost calculation methodology to accurately reflect results of reorganization and shared costs realignment.

Cost Center Allocation Percentage for 2015

The allocation % deviates from historical Multi-Factor methodology and instead uses a cost calculation methodology to accurately reflect results of reorganization and shared costs realignment.

Cost Center Allocation Percentage for 2016

The allocation % deviates from historical Multi-Factor methodology and instead uses a cost calculation methodology to accurately reflect results of reorganization and shared costs realignment.

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. VP Customer Solutions
Category-Sub: 1. VP Customer Solutions
Cost Center: 2200-2282.000 - VP Customer Solutions

Forecast Summary:

In 2013 $(000) Incurred Costs										
Forecast Method		**Base Forecast**			**Forecast Adjustments**			**Adjusted-Forecast**		
Years		**2014**	**2015**	**2016**	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Labor	5-YR Average	339	339	339	0	0	0	339	339	339
Non-Labor	5-YR Average	103	103	103	0	0	0	103	103	103
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		**442**	**442**	**442**	**0**	**0**	**0**	**442**	**442**	**442**
FTE	5-YR Average	2.0	2.0	2.0	0.0	0.0	0.0	2.0	2.0	2.0

Forecast Adjustment Details:

Year/Expl.	Labor	NLbr	NSE	Total	FTE	Adj Type
2014 Total	**0**	**0**	**0**	**0**	**0.0**	
2015 Total	**0**	**0**	**0**	**0**	**0.0**	
2016 Total	**0**	**0**	**0**	**0**	**0.0**	

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. VP Customer Solutions
Category-Sub: 1. VP Customer Solutions
Cost Center: 2200-2282.000 - VP Customer Solutions

Determination of Adjusted-Recorded (Incurred Costs):

	2009 ($000)	2010 ($000)	2011 ($000)	2012 ($000)	2013 ($000)
Recorded (Nominal $)*					
Labor	58	60	335	266	196
Non-Labor	9	209	77	75	36
NSE	0	0	0	0	0
Total	**67**	**270**	**412**	**342**	**233**
FTE	0.9	0.9	2.2	1.6	0.9
Adjustments (Nominal $) **					
Labor	230	230	13	0	0
Non-Labor	22	48	9	0	0
NSE	0	0	0	0	0
Total	**252**	**278**	**22**	**0**	**0**
FTE	1.0	1.0	0.1	0.0	0.0
Recorded-Adjusted (Nominal $)					
Labor	287	290	348	266	196
Non-Labor	31	257	86	75	36
NSE	0	0	0	0	0
Total	**319**	**548**	**434**	**342**	**233**
FTE	1.9	1.9	2.3	1.6	0.9
Vacation & Sick (Nominal $)					
Labor	46	47	58	43	33
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	**46**	**47**	**58**	**43**	**33**
FTE	0.3	0.3	0.4	0.3	0.2
Escalation to 2013$					
Labor	33	25	18	7	0
Non-Labor	3	19	4	2	0
NSE	0	0	0	0	0
Total	**36**	**43**	**22**	**9**	**0**
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2013$)					
Labor	366	362	424	316	229
Non-Labor	34	276	90	77	36
NSE	0	0	0	0	0
Total	**400**	**638**	**514**	**393**	**265**
FTE	2.2	2.2	2.7	1.9	1.1

* After company-wide exclusions of Non-GRC costs
** Refer to "Detail of Adjustments to Recorded" page for line item adjustments
Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. VP Customer Solutions
Category-Sub: 1. VP Customer Solutions
Cost Center: 2200-2282.000 - VP Customer Solutions

Summary of Adjustments to Recorded:

In Nominal $ (000) Incurred Costs					
Years	**2009**	**2010**	**2011**	**2012**	**2013**
Labor	230	230	13	0	0
Non-Labor	22	48	9	0	0
NSE	0	0	0	0	0
Total	**252**	**278**	**22**	**0**	**0**
FTE	1.0	1.0	0.1	0.0	0.0

Detail of Adjustments to Recorded:

Year/Expl.	Labor	NLbr	NSE	FTE	Adj_Type	From CCtr	RefID
2009	230	22	0	1.0	CCTR Transf	From 2100-3701.000	CSCHRAMM2013 1030114445713
Transfer associated SCG Shared Services VP Customer Solutions labor and non-labor historical dollars from cost center 2100-3701 in Work Group 1OO012 to the SCG USS cost center 2200-2282 where activity resides.							
2009 Total	**230**	**22**	**0**	**1.0**			
2010	230	48	0	1.0	CCTR Transf	From 2100-3701.000	CSCHRAMM2013 1030114607590
Transfer associated SCG Shared Services VP Customer Solutions labor and non-labor historical dollars from cost center 2100-3701 in Work Group 1OO012 to the SCG USS cost center 2200-2282 where activity resides.							
2010 Total	**230**	**48**	**0**	**1.0**			
2011	13	9	0	0.1	CCTR Transf	From 2100-3701.000	CSCHRAMM2013 1030114650473
Transfer associated SCG Shared Services VP Customer Solutions labor and non-labor historical dollars from cost center 2100-3701 in Work Group 1OO012 to the SCG USS cost center 2200-2282 where activity resides.							
2011 Total	**13**	**9**	**0**	**0.1**			
2012 Total	**0**	**0**	**0**	**0.0**			

Note: Totals may include rounding differences.

Area: CS - INFORMATION
Witness: Ann D. Ayres
Category: B. VP Customer Solutions
Category-Sub: 1. VP Customer Solutions
Cost Center: 2200-2282.000 - VP Customer Solutions

Year/Expl.	Labor	NLbr	NSE	FTE	Adj Type	From CCtr	RefID
2013 Total	**0**	**0**	**0**	**0.0**			

Note: Totals may include rounding differences.

Supplemental Workpapers for Workpaper 2200-2282.000

RESPONSES TO INFORMAL DATA REQUESTS & DEFICIENCIES

ORA INFORMAL – SDG&E/SOCALGAS-DR-05, SOCALGAS-ORA-DEF-004-TLG, and SOCALGAS-ORA-DEF-028-TLG

Supporting the Request of Ann D. Ayres

Customer Service-Information

Note: All documents have been updated to reflect the most current pagination references and also reflect removal of the Capital IT project: 00754A – PT81421 California Producers ENVOY

SoCalGas Exhibit-12
Customer Service Information
Roadmap for ERR Testimony & Workpapers

Functional Area	Testimony Area	Work Paper Group	Ex. SCG-12, Testimony Pages	Ex. SCG-12-WP, Workpaper Pages X of 328	MDR Response	WP Group FERC Accounts	FERC Allocation % [2]	Cost Centers in Group
Customer Service - Information, Exhibit No.: SCG-12, Witness: Ann D. Ayres			**pp. ADA-1 to 78**	*1-2*	*Chapter 8, Q.6*			
	Non-Shared Costs - Section II.B.							
	Customer Engagement & Insights							
		Customer Engagement & Insights - 2IN001.000	***pp. ADA-9, line 4 to ADA-30, line 14***	*3-14*	*Chapter 8, Q.2, 8-9*	*908.0*	*100.0%*	*2200-0428*
		Supplemental #1 - Citation Footnote No 21	pp ADA-17, line 13 to 15	16-18				*2200-2076*
		Supplemental #2 - Citation Footnote No 22	pp ADA-19, line 3 to 6	19-21				*2200-2143*
		Supplemental #3 - Citation Footnote No 26	pp ADA-19, line 23	22-23				*2200-2188*
		Supplemental #4 - Citation Footnote No 27	pp ADA-19, line 25 to ADA-20, line 2	24-26				*2200-2215*
		Supplemental #5 - Citation Footnote No 28	pp ADA-20, line 5 to 8	27-30				*2200-2320*
		Supplemental #6 - Citation Footnote No 30	pp ADA-21, line 9 to 13	31-32				*2200-2321*
		Supplemental #7 - Citation Footnote No 33	pp ADA-22, line 11 to 13	33-34				*2200-2351*
		Supplemental #8 - Citation Footnote No 36 and 37	pp ADA-23, line 15 to 22	35-38				
		Supplemental #9 - Citation Footnote No 39 and 40	pp ADA-24, line 11 to 21	39-43				
		Supplemental #10 - Citation Footnote No 41	pp ADA-25, line 7 to 10	44-46				
		Supplemental #11 - Citation Footnote No 42	pp ADA-25, line 10 to 14	47-50				
		Supplemental #12 - Citation Footnote No 43 to 46	pp ADA-27, line 13 to ADA-28, line 6	51-53				
		Supplemental #13 - Citation Footnote No 47	pp ADA-28, line 6 to 8	54-58				
		Supplemental #14 - Citation Footnote No 48	pp ADA-28, line 9 to 11	59-62				
		Supplemental #15 - Citation Footnote No 49 & 50	pp ADA-28, line 11 to 14	63-64				
	Non-Shared Costs - Section II.C.							
	Customer Assistance							
		Customer Assistance - 2IN002.000	***pp. ADA-30, line 15 to ADA-37, line 23***	*65-71*	*Chapter 8, Q.2, 8-9*	*908.0*	*100%*	*2200-0356*
		Supplemental #16 - Citation Footnote No 5 and 54	pp ADA-8, line 2 to 4, ADA-32, line 6 to 9	73-75				*2200.0402*
		Supplemental #17 - Citation Footnote No 51 and 53	pp ADA-30, line 20 to 22, ADA-32, line 4 to 6	76-95				*2200-2032*
		Supplemental #18 - Citation Footnote No 55	pp ADA-32, line 11 to 13	96-98				*2200-2033*
		Supplemental #19 - Citation Footnote No 57	pp ADA-32, line 24 to 25	99-101				*2200-2034*
		Supplemental #20 - Citation Footnote No 58	pp ADA-33, line 10 to 12	102-103				*2200-2035*
		Supplemental #21 - Calculation NGAT Cost Components Footnote No 64, 66 and 68	pp ADA-34, line 15 to ADA-35, line 17	104-105				*2200-2118*
		Supplemental #22 - Citation Footnote No 69	pp ADA-35, line 14 to ADA-36, line 2	106-107				
		Supplemental #23 - Citation Footnote No 72	pp ADA-36, line 18 to 22	108-109				
		Supplemental #24 - Citation Footnote No 73	pp ADA-36, line 18 to 22	110-113				
	Non-Shared Costs - Section II.D.							
	Customer Segment Markets							
	1 Energy Markets & Capacity Products							

Functional Area	Testimony Area	Work Paper Group	Ex. SCG-12, Testimony Pages	Ex. SCG-12-WP, Workpaper Pages X of 328	MDR Response	WP Group FERC Accounts	FERC Allocation % [2]	Cost Centers in Group
		Energy Markets & Capacity Products - 2IN003.000	*pp. ADA-37, line 24 to ADA-47, line 11*	*114-122*	*Chapter 8, Q.2, 8-9*	*814.0*	*16.26%*	*2200-0248*
						908.0	*83.74%*	*2200-0249*
						Total	*100.00%*	*2200-0250*
		Supplemental #25 - Citation Footnote No 77 and 83	pp ADA-38, line 3 to 7, ADA-41 line 15 to 19	124-126				*2200-0251*
		Supplemental #26 - Citation Footnote No 78	pp ADA-39, line 7 to ADA-40, line 1	127-129				*2200-0327*
		Supplemental #27 - Citation Footnote No 79	pp ADA-39, line 7 to ADA-40, line 1	130-133				*2200-2037*
		Supplemental #28 - Citation Footnote No 80	pp ADA-40, line 5 to 8	134-135				*2200-2146*
		Supplemental #29 - Citation Footnote No 81 and 82	pp ADA-40, line 16 to 18	136-139				*2200-2187*
		Supplemental #30 - Citation Footnote No 86	pp ADA-45, line 6 to 11	140-144				
		Supplemental #31 - Citation Footnote No 88	pp ADA-46, line 6 to 8	145-150				
		Supplemental #32 - Citation Footnote No 89	pp ADA-46, line 6 to 9	151-156				
		Supplemental #33 - Citation Footnote No 90	pp ADA-46, line 6 to 9	157-158				
		Supplemental #34 - Citation Footnote No 91	pp ADA-46, line 6 to 11	159-161				
		Supplemental #35 - Citation Footnote No 92	pp ADA-46, line 6 to 11	161-163				
	2 Segment Services							
		Segment Services - 2IN004.000	*pp. ADA-47, line 12 to ADA-62, line 16*	*164-172*	*Chapter 8, Q.2, 8-9*	*908.0*	*100%*	*2200-0177*
		Supplemental #36 - Citation Footnote No 98	pp ADA-48, line 18 to ADA-49, line 1	174-182				*2200-0229*
		Supplemental #37 - Citation Footnote No 103	pp ADA-50, line 4 to 6	183-196				*2200-0230*
		Supplemental #38 - Citation Footnote No 104	pp ADA-50, line 7 to 8	197-199				*2200-0231*
		Supplemental #39 - Citation Footnote No 112	pp ADA-57, line 16 to 18	200-202				*2200-0232*
		Supplemental #40 - Citation Footnote No 114 and 115	pp ADA-58, line 1 to 7	203-215				*2200-0236*
		Supplemental #41 - Citation Footnote No 116	pp ADA-58, line 17 to 18	216-221				*2200-0422*
		Supplemental #42 - Citation Footnote No 117	pp ADA-58, line 18 to 21	222-229				*2200-0424*
		Supplemental #43 - Citation Footnote No 118	pp ADA-58, line 25 to ADA-59, line 1	230-234				*2200-0429*
		Supplemental #44 - Citation Footnote No 119	pp ADA-59, line 1 to 3	235-238				*2200-0843*
		Supplemental #45 - Citation Footnote No 122	pp ADA-59, line 18 to ADA-60, line 1	239-241				*2200-2048*
		Supplemental #46 - Citation Footnote No 124	pp ADA-60, line 22 to 24	242-245				*2200-2057*
		Supplemental #47 - Citation Footnote No 125	pp ADA-60, line 24 to 25	246-248				*2200-2060*
		Supplemental #48 - Citation Footnote No 126	pp ADA-61, line 3 to 5	249-251				*2200-2061*
		Supplemental #49 - Citation Footnote No 127 to 129, 131 and 133	pp ADA-61, line 10 to ADA-62, line 16	252-277				*2200-2087*
								2200-2100
								2200-2136
								2200-2177

Functional Area	Testimony Area	Work Paper Group	Ex. SCG-12, Testimony Pages	Ex. SCG-12-WP, Workpaper Pages X of 328	MDR Response	WP Group FERC Accounts	FERC Allocation % [2]	Cost Centers in Group
								2200-2193
								2200-2194
								2200-2205
								2200-2234
								2200-2238
								2200-2287
								2200-2326
								2200-2327
								2200-2328
	Shared Costs - Section III.B.							
	Energy Markets & Capacity Products							
		Energy Markets & Capacity Products - Director - 2200.0246.000	*pp. ADA-65, line 9 to 12*	*280-286*	*Chapter 8, Q.5, 7-9*	*907.0*	*66.79%*	*2200-0246*
						908.0	*33.21%*	
						Total	*100.00%*	
		Capacity Products Support - 2200-0328.000	*pp. ADA-65, line 13 to ADA-66, line 28; ADA-68, line 9 to ADA-69, line 3*	*287-294*	*Chapter 8, Q.5, 7-9*	*850.0*	*90.65%*	*2200-0328*
						908.0	*9.35%*	
						Total	*100.00%*	
		Capacity Products Staff - 2200-0330.000	*pp. ADA-67, line 1 to 23; ADA-68, line 9 to ADA-69, line 3*	*295-301*	*Chapter 8, Q.5, 7-9*	*814.0*	*47.51%*	*2200-0330*
						850.0	*52.49%*	
						Total	*100.00%*	
		Gas Scheduling - 2200.2158.000	*pp. ADA-67, line 24 to ADA-68, line 3; ADA-68, line 9 to ADA-69, line 3*	*302-309*	*Chapter 8, Q.5, 7-9*	*851.0*	*100%*	*2200-2158*
		Gas Transmission Planning - 2200-2329.000	*pp. ADA-67, line 4 to ADA-69, line 3*	*313-319*	*Chapter 8, Q.5, 7-9*	*814.0*	*29.56%*	*2200-2329*
						850.0	*70.44%*	
						Total	*100.00%*	
	Shared Costs - Section III.C.							

Functional Area	Testimony Area	Work Paper Group	Ex. SCG-12, Testimony Pages	Ex. SCG-12-WP, Workpaper Pages X of 328	MDR Response	WP Group FERC Accounts	FERC Allocation % [2]	Cost Centers in Group
	VP Customer Solutions							
		VP Customer Solutions - 2200.2282.000	*pp. ADA-69, line 4 to ADA-70, line 7*	*320-326*	*Chapter 8, Q.5, 7-9*	*920.0*	*85.87%*	*2200-2282*
						921.0	*14.13%*	
						Total	*100.00%*	
	Capital (IT Projects) - Section IV.							
		B. SoCalGas ENVOY®						
		1. SoCalGas ENVOY ® & MCS Sybase Database Upgrade, Project # 81439	*pp. ADA-72, line 16 to 27*	*Ex. SCG-18-CWP (C.Olmsted), pp. 124-129 of 823; SCG-12-WP, pp. 339-344*				
		2. SoCalGas ENVOY ® MCS Data Controls, Project # 81438	*pp. ADA-72, line 28 to ADA-73, line 7*	*Ex. SCG-18-CWP (C. Olmsted), pp. 161-167 of 823; SCG-12-WP, pp. 376-382*				
		3. Gas and Electric Harmonization, Workpaper # 00754B	*pp. ADA-73, line 18 to 24*	*Ex. SCG-18-CWP (C. Olmsted), pp. 146-150 of 823; SCG-12-WP, pp. 361-365*				
		Supplemental #50 - 2200-2158 000_Supp1 pdf = Citation Footnote No 140	pp ADA-73, line 18 to 24	311-312				
		4. Low OFO and EFO, Workpaper # 00754C	*pp. ADA-74, line 1 to 17*	*Ex. SCG-18-CWP (C. Olmsted), pp. 151-155 of 823; SCG-12-WP, pp. 366-370*				
		5. SoCalGas ENVOY ® Next Generation, Project # 14803	*pp. ADA-74, line 18 to 26*	*Ex. SCG-18-CWP (C. Olmsted), pp. 175-179 of 823; SCG-12-WP, pp. 390-394*				
		C. NAESB EDIX Upgrade, Project # 14869	*pp. ADA-74, line 27 to ADA-75, line 14*	*Ex. SCG-18-CWP (C. Olmsted), pp. 156-160 of 823; SCG-12-WP, pp. 371-375*				
		D. SoCalGas.com Technology Upgrade, Project # 14829	*pp. ADA-75, line 15 to ADA-76, line 14*	*Ex. SCG-18-CWP (C. Olmsted), pp. 130-134 of 823; SCG-12-WP, pp. 345-349*				
		E. C&I Next Generation, Project # 14827, # 15802	*pp. ADA-76, line 15 to ADA-77, line 26*	*Ex. SCG-18-CWP (C. Olmsted), pp. 135-145 of 823; SCG-12-WP, pp. 350-360*				
		F. Email Campaign Management, Project # 14825	*pp. ADA-77, line 27 to ADA-78, line 30*	*Ex. SCG-18-CWP (C. Olmsted), pp. 168-174 of 823; SCG-12-WP, pp. 383-389*				
Workpaper Appendix A - NSS Cost Center Listing				427-428		n/a		

[1] Except where noted otherwise, referenced workpaper pages are located in Exhibit SCG-12-WP

[2] FERC accounts charged by Customer Service Information (CSIN) cost center workgroups and USS cost centers may also be charged by areas other than CSIN

ORA Informal Data Request
ORA INFORMAL-SDG&E/SoCalGas-DR-05
Question 2 Attachments

Witness Name	Ann D. Ayres								
Constant 2013$ in Thousands									
	Adjusted Recorded					Forecast			Workpaper Page
	2009	2010	2011	2012	2013	2014	2015	2016	
SCG									
Exh No SCG-12-WP									
OM Total	**20,480**	**24,143**	**22,190**	**21,263**	**19,983**	**22,370**	**26,143**	**28,031**	
Non-Shared									
2IN001.000 - Customer Engagement & Insights									
Labor	1,265	1,913	1,846	1,655	1,542	1,644	2,099	2,458	
NLbr	4,385	6,463	5,127	4,613	4,377	4,992	6,162	6,432	
NSE	0	0	0		0	0	0	0	
2IN001 000 Total	5,650	8,376	6,973	6,268	5,919	6,636	8,261	8,890	Page 6 of 328
2IN002.000 - Customer Assistance									
Labor	166	185	189	179	170	178	178	178	
NLbr	2,225	3,368	3,431	3,403	2,664	3,222	3,825	4,075	
NSE			0			0	0	0	
2IN002 000 Total	2,391	3,553	3,620	3,582	2,834	3,400	4,003	4,253	Page 67 of 328
2IN003 000 - Energy Markets & Capacity Products									
Labor	1,864	1,786	1,705	1,688	1,727	1,754	1,971	1,971	
NLbr	151	117	93	100	74	107	107	107	
NSE	0	0	0	0	0	0	0	0	
2IN003 000 Total	2,015	1,903	1,798	1,788	1,801	1,861	2,078	2,078	Page 116 of 328
2IN004 000 - Segment Services									
Labor	5,922	5,394	5,350	5,223	4,950	5,493	6,056	6,564	
NLbr	1,430	1,556	1,300	1,417	1,568	1,775	2,444	2,849	
NSE	0	0	0			0	0	0	
2IN004 000 Total	7,352	6,950	6,650	6,640	6,518	7,268	8,500	9,413	Page 165 of 328
Shared Services									
2200-0246 000 - Energy Markets & Capacity Products Director									
Labor	233	194	219	225	266	227	227	227	
NLbr	80	78	64	61	72	71	71	71	
NSE	0					0	0	0	
2200-0246 000 Total	313	272	283	286	338	298	298	298	Page 281 of 328
2200-0328 000 - Capacity Products Support									
Labor	633	663	553	534	624	710	710	710	
NLbr	16	12	63	22	15	26	26	26	
NSE	0	0	0	0	0	0	0	0	
2200-0328 000 Total	649	675	616	556	639	736	736	736	Page 288 of 328
2200-0330 000 - Capacity Products Staff									
Labor	498	567	557	554	516	539	539	539	
NLbr	70	74	75	41	23	57	57	57	
NSE						0	0	0	
2200-0330 000 Total	568	641	632	595	539	596	596	596	Page 296 of 328
2200-2158 000 - Gas Scheduling									
Labor	493	529	472	493	543	506	602	698	

Note: Totals may include rounding differences.

ORA Informal Data Request
ORA INFORMAL-SDG&E/SoCalGas-DR-05
Question 2 Attachments

Witness Name	Ann D Ayres								
Constant 2013$ in Thousands									
	Adjusted Recorded					Forecast			Workpaper Page
	2009	2010	2011	2012	2013	2014	2015	2016	
NLbr	50	32	30	18	11	28	28	28	
NSE						0	0	0	
2200-2158 000 Total	543	561	502	511	554	534	630	726	Page 304 of 328
2200-2282.000 - VP Customer Solutions									
Labor	366	362	424	316	229	339	339	339	
NLbr	34	276	89	77	36	102	102	102	
NSE	0	0	0			0	0	0	
2200-2282.000 Total	400	638	513	393	265	441	441	441	Page 321 of 328
2200-2329.000 - Gas Transmission Planning									
Labor	567	537	568	607	567	570	570	570	
NLbr	32	37	35	37	9	30	30	30	
NSE	0					0	0	0	
2200-2329 000 Total	599	574	603	644	576	600	600	600	Page 314 of 328

Note: Totals may include rounding differences.

Application of SOUTHERN CALIFORNIA GAS COMPANY for authority to update its gas revenue requirement and base rates effective January 1, 2016 (U 904-G)

Application No. 14-11-004

Exhibit No.: (SCG-18-CWP-R)

REVISED CAPITAL WORKPAPERS TO PREPARED DIRECT TESTIMONY OF CHRISTOPHER R. OLMSTED ON BEHALF OF SOUTHERN CALIFORNIA GAS COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

MARCH 2015

2016 General Rate Case - REVISED

INDEX OF WORKPAPERS

Exhibit SCG-18-CWP-R - INFORMATION TECHNOLOGY

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Category	D CS- Information
Workpaper	VARIOUS

Summary for Category: D. CS- Information

	In 2013$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	0	1,207	2,375	708
Non-Labor	0	3,204	10,342	1,770
NSE	0	0	0	0
Total	**0**	**4,411**	**12,717**	**2,478**
FTE	0 0	12 3	23 2	6 9
00774J PT81439 ENVOY & MCS SYBASE DATABASE UPGRADE				
Labor	0	651	237	0
Non-Labor	0	1,110	700	0
NSE	0	0	0	0
Total	**0**	**1,761**	**937**	**0**
FTE	0 0	6 4	2 3	0 0
00774A PT14803 - Envoy Next Generation				
Labor	0	41	348	464
Non-Labor	0	0	1,700	1,200
NSE	0	0	0	0
Total	**0**	**41**	**2,048**	**1,664**
FTE	0 0	0 9	3 4	4 5
00774C PT14829 - socalgas.com technology upgrade				
Labor	0	41	35	0
Non-Labor	0	1,595	1,314	0
NSE	0	0	0	0
Total	**0**	**1,636**	**1,349**	**0**
FTE	0 0	0 4	0 3	0 0
00774G PT14827 C&I Next Generation Phase I				
Labor	0	73	201	0
Non-Labor	0	263	2,252	0
NSE	0	0	0	0
Total	**0**	**336**	**2,453**	**0**
FTE	0 0	0 7	2 0	0 0
00774I PT15802 C&I Next Generation Phase 2 and 3				
Labor	0	0	232	232
Non-Labor	0	0	1,510	570
NSE	0	0	0	0
Total	**0**	**0**	**1,742**	**802**
FTE	0 0	0 0	2 3	2 3

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area INFORMATION TECHNOLOGY
Witness Christopher R Olmsted
Category D CS- Information
Workpaper VARIOUS

	In 2013$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
00754B Gas and Electric Harmonization				
Labor	0	0	391	0
Non-Labor	0	0	862	0
NSE	0	0	0	0
Total	**0**	**0**	**1,253**	**0**
FTE	0 0	0 0	3 8	0 0
00754C Low OFO and EFO				
Labor	0	0	309	0
Non-Labor	0	0	647	0
NSE	0	0	0	0
Total	**0**	**0**	**956**	**0**
FTE	0 0	0 0	3 0	0 0
00766A PT14869 NAESB EDIX Upgrade				
Labor	0	0	262	0
Non-Labor	0	0	24	0
NSE	0	0	0	0
Total	**0**	**0**	**286**	**0**
FTE	0 0	0 0	2 6	0 0
00774K PT81438 ENVOY MCS DATA CONTROLS				
Labor	0	377	217	12
Non-Labor	0	148	400	0
NSE	0	0	0	0
Total	**0**	**525**	**617**	**12**
FTE	0 0	3 7	2 1	0 1
00774B PT14825 - Email Campaign Management				
Labor	0	24	143	0
Non-Labor	0	88	933	0
NSE	0	0	0	0
Total	**0**	**112**	**1,076**	**0**
FTE	0 0	0 2	1 4	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Group
00774J - PT81439 ENVOY & MCS SYBASE DATABASE UPGRADE

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	1 Technical Obsolescence
Workpaper Group	00774J - PT81439 ENVOY & MCS SYBASE DATABASE UPGRADE

Summary of Results (Constant 2013 $ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
Years		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	651	237	0
Non-Labor	Zero-Based	0	0	0	0	0	1,110	700	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**	**1,761**	**937**	**0**
FTE	Zero-Based	0 0	0 0	0 0	0 0	0 0	6.4	2 3	0 0

Business Purpose:

Project will upgrade legacy Sybase database environment to an enterprise SQL database platform and upgrade MCS application server from HP-UX to Linux, due to software and hardware obsolescence and end-of-life This solution is the most cost effective replacement system, as it consolidates IT database technologies

Physical Description:

All functional and non functional attributes should be retained This includes interfaces with other systems, performance of online and batch processes, security requirements and SLA
Remediate Envoy and MCS Applications to work with SQL Server database instead of using Sybase
Review and retrofit/replace MCS Application components using Open Server API libraries
To move out from the remaining HP-UX, AIX Server & Sybase legacy system and compliant to TRM

Project Justification:

Software and hardware have reached end-of-life and obsolescence, and replacement and upgrade system is necessary
This software and hardware vendor replacement choice avoids incurring an additional $240,000/year software support license cost as compared to the alternative vendor choice

Note. Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	1 Technical Obsolescence
Workpaper Group	00774J - PT81439 ENVOY & MCS SYBASE DATABASE UPGRADE

Forecast Methodology:

Labor - Zero-Based

The forecast is based upon the current project timeline

Non-Labor - Zero-Based

The forecast is based upon the current project timeline

NSE - Zero-Based

N/A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Sub Details for
Workpaper Group 00774J

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	1 Technical Obsolescence
Workpaper Group	00774J - PT81439 ENVOY & MCS SYBASE DATABASE UPGRADE
Workpaper Detail	00774J 001 - ENVOY & MCS SYBASE DATABASE UPGRADE
In-Service Date	12/31/2014
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	651	0	0
Non-Labor	1,110	0	0
NSE	0	0	0
Total	**1,761**	**0**	**0**
FTE	6 4	0 0	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	1 Technical Obsolescence
Workpaper Group	00774J - PT81439 ENVOY & MCS SYBASE DATABASE UPGRADE
Workpaper Detail	00774J 002 - ENVOY & MCS SYBASE DATABASE UPGRADE
In-Service Date	12/31/2015
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	0	237	0
Non-Labor	0	700	0
NSE	0	0	0
Total	**0**	**937**	**0**
FTE	0 0	2 3	0 0

Note. Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Group
00774C - PT14829 - socalgas.com technology upgrade

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	2 Improving Customer Experience
Workpaper Group	00774C - PT14829 - socalgas com technology upgrade

Summary of Results (Constant 2013 $ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
Years		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	41	35	0
Non-Labor	Zero-Based	0	0	0	0	0	1,595	1,314	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**	**1,636**	**1,349**	**0**
FTE	Zero-Based	0 0	0 0	0 0	0 0	0 0	0 4	0 3	0 0

Business Purpose:

Project will replace aging and un-supported TeamSite content management system used for socalgas com and other micro-sites shown at socalgas com

Physical Description:

Project will replace TeamSite content management system with Oracle Sites Project will create automation to migrate content from old platform to new platform Project will create responsive design software to render socalgas com pages in desktop, tablet and mobile device sizes, depending on the device

Project Justification:

Project will provide,
1 Quicker turn around on website updates or additions
2 Provides content owners with the ability to update socalgas com and not rely on web team for updates
3 Responsive design will give customers complete access to SoCalGas programs and services regardless of the device used

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	2 Improving Customer Experience
Workpaper Group	00774C - PT14829 - socalgas com technology upgrade

Forecast Methodology:

Labor - Zero-Based

Estimate based on internal labor hours quotations

Non-Labor - Zero-Based

Estimate based on vendor quotations

NSE - Zero-Based

N/A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Sub Details for
Workpaper Group 00774C

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	2 Improving Customer Experience
Workpaper Group	00774C - PT14829 - socalgas com technology upgrade
Workpaper Detail	00774C 001 - socalgas com upgrade
In-Service Date	12/31/2015
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	41	35	0
Non-Labor	1,595	1,314	0
NSE	0	0	0
Total	**1,636**	**1,349**	**0**
FTE	0 4	0 3	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Group
00774G - PT14827 C&I Next Generation Phase I

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	2 Improving Customer Experience
Workpaper Group	00774G - PT14827 C&I Next Generation Phase I

Summary of Results (Constant 2013 $ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
Years		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	73	201	0
Non-Labor	Zero-Based	0	0	0	0	0	263	2,252	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**	**336**	**2,453**	**0**
FTE	Zero-Based	0 0	0 0	0 0	0 0	0 0	0 7	2 0	0 0

Business Purpose:

This is pilot is to provide field representatives, beginning with Account Executive (Account Representatives), with a mobile enablement tool to increase the effectiveness of customer transactions in face-to-face meetings and site visits

Physical Description:

Create a mobile accessible application to aggregate various enterprise databases and contain robust data retrieval and reporting abilities This will equip Account Representatives with light, portable devices, that can wirelessly connect to company information systems and websites, and include functionalities such as mapping, auditing, reporting, tracking, contracting, and program enrollment applications

Project Justification:

This will introduce new mobile technology to Account Representatives to increase effectiveness of customer interactions, driving higher rates of engagement in various programs and services This will also improve current documentation and information verification processes through data input process standardization

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	2 Improving Customer Experience
Workpaper Group	00774G - PT14827 C&I Next Generation Phase I

Forecast Methodology:

Labor - Zero-Based

Estimate based on internal labor hours quotations

Non-Labor - Zero-Based

Estimate based on vendor quotations

NSE - Zero-Based

N/A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Sub Details for
Workpaper Group 00774G

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	2 Improving Customer Experience
Workpaper Group	00774G - PT14827 C&I Next Generation Phase I
Workpaper Detail	00774G 001 - C&I Next Generation
In-Service Date	12/31/2015
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	73	201	0
Non-Labor	263	2,252	0
NSE	0	0	0
Total	**336**	**2,453**	**0**
FTE	0 7	2 0	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Group
00774I - PT15802 C&I Next Generation Phase 2 and 3

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	2 Improving Customer Experience
Workpaper Group	00774I - PT15802 C&I Next Generation Phase 2 and 3

Summary of Results (Constant 2013 $ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
Years		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	0	232	232
Non-Labor	Zero-Based	0	0	0	0	0	0	1,510	570
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**	**0**	**1,742**	**802**
FTE	Zero-Based	0 0	0 0	0 0	0 0	0 0	0 0	2 3	2 3

Business Purpose:

This is pilot is to provide field representatives, beginning with Account Executive (Account Representatives), with a mobile enablement tool to increase the effectiveness of customer transactions in face-to-face meetings and site visits

Physical Description:

Create a mobile accessible application to aggregate various enterprise databases and contain robust data retrieval and reporting abilities This will equip Account Representatives with light, portable devices, that can wirelessly connect to company information systems and websites, and include functionalities such as mapping, auditing, reporting, tracking, contracting, and program enrollment applications

Project Justification:

This will introduce new mobile technology to Account Representatives to increase effectiveness of customer interactions, driving higher rates of engagement in various programs and services This will also improve current documentation and information verification processes through data input process standardization

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	2 Improving Customer Experience
Workpaper Group	00774I - PT15802 C&I Next Generation Phase 2 and 3

Forecast Methodology:

Labor - Zero-Based

Estimate based on internal labor hours quotations

Non-Labor - Zero-Based

Estimate based on vendor quotations

NSE - Zero-Based

N/A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Sub Details for
Workpaper Group 00774I

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	2 Improving Customer Experience
Workpaper Group	00774I - PT15802 C&I Next Generation Phase 2 and 3
Workpaper Detail	00774I 001 - Account Executives require wireless access to customer and program information at all t
In-Service Date	12/31/2015
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	0	232	0
Non-Labor	0	1,510	0
NSE	0	0	0
Total	**0**	**1,742**	**0**
FTE	0 0	2 3	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	2 Improving Customer Experience
Workpaper Group	00774I - PT15802 C&I Next Generation Phase 2 and 3
Workpaper Detail	00774I 002 - Account Executives require wireless access to customer and program information at all t
In-Service Date	12/31/2016
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	0	0	232
Non-Labor	0	0	570
NSE	0	0	0
Total	**0**	**0**	**802**
FTE	0 0	0 0	2 3

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Group
00754B - Gas and Electric Harmonization

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00754 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00754B - Gas and Electric Harmonization

Summary of Results (Constant 2013 $ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
Years		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	0	391	0
Non-Labor	Zero-Based	0	0	0	0	0	0	862	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**	**0**	**1,253**	**0**
FTE	Zero-Based	0 0	0 0	0 0	0 0	0 0	0 0	3 8	0 0

Business Purpose:

Support compliance with FERC rule making decision for gas and electric harmonization proposal

Physical Description:

Major system enhancements are required in ENVOY application to maintain coordination with upstream pipelines to maximize natural gas receipts and customer satisfaction as we move to implement a 2 00 a m gas day and 3 intraday cycles

Project Justification:

These are necessary system changes to meet new mandated FERC requirements

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00754 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00754B - Gas and Electric Harmonization

Forecast Methodology:

Labor - Zero-Based

Upgrade and enhance current Envoy application with in house development
The project start date and end dates are not considering any other capital projects that are in progress at the same time Impact analysis will need to perform during the Business Case phase to adjust timeline accordingly

Non-Labor - Zero-Based

Upgrade and enhance current Envoy application with in house development
The project start date and end dates are not considering any other capital projects that are in progress at the same time Impact analysis will need to perform during the Business Case phase to adjust timeline accordingly

NSE - Zero-Based

N/A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Sub Details for
Workpaper Group 00754B

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00754 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00754B - Gas and Electric Harmonization
Workpaper Detail	00754B 001 - Gas and Electric Harmonization
In-Service Date	12/31/2015
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	0	391	0
Non-Labor	0	862	0
NSE	0	0	0
Total	**0**	**1,253**	**0**
FTE	0 0	3 8	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Group
00754C - Low OFO and EFO

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00754 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00754C - Low OFO and EFO

Summary of Results (Constant 2013 $ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
Years		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	0	309	0
Non-Labor	Zero-Based	0	0	0	0	0	0	647	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**	**0**	**956**	**0**
FTE	Zero-Based	0 0	0 0	0 0	0 0	0 0	0 0	3 0	0 0

Business Purpose:

Support compliance with CPUC decisions for changes to Rule 30, Rule 41, and G-IMB tariff Major system enhancements are required in ENVOY and SCBS applications to support Low Operational Flow Order (Low OFO) and Emergency Flow Orders (EFO)

Physical Description:

Eliminate winter balancing events and replace with low operational flow orders (Low OFO) and Emergency Flow Orders (EFO)

Project Justification:

These are necessary system changes for compliance with CPUC decision

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00754 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00754C - Low OFO and EFO

Forecast Methodology:

Labor - Zero-Based

Upgrade and enhance current Envoy and SCBS applications with in house development
The project start date and end dates are not considering any other capital projects that are in progress at the same time Impact analysis will need to perform during the Business Case phase to adjust timeline accordingly

Non-Labor - Zero-Based

Upgrade and enhance current Envoy and SCBS applications with in house development
The project start date and end dates are not considering any other capital projects that are in progress at the same time Impact analysis will need to perform during the Business Case phase to adjust timeline accordingly

NSE - Zero-Based

N/A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Sub Details for
Workpaper Group 00754C

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00754 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00754C - Low OFO and EFO
Workpaper Detail	00754C 001 - Low OFO and EFO
In-Service Date	12/31/2015
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	0	309	0
Non-Labor	0	647	0
NSE	0	0	0
Total	**0**	**956**	**0**
FTE	0 0	3 0	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Group
00766A - PT14869 NAESB EDIX Upgrade

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00766 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00766A - PT14869 NAESB EDIX Upgrade

Summary of Results (Constant 2013 $ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
Years		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	0	262	0
Non-Labor	Zero-Based	0	0	0	0	0	0	24	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**	**0**	**286**	**0**
FTE	Zero-Based	0 0	0 0	0 0	0 0	0 0	0 0	2 6	0 0

Business Purpose:

SoCalGas has Trading Partner agreements with 6 interstate pipelines for gas flow information in order to facilitate the transportation of gas EDIX supports our file transfers with these interstate pipelines using the NAESB (North American Energy Standard Board) version 1 6, which is becoming obsolete
Kinder Morgan, a parent company for El Paso and Mojave is requesting SCG to implement NAESB version 2 0 by 1st quarter 2015 Other Pipelines are also planning for the upgrade between 2014 to 2015 SoCalGas must update our EDI X12 transaction sets to NAESB Version 2 0 to avoid service interuption and impact customers' satisfaction

Physical Description:

Upgrade NAESB version to 2 0 to meet NAESB standard and be able to continue file data transfers with our interstate pipeline companies

Project Justification:

- maintain ability to continue conducting business with interstate pipelines which is critical for gas deliveries
- avoid manual effort (one FTE)
- optimize customer experience as a reliable service provider

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00766 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00766A - PT14869 NAESB EDIX Upgrade

Forecast Methodology:

Labor - Zero-Based

Estimate based on internal labor hours quotations

Non-Labor - Zero-Based

Estimate based on vendor quotations

NSE - Zero-Based

N/A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Sub Details for
Workpaper Group 00766A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00766 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00766A - PT14869 NAESB EDIX Upgrade
Workpaper Detail	00766A 001 - SoCalGas has Trading Partner agreements with 6 interstate pipelines for gas flow inform
In-Service Date	06/30/2015
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	0	262	0
Non-Labor	0	24	0
NSE	0	0	0
Total	**0**	**286**	**0**
FTE	0 0	2 6	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Group
00774K - PT81438 ENVOY MCS DATA CONTROLS

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00774K - PT81438 ENVOY MCS DATA CONTROLS

Summary of Results (Constant 2013 $ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
Years		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	377	217	12
Non-Labor	Zero-Based	0	0	0	0	0	148	400	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**	**525**	**617**	**12**
FTE	Zero-Based	0 0	0 0	0 0	0 0	0 0	3 7	2 1	0 1

Business Purpose:

Implement a set of automated processes to purge expired Envoy and MCS data on an on-going basis to stay in compliance with the guidelines and policies

Physical Description:

Need an automated process to purge data older than the data retention period
Retention period should be configurable based on data type (Customers, Measurements etc) without program changes
Need a review and approval process before any data is purged in Envoy
Enhance the current review and approval process in MCS if needed
Purge should not impact any business functions

Project Justification:

ENVOY and MCS are required to be in compliance with CPUC restrictions on data retention, audit guidelines, and Sempra Record Management Policies through disposal of historical data

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00774K - PT81438 ENVOY MCS DATA CONTROLS

Forecast Methodology:

Labor - Zero-Based

The forecast is based upon the current project timeline

Non-Labor - Zero-Based

The forecast is based upon the current project timeline

NSE - Zero-Based

N/A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Sub Details for
Workpaper Group 00774K

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00774K - PT81438 ENVOY MCS DATA CONTROLS
Workpaper Detail	00774K 001 - ENVOY MCS DATA CONTROLS
In-Service Date	12/31/2014
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	377	0	0
Non-Labor	108	0	0
NSE	0	0	0
Total	**485**	**0**	**0**
FTE	3 7	0 0	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00774K - PT81438 ENVOY MCS DATA CONTROLS
Workpaper Detail	00774K 002 - ENVOY MCS DATA CONTROLS
In-Service Date	12/31/2014
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	0	0	0
Non-Labor	40	0	0
NSE	0	0	0
Total	**40**	**0**	**0**
FTE	0 0	0 0	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	3 Mandated
Workpaper Group	00774K - PT81438 ENVOY MCS DATA CONTROLS
Workpaper Detail	00774K 003 - ENVOY MCS DATA CONTROLS
In-Service Date	01/31/2016
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	0	217	12
Non-Labor	0	400	0
NSE	0	0	0
Total	**0**	**617**	**12**
FTE	0 0	2 1	0 1

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Group
00774B - PT14825 - Email Campaign Management

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	6 Understanding Customers
Workpaper Group	00774B - PT14825 - Email Campaign Management

Summary of Results (Constant 2013 $ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
Years		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	24	143	0
Non-Labor	Zero-Based	0	0	0	0	0	88	933	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**	**112**	**1,076**	**0**
FTE	Zero-Based	0 0	0 0	0 0	0 0	0 0	0 2	1 4	0.0

Business Purpose:

Project will provide tools to create, administer, and track emails and other campaigns to measure their effectiveness and efficiency

Physical Description:

1 Provide tools for creating campaigns - by entering compaign information, applying filters to select customer segments , define deployment date and retrieve data from CIS for running campaign
2 Integrate with internal and external email services (including iContact and verdors such as SilverPop) to send emails to customers
3 Reporting to track campaigns and their benefits/performance

Project Justification:

Increased use of email communications requires a campaign management system to control costs in generating new communication campaigns and ensure effectiveness of email campaigns

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	6 Understanding Customers
Workpaper Group	00774B - PT14825 - Email Campaign Management

Forecast Methodology:

Labor - Zero-Based

Estimate based on internal labor hours quotations

Non-Labor - Zero-Based

Estimate based on vendor quotations

NSE - Zero-Based

N/A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Sub Details for
Workpaper Group 00774B

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	6 Understanding Customers
Workpaper Group	00774B - PT14825 - Email Campaign Management
Workpaper Detail	00774B 001 - Project will provide tools to create administer and track emails and other campaigns
In-Service Date	06/30/2015
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	0	0	0
Non-Labor	0	75	0
NSE	0	0	0
Total	**0**	**75**	**0**
FTE	0 0	0 0	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	6 Understanding Customers
Workpaper Group	00774B - PT14825 - Email Campaign Management
Workpaper Detail	00774B 002 - Project will provide tools to create administer and track emails and other campaigns
In-Service Date	06/30/2015
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	0	0	0
Non-Labor	0	200	0
NSE	0	0	0
Total	**0**	**200**	**0**
FTE	0 0	0 0	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	6 Understanding Customers
Workpaper Group	00774B - PT14825 - Email Campaign Management
Workpaper Detail	00774B 003 - Project will provide tools to create administer and track emails and other campaigns
In-Service Date	06/30/2015
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	24	143	0
Non-Labor	88	658	0
NSE	0	0	0
Total	**112**	**801**	**0**
FTE	0 2	1 4	0 0

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Group
00774A - PT14803 - Envoy Next Generation

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	10 Growth/Capacity
Workpaper Group	00774A - PT14803 - Envoy Next Generation

Summary of Results (Constant 2013 $ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
Years		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	41	348	464
Non-Labor	Zero-Based	0	0	0	0	0	0	1,700	1,200
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**	**41**	**2,048**	**1,664**
FTE	Zero-Based	0 0	0 0	0 0	0 0	0 0	0 9	3 4	4 5

Business Purpose:

Envoy is currently on IE 6 (Internet Explorer 6) which is an obsolete platform This project will upgrade Envoy to current technology platform Envoy public website will be upgraded to meet mandatory accessibility requirements Envoy GUI will be redesigned Selected Envoy services will be implemented on mobile devices Business identified functional improvements will be implemented Security risk Cross Site Reference Forgery (CSRF) will be remediated

Physical Description:

'-Project will upgrade Envoy from IE 6 to industry standard browser or browser independent platform to facilitate customer interaction
-Redesign the Envoy public website for mandatory accessibility compliance (§4 3 of the MOU with the Disability Rights Advocates signed and agreed to during the 2008 GRC)
-Implement selected Envoy services to external customers via mobile device platform(s) including purchase capacity, nominations, meter usage and admin functions
-GUI redesign and help screens
-Functional improvements in Envoy for gas transportation services
-Cross Site Reference Forgery (CSRF) remediation

Project Justification:

- Upgrade Envoy out of obsolete IE6 browser to avoid potential disruption of Envoy services to SoCalGas gas suppliers and customers
- Regulatory compliance with accessibility requirements
- Provide mobile channel for customers as identified in customer satisfaction survey
- Improve usability with GUI redesign and functional improvements as identified in customer satisfaction survey

Note Totals may include rounding differences

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	10 Growth/Capacity
Workpaper Group	00774A - PT14803 - Envoy Next Generation

Forecast Methodology:

Labor - Zero-Based

The forecast is based upon the current project timeline

Non-Labor - Zero-Based

The forecast is based upon the current project timeline

NSE - Zero-Based

N/A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Beginning of Workpaper Sub Details for
Workpaper Group 00774A

Southern California Gas Company
2016 GRC - REVISED
Capital Workpapers

Area	INFORMATION TECHNOLOGY
Witness	Christopher R Olmsted
Budget Code	00774 0
Category	D CS- Information
Category-Sub	10 Growth/Capacity
Workpaper Group	00774A - PT14803 - Envoy Next Generation
Workpaper Detail	00774A 001 - Envoy is currently on IE 6 (Internet Explorer 6) which is an obsolete platform This p
In-Service Date	12/31/2016
Description	

Forecast In 2013 $(000)			
Years	2014	2015	2016
Labor	41	348	464
Non-Labor	0	1,700	1,200
NSE	0	0	0
Total	**41**	**2,048**	**1,664**
FTE	0 9	3 4	4 5

Note Totals may include rounding differences

Exh No:SCG-12-IT Capital Projects										
Witness Name	Ann D. Ayres									
Constant 2013$ in Thousands										
			Adjusted Recorded					Forecast		
Capital Project Name	**WP#**	**Project #**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
SoCalGas ENVOY & MCS Sybase Database Upgrade	00774J	81439						$1,761	$937	
Sub-Total Technical Obsolescence			**$0**	**$0**	**$0**	**$0**	**$0**	**$1,761**	**$937**	**$0**
NAESB EDIX Upgrade	00766A	14869							$286	
SoCalGas ENVOY & MCS Data Controls	00774K	81438						$525	$617	$12
Gas and Electric Harmonization	00754B	00754B							$1,253	
Low OFO and EFO	00754C	00754C							$956	
Sub-Total Mandated			**$0**	**$0**	**$0**	**$0**	**$0**	**$525**	**$3,112**	**$12**
socalgas.com Technology Upgrade	00774C	14829						$1,636	$1,349	
C & I Next Generation	00774G 00774H	14827 15802						$336	$4,195	$802
Sub-Total Improving Customer Experience			**$0**	**$0**	**$0**	**$0**	**$0**	**$1,972**	**$5,544**	**$802**
Email Campaign Management	00774B	14825						$112	$1,076	
Sub-Total Business Understanding Customers			**$0**	**$0**	**$0**	**$0**	**$0**	**$112**	**$1,076**	**$0**
SoCalGas ENVOY Next Generation	00774A	14803						$41	$2,048	$1,664
Sub-Total Business Optimization			**$0**	**$0**	**$0**	**$0**	**$0**	**$41**	**$2,048**	**$1,664**
Other Customer Service projects in IT Capital History			**$1,339**	**$3**	**$898**	**$725**	**$606**			
GRAND TOTAL ALL			**$1,339**	**$3**	**$898**	**$725**	**$606**	**$4,411**	**$12,717**	**$2,478**

Year to Year Explanations:

2009 to 2010

All of the IT Capital spending was related to the Omnibus Implementation project. The Omnibus Implementation project was initiated in accordance with Decision (D.) 07-12-019, which allows SoCalGas/SDG&E to implement a range of revisions to their natural gas operations and offer new services for their core and unbundled storage services. The majority of the capital spending occurred in 2009 with immaterial spending ($3) in 2010.

2011 to 2013

From 2011 to 2013, IT capital spending was attributed to the following capital projects:

In compliance with Decision (D.) 11-02-029, SoCalGas' Electronic Bulletin Board (EBB) system was modified to allow the online purchase of interruptible Off-System Delivery Contract (OSD) capacity and to schedule gas supplies from SoCalGas' city-gate and storage to all various receipt points. Changes were required to the SoCalGas confirmation process and numerous reports and screens. As a result, the Off System (OSD) IT capital project was initiated in 2011, capital spending continued until 2013.

On April 14, 2011, the Commission issued D.11-04-032 adopting operational modifications unanimously recommended by the Joint Parties to the FAR Update Proceeding (A.10-03-028) to reduce scheduling uncertainty and improve operation of the FAR system, including renaming the FAR service tariff from the current G-RPA (Receipt Point Access) to G-BTS (Backbone Transportation Service); and adopting the rate design for G-BTS. As a result, the Firm Access Right (FAR) Update IT capital project was initiated in 2011, capital spending continued until 2013.

The large change from 2013 to 2014 was a result of the initiation of capital expenditure for several IT capital projects. While the 2014 and 2015 forecasts are higher than historical capital spending level, the increase from 2014 to 2015 is primarily driven by the initiation of capital expenditures for several mandated IT capital projects. The reduction from 2015 to 2016 is primarily driven by limiting projects to those with a 2016 in service date.

Other year to year changes of capital spending can be attributed to the annual IT Capital Prioritization Process. As stated by Witness Christopher Olmsted, "Rankings are determined based on various factors including, but not limited to, regulatory requirements, critical service maintenance needs and/or cost benefit analyses." A complete explanation of the IT Capital Prioritization Process can be found in Witness Christopher Olmsted, Ex. SCG-18 pages CRO 20 - CRO 22.

Exh No SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN001.000 - CI-Customer Engagement & Insights										
Labor	1,266	1,912	1,846	1,655	1,543	646	(66)	(191)	(112)	
NLbr	4,386	6,461	5,127	4,612	4,377	2,075	(1,334)	(515)	(235)	
NSE	0	0	0	0	0	0	0	0	0	
2IN001 000 Total	5,651	8,373	6,973	6,267	5,919	2,722	(1,400)	(706)	(348)	Page 89 of 209
Variance Explanation						**Variance Amount**				
2009-10										
Labor										
Labor costs increased due to expanded work associated with project managing MyAccount promotional advertising campaign, redesign of SoCalGas customer bill, and additional research analysis						646				
						646				
NLbr										
MyAccount promotional advertisement campaign						458				
Redesign of SoCalGas customer bill						548				
Refresh of production images & video media to renew expired licensed content						510				
SoCalGas market research studies/subscription renewals						352				
Timing of expenses for general communication campaigns						112				
socalgas com web content translation services and intranet development						95				
						2,075				
						2,721				
2010-11										
Labor										
Labor costs decreased due to salary flucations based on the level of experience of a workforce, the type of work required, and market reference range							(66)			
							(66)			
NLbr										

Exh No SCG-12-WP										
Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN001.000 - CI-Customer Engagement & Insights										
Labor	1,266	1,912	1,846	1,655	1,543	646	(66)	(191)	(112)	
NLbr	4,386	6,461	5,127	4,612	4,377	2,075	(1,334)	(515)	(235)	
NSE	0	0	0	0	0	0	0	0	0	
2IN001 000 Total	5,651	8,373	6,973	6,267	5,919	2,722	(1,400)	(706)	(348)	Page 89 of 209
Variance Explanation						**Variance Amount**				
Timing of expenses for general communication campaigns							12			
Redesign of SoCalGas customer bill							(680)			
MyAccount promotional advertisement campaign							(319)			
Refresh of production images & video media to renew expired licensed content							(605)			
socalgas com web content translation services							374			
SoCalGas market research studies/subscription renewals							(70)			
Vendor and consultant services related to intranet website (internal web) platform refresh.							(46)			
							(1,334)			
							(1,400)			
2011-12										
Labor										
Labor costs decreased due to reduction in project management and advisor activities related to Creative Services media database and media production/campaign design								(191)		
								(191)		
NLbr										
Timing of expenses for general communication campaigns								(479)		
SoCalGas market research studies/subscription renewals								(236)		
Media content production and purchases								164		
Vendor and consultant services related to intranet website (internal web) platform refresh								41		

Note: Totals may include rounding differences.

Exh No SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN001.000 - CI-Customer Engagement & Insights										
Labor	1,266	1,912	1,846	1,655	1,543	646	(66)	(191)	(112)	
NLbr	4,386	6,461	5,127	4,612	4,377	2,075	(1,334)	(515)	(235)	
NSE	0	0	0	0	0	0	0	0	0	
2IN001.000 Total	5,651	8,373	6,973	6,267	5,919	2,722	(1,400)	(706)	(348)	Page 89 of 209
Variance Explanation						**Variance Amount**				
MyAccount promotional advertisement campaign.								(5)		
								(515)		
								(706)		

Note: Totals may include rounding differences.

Exh No.SCG-12-WP										
Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN001.000 - CI-Customer Engagement & Insights										
Labor	1,266	1,912	1,846	1,655	1,543	646	(66)	(191)	(112)	
NLbr	4,386	6,461	5,127	4,612	4,377	2,075	(1,334)	(515)	(235)	
NSE	0	0	0	0	0	0	0	0	0	
2IN001.000 Total	5,651	8,373	6,973	6,267	5,919	2,722	(1,400)	(706)	(348)	Page 89 of 209
Variance Explanation						**Variance Amount**				
2012-13										
Labor										
Labor costs decreased due to reduction in activities related to project management of MyAccount promotional advertisement campaign and socalgas com translation services.									(112)	
									(112)	
NLbr										
MyAccount promotional advertisement campaign									(728)	
socalgas com web content translation services									(324)	
Timing of expenses for general communication campaigns									725	
SoCalGas market research studies/subscription renewals									99	
Media content production and purchases									(7)	
									(235)	
									(347)	

Note: Totals may include rounding differences.

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Exh No SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN002.000 - CI-Customer Assistance										
Labor	167	185	189	179	170	18	4	(10)	(9)	
NLbr	2,224	3,367	3,433	3,404	2,664	1,143	66	(29)	(740)	
NSE	0	0	0	0	0	0	0	0	0	
2IN002 000 Total	2,391	3,552	3,622	3,583	2,834	1,161	70	(39)	(749)	Page 105 of 209
Variance Explanation						**Variance Amount**				
2009-10										
Labor										
Immaterial change in labor costs in Customer Assistance programs, related to typical business fluctuations such as program activity levels						18				
						18				
NLbr										
ESAP-NGAT Additional +29,794 # of treated homes receive NGAT, Additional +$9 73 spent for misc. materials, traveling, expenses						877				
Medical Baseline Incremental expenses accrued biennial for program support which consists of costs for outreach media consulting expenses, advertising, and communication material						240				
Assistance Programs Additional $ spent on Charitable event duplicate payment - $20K + Professional Dues - $10K and lower in other misc - ($4K)						26				
						1,143				
						1,161				
2010-11										
Labor										

Note: Totals may include rounding differences.

Exh No SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN002.000 - CI-Customer Assistance										
Labor	167	185	189	179	170	18	4	(10)	(9)	
NLbr	2,224	3,367	3,433	3,404	2,664	1,143	66	(29)	(740)	
NSE	0	0	0	0	0	0	0	0	0	
2IN002 000 Total	2,391	3,552	3,622	3,583	2,834	1,161	70	(39)	(749)	Page 105 of 209
Variance Explanation						**Variance Amount**				
Immaterial change in labor costs in Customer Assistance programs, related to typical business fluctuations such as program activity levels							4			
							4			
NLbr										
ESAP-NGAT. Additional +20,032 # treated homes receive NGAT, Additional +$10.1 spent for misc materials, traveling, expenses							352			
Medical Baseline Less accrued biennial expenses for program support which consists of costs for outreach media consulting expenses, advertising, and communication material							(232)			
Assistance Programs Spending reduced for Employee meals & events due to credit received in 2011 related to duplicated payment made in 2010 - ($20K), fewer employee expenses - ($29K), and decrease in contribution and dues, and other misc - ($11K)							(54)			
							66			
							70			

Note: Totals may include rounding differences.

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Exh No SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN002.000 - CI-Customer Assistance										
Labor	167	185	189	179	170	18	4	(10)	(9)	
NLbr	2,224	3,367	3,433	3,404	2,664	1,143	66	(29)	(740)	
NSE	0	0	0	0	0	0	0	0	0	
2IN002 000 Total	2,391	3,552	3,622	3,583	2,834	1,161	70	(39)	(749)	Page 105 of 209
Variance Explanation						**Variance Amount**				
2011-12										
Labor										
Immaterial change in labor costs in Customer Assistance programs, related to typical business fluctuations such as program activity levels								(10)		
								(10)		
NLbr										
ESAP-NGAT Less (25,254) # treated homes receive NGAT, less $(4 7) spent for misc materials,								(697)		
ESAP-NGAT Costs for mandatory periodic program assessment audit								263		
Medical Baseline Incremental expenses accrued biennial for program support which consists of costs for outreach media consulting expenses, advertising, and communication material								344		
Assistance Programs. Spending increased in Outreach due to cost mis-charged to Refundable programs in December 2011 and not corrected to O&M till January 2012 - $42K, Cost related to Medical Baseline campaign that should have been charged to Medical Baseline cost center 2200-2035 - $19K, less misc ($1K)								61		
								(29)		
								(39)		
2012-13										
Labor										

Note: Totals may include rounding differences.

Exh No SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN002.000 - CI-Customer Assistance										
Labor	167	185	189	179	170	18	4	(10)	(9)	
NLbr	2,224	3,367	3,433	3,404	2,664	1,143	66	(29)	(740)	
NSE	0	0	0	0	0	0	0	0	0	
2IN002.000 Total	2,391	3,552	3,622	3,583	2,834	1,161	70	(39)	(749)	Page 105 of 209
Variance Explanation						**Variance Amount**				
Immaterial change in labor costs in Customer Assistance programs, related to typical business fluctuations such as program activity levels									(9)	
									(9)	
NLbr										
ESAP-NGAT Less (4,853) # treated homes receive NGAT, less $(2 9) spent for misc. materials, traveling, expenses.									(312)	
ESAP-NGAT. Accrual of mandatory periodic program assessment audit cost from audit activities carried over from previous year									(162)	
Medical Baseline This function was undercharged by ($70k) due to incorrect accounting tag, and the correction is reflected in year 2014 That leaves ($136k) less in expenses accrued biennial for program support which consists of costs for outreach media consulting expenses, advertising, and communication material, balanced with additional expenses for expanded and new targeted advertisement campaigns and communication outreach									(213)	
Assistance Programs Spending decreased due to January 2012 Outreach cost correction - $42K that should have been booked in 2011 and ($19K) reduction related to 2012 Medical Baseline cost center mis-charge, and $10K increase in employee cost.									(53)	
									(740)	
									(749)	

Exh No:SCG-12-WP										
Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN003.000 - CI-Energy Markets & Capacity Products										
Labor	1,865	1,786	1,705	1,689	1,727	(79)	(81)	(16)	38	
NLbr	151	117	93	99	74	(34)	(24)	6	(25)	
NSE						0	0	0	0	
2IN003.000 Total	2,016	1,903	1,798	1,788	1,801	(113)	(105)	(10)	13	Page 79 of 209
Variance Explanation						**Variance Amount**				
2009-10										
Labor										
Labor costs decreased across the business functions that consist of: Energy Markets Account Management, Storage Products and Hub Services, and Energy Markets Staff Support, due to fluctuations driven by work activities tied to completion of regulatory Omnibus Decision, etc						(79)				
						(79)				
NLbr										
Business cost fluctuations (across the business functions that consist of Energy Markets Account Management, Storage products and Hub Services, and Energy Markets Staff Support) consisting of less misc office materials, travel expenses, mileage, software licensing, periodic consulting costs for marketplace evaluation studies						(34)				
						(34)				
						(113)				
2010-11										
Labor										
Labor costs decreased across the business functions that consist of Energy Markets Account Management, Storage Products and Hub Services, and Energy Markets Staff Support, due to fluctuations driven by work activities tied to resource planning							(81)			
							(81)			
NLbr										

Note: Totals may include rounding differences.

Exh No:SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN003.000 - CI-Energy Markets & Capacity Products										
Labor	1,865	1,786	1,705	1,689	1,727	(79)	(81)	(16)	38	
NLbr	151	117	93	99	74	(34)	(24)	6	(25)	
NSE						0	0	0	0	
2IN003 000 Total	2,016	1,903	1,798	1,788	1,801	(113)	(105)	(10)	13	Page 79 of 209
Variance Explanation						**Variance Amount**				
Business cost fluctuations (across the business functions that consist of. Energy Markets Account Management, Storage products and Hub Services, and Energy Markets Staff Support) consisting of less misc office materials, travel expenses, mileage, software licensing, periodic consulting costs for marketplace evaluation studies							(24)			
							(24)			
							(105)			
2011-12										
Labor										
Immaterial change in labor costs across the business functions that consist of Energy Markets Account Management, Storage Products and Hub Services, and Energy markets Staff Support								(16)		
								(16)		
NLbr										
Business cost fluctuations (across the business functions that consist of Energy Markets Account Management, Storage products and Hub Services, and Energy Markets Staff Support) consisting of increased misc office materials, travel expenses, mileage, software licensing, consulting costs, and training costs								6		
								6		
								(10)		

Note: Totals may include rounding differences.

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Exh No SCG-12-WP										
Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN003.000 - CI-Energy Markets & Capacity Products										
Labor	1,865	1,786	1,705	1,689	1,727	(79)	(81)	(16)	38	
NLbr	151	117	93	99	74	(34)	(24)	6	(25)	
NSE						0	0	0	0	
2IN003 000 Total	2,016	1,903	1,798	1,788	1,801	(113)	(105)	(10)	13	Page 79 of 209
Variance Explanation						**Variance Amount**				
2012-13										
Labor										
Labor costs increased across the business functions that consist of: Energy Markets Account Management, Storage Products and Hub Services, and Energy markets Staff Support, due to costs attributed to business fluctuations such as an increase in market and capacity assessments									38	
									38	
NLbr										
Business cost fluctuations (across the business functions that consist of Energy Markets Account Management, Storage products and Hub Services, and Energy Markets Staff Support) consisting of less misc office materials, travel expenses, mileage, software licensing, consulting costs, professional dues, and training costs									(25)	
									(25)	
									13	

Note: Totals may include rounding differences.

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Exh No:SCG-12-WP										
Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN004.000 - CI-Segment Services										
Labor	5,921	5,395	5,350	5,223	4,950	(526)	(45)	(127)	(273)	
NLbr	1,430	1,556	1,300	1,416	1,568	126	(256)	116	152	
NSE	0	0	0	0	0	0	0	0	0	
2IN004 000 Total	7,351	6,951	6,650	6,639	6,518	(400)	(301)	(11)	(121)	Page 27 of 209
Variance Explanation						**Variance Amount**				
2009-10										
Labor						(526)				
Labor costs decreased attributed to fewer large, medium, small, and residential account representative and management service activities										
						(526)				
NLbr										
Timing of charges for expenses associated with external customer events (attendance costs, booth costs, membership fees, etc)						11				
Periodic subscription renewals for market studies and reports						38				
Timing of invoicing for expenses attributed to printing and media development costs						(34)				
Equipment upgrade for the Energy Resource Center ("ERC") seminar and training facilities to support various customer events						92				
Training and seminar events						(3)				
Environmental and air quality research.						22				
						126				
						(400)				
2010-11										
Labor										

Note: Totals may include rounding differences.

Exh No.SCG-12-WP										
Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN004.000 - CI-Segment Services										
Labor	5,921	5,395	5,350	5,223	4,950	(526)	(45)	(127)	(273)	
NLbr	1,430	1,556	1,300	1,416	1,568	126	(256)	116	152	
NSE	0	0	0	0	0	0	0	0	0	
2IN004 000 Total	7,351	6,951	6,650	6,639	6,518	(400)	(301)	(11)	(121)	Page 27 of 209
Variance Explanation						**Variance Amount**				
Labor costs decreased attributed to less program management activities, with salary variances based on experience, work type, and market reference range across the account management and staff business areas							(45)			
							(45)			
NLbr										
Timing of charges for expenses associated with external customer events (attendance costs, booth costs, membership fees, etc)							40			
Periodic subscription renewals for market studies and reports							(105)			
Timing of invoicing for expenses attributed to printing and media development costs							121			
Equipment upgrade for the Energy Resource Center ("ERC") seminar and training facilities to support various customer events							(256)			
Environmental and air quality research.							(85)			
Traveling, mileage, training, telecommunications, professional dues, and misc materials							29			
							(256)			
							(301)			

Note: Totals may include rounding differences.

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Exh No:SCG-12-WP										
Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN004.000 - CI-Segment Services										
Labor	5,921	5,395	5,350	5,223	4,950	(526)	(45)	(127)	(273)	
NLbr	1,430	1,556	1,300	1,416	1,568	126	(256)	116	152	
NSE	0	0	0	0	0	0	0	0	0	
2IN004 000 Total	7,351	6,951	6,650	6,639	6,518	(400)	(301)	(11)	(121)	Page 27 of 209
Variance Explanation						**Variance Amount**				
2011-12										
Labor										
Labor costs decreased attributed to fewer administrative activities related to customer account management and programs implementation, offset with increase in residential account management support								(127)		
								(127)		
NLbr										
Timing of charges for expenses associated with external customer events (attendance costs, booth costs,								(18)		
Periodic subscription renewals for market studies and reports								(22)		
Timing of invoicing for expenses attributed to printing and media development costs								126		
Environmental and air quality research								19		
Traveling, mileage, training, telecommunications, professional dues, and misc materials								11		
								116		
								(11)		
2012-13										
Labor										
Labor costs decreased attributed to fewer codes and standards-operational support of process engineering activities and programs implementation, with offset due to increase in residential and small, medium, business account management support									(273)	
									(273)	
NLbr										

Note: Totals may include rounding differences.

Exh No SCG-12-WP										
Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2IN004.000 - CI-Segment Services										
Labor	5,921	5,395	5,350	5,223	4,950	(526)	(45)	(127)	(273)	
NLbr	1,430	1,556	1,300	1,416	1,568	126	(256)	116	152	
NSE	0	0	0	0	0	0	0	0	0	
2IN004 000 Total	7,351	6,951	6,650	6,639	6,518	(400)	(301)	(11)	(121)	Page 27 of 209
Variance Explanation						**Variance Amount**				
Periodic subscription renewals for market studies and reports									83	
Environmental and air quality research									(57)	
Traveling, mileage, training, telecommunications, professional dues, and misc materials									16	
Equipment upgrade for the Energy Resource Center ("ERC") seminar and training facilities to support various customer events									110	
									152	
									(121)	

Note: Totals may include rounding differences.

Exh No.SCG-12-WP										
Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2200-0246.000 - Energy Markets & Capacity Products - Director										
Labor	233	194	219	225	266	(39)	25	6	41	
NLbr	81	78	64	62	72	(3)	(14)	(2)	10	
NSE	0	0	0	0	0	0	0	0	0	
2200-0246 000 Total	314	272	283	287	338	(42)	11	4	51	Page 39 of 209
Variance Explanation						**Variance Amount**				
2009-10										
Labor										
Labor costs decreased due to business fluctuations which reduced administrative and supervisory management needs						(39)				
						(39)				
NLbr										
Immaterial change in non-labor costs attributed to business fluctuations for misc materials, professional dues, bi-annual software license dues, traveling expenses, contract labor etc						(3)				
						(3)				
						(42)				
2010-11										
Labor										
Labor costs increased due to business fluctuations which increased administrative and supervisory management needs.							25			
							25			
NLbr										
Non-labor costs due to fewer misc materials, professional dues, bi-annual software license dues, traveling expenses, etc							(14)			
							(14)			
							11			

Note: Totals may include rounding differences.

Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2011-12										
Labor										
Immaterial change in labor costs attributed to typical business fluctuations such as salary adjustments corresponding to experience, work volume, and market reference, etc.								6		
								6		
NLbr										
Immaterial change in non-labor costs attributed to business fluctuations for misc materials, professional dues, bi-annual software license dues, traveling expenses, contract labor etc.								(2)		
								(2)		
								4		
2012-13										
Labor										
Labor costs increased due to business fluctuations which increased administrative and supervisory management needs.									41	
									41	
NLbr										
Immaterial change in non-labor costs attributed to business fluctuations for misc materials, professional dues, bi-annual software license dues, traveling expenses, contract labor etc									(10)	
									10	
									51	

Note: Totals may include rounding differences.

Exh No SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2200-0328.000 - Capacity Products Support										
Labor	632	663	553	534	624	31	(110)	(19)	90	
NLbr	17	12	63	22	15	(5)	51	(41)	(7)	
NSE	0	0	0	0	0	0	0	0	0	
2200-0328 000 Total	649	675	616	556	640	26	(59)	(60)	84	Page 52 of 209
Variance Explanation						**Variance Amount**				
2009-10										
Labor										
Labor costs increased in Capacity Products Support due to business fluctuations generated from regulatory compliance requirements						31				
						31				
NLbr										
Cost fluctuation attributed to one less training event over previous year related to adaptation of periodic new regulatory requirements, these costs specific to Omnibus implementation (2009)						(5)				
						(5)				
						26				
2010-11										
Labor										
Labor costs decreased in Capacity Products Support due to business fluctuations generated from regulatory compliance requirements							(110)			
							(110)			
NLbr										
Incremental costs incurred related to adaptation of periodic new regulatory requirements, these costs are specific to external consulting costs related to the Backbone Transmission Service ("BTS") implementation (2011)							51			

Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
							51			
							(59)			
2011-12										
Labor										
Labor costs decreased in Capacity Products Support due to business fluctuations generated from regulatory compliance requirements and gas system regulatory support								(19)		
								(19)		
NLbr										
Less consulting costs related to BTS in prior 2011 year, but incurring additional costs for market research, publication subscriptions for market information, and minor fluctuations in costs for employee travel expenses								(41)		
								(41)		
								(60)		
2012-13										
Labor										
Labor costs increased in Capacity Products Support due to typical business fluctuations such as increased regulatory support to develop proposals and analysis for gas system reliability improvements									90	
									90	
NLbr										
Less costs for market research, combined with increased costs for publication subscriptions for market information, and minor fluctuations in costs for employee travel expenses									(7)	
									(7)	
									83	

Note: Totals may include rounding differences.

Exh No.SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2200-0330.000 - Capacity Products Staff										
Labor	498	567	557	554	516	69	(10)	(3)	(38)	
NLbr	70	75	75	41	23	5	0	(34)	(18)	
NSE	0	0	0	0	0	0	0	0	0	
2200-0330 000 Total	568	642	632	595	539	74	(10)	(37)	(56)	Page 116 of 209
Variance Explanation						**Variance Amount**				
2009-10										
Labor										
Labor costs increased in Capacity Products Staff due to business fluctuations driven by assessment needs, and products & services support						69				
						69				
NLbr										
Incremental online data/subscription cost for market data and analysis and higher traveling expenses incurred						5				
						5				
						74				
2010-11										
Labor										
Labor costs decreased due to business fluctuations driven by assessment needs, and products & services support							(10)			
							(10)			
							(10)			
2011-12										
Labor										

Note: Totals may include rounding differences.

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Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
Immaterial change in labor costs due to business fluctuations driven by assessment needs, and products & services support								(3)		
								(3)		
NLbr										
Decrease of software licensing costs								(47)		
Incremental online data/subscription cost for market data and analysis								13		
								(34)		
								(37)		
2012-13										
Labor										
Labor costs decreased due to business fluctuations driven by assessment needs, and products & services support									(38)	
									(38)	
NLbr										
Decrease of software licensing costs									(18)	
									(18)	
									(56)	

Note: Totals may include rounding differences.

Exh No:SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2200-2158.000 - Gas Scheduling										
Labor	493	529	472	493	543	36	(57)	21	50	
NLbr	51	32	30	18	11	(19)	(2)	(12)	(7)	
NSE	0	0	0	0	0	0	0	0	0	
2200-2158 000 Total	544	561	502	511	554	17	(59)	9	43	Page 116 of 209
Variance Explanation						**Variance Amount**				
2009-10										
Labor										
Labor costs increased in Gas Scheduling group driven by business activity levels which fluctuate based on gas system conditions						36				
						36				
NLbr										
Discontinuation of temporary agency labor services						(19)				
						(19)				
						17				
2010-11										
Labor										
Labor costs decreased driven by business activity levels which fluctuate based on gas system conditions							(57)			
							(57)			
NLbr										
Incremental costs associated with software licensing and maintenance, combined with decrease in costs associated with misc materials, training, and travel expenses							(2)			
							(2)			
							(59)			
2011-12										
Labor										

Note: Totals may include rounding differences.

Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
Immaterial change in labor costs in Gas Scheduling group driven by business activity levels which fluctuate based on gas system conditions.								21		
								21		
NLbr										
Decrease in costs associated with misc materials, training and travel expenses								(12)		
								(12)		
								9		
2012-13										
Labor										
Labor costs increased in Gas Scheduling group driven by business activity levels which fluctuate based on gas system conditions									50	
									50	
NLbr										
Decrease in costs associated with computer hardware and travel expenses									(7)	
									(7)	
									43	

Note: Totals may include rounding differences.

Exh No:SCG-12-WP										
Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2200-2329.000 - Gas Transmission Planning										
Labor	567	537	569	607	567	(30)	32	38	(40)	
NLbr	32	37	35	37	9	5	(2)	2	(28)	
NSE	0	0	0			0	0	0	0	
2200-2329 000 Total	599	574	604	644	576	(25)	30	40	(68)	Page 169 of 209
Variance Explanation						**Variance Amount**				
2009-10										
Labor										
Labor costs decreased driven by business activity levels which fluctuate based on volume of gas system modeling and development studies necessary to respond to market conditions						(30)				
						(30)				
NLbr										
Incremental costs related to misc materials and travel expenses						5				
						5				
						(25)				
2010-11										
Labor										
Labor costs increased driven by business activity levels which fluctuate based on volume of gas system modeling and development studies necessary to respond to market conditions							32			
							32			
NLbr										
Decrease in costs attributed to fluctuations in travel expenses and software licensing							(2)			
							(2)			
							30			
2011-12										
Labor										

Note: Totals may include rounding differences.

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Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
Labor costs increased driven by business activity levels which fluctuate based on volume of gas system modeling and development studies necessary to respond to market conditions								38		
								38		
NLbr										
Incremental costs related to training expenses								2		
								2		
								40		
2012-13										
Labor										
Labor costs decreased driven by business activity levels which fluctuate based on volume of gas system modeling and development studies necessary to respond to market conditions									(40)	
									(40)	
NLbr										
Evaluation of Service studies with fixed cost contracts was credited to Gas Transmission's cost center as a non-labor offset in 2013.									(26)	
Reduction in travel expenses									(2)	
									(28)	
									(68)	

Exh No SCG-12-WP										
Witness Name	Ann D Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
2200-2282.000 - VP Customer Solutions										
Labor	366	362	424	316	229	(4)	62	(108)	(87)	
NLbr	34	276	90	77	36	242	(186)	(13)	(41)	
NSE	0	0	0	0	0	0	0	0	0	
2200-2282 000 Total	400	638	514	393	265	238	(124)	(121)	(128)	Page 176 of 209
Variance Explanation						**Variance Amount**				
2009-10										
Labor										
Immaterial change in labor costs attributed to variation/adjustment in salaries based on level of experience and market reference						(4)				
						(4)				
NLbr										
Incremental expense due to consultation market study						205				
Cost fluctuations attributed to traveling expenses, misc materials, office supplies etc.						37				
						242				
						238				
2010-11										
Labor										
Labor costs increased due to expanded administrative support driven by business activity fluctuations							62			
							62			
NLbr										
Less market study costs, traveling expenses, incremental misc materials, office supplies, etc							(186)			
							(186)			
							(124)			
2011-12										
Labor										
Labor costs decreased due to business fluctuations such as change in administrative work volume								(108)		

Witness Name	Ann D. Ayres									
2013$ in Thousands										
	Adjusted Recorded					Variances by Year				Workpaper Page
	2009	2010	2011	2012	2013	2009-10	2010-11	2011-12	2012-13	
								(108)		
NLbr										
Reduction in travel expenses, misc materials, office supplies, with uptick of spending for temporary agency labor to support administrative work volume during labor vacancy period and $20k consulting study								(13)		
								(13)		
								(121)		
2012-13										
Labor										
Labor costs decreased due to business fluctuations such as change in administrative work volume.									(87)	
									(87)	
NLbr										
Reduction in consulting study ($20k), traveling expenses, misc materials, office supplies, etc									(41)	
									(41)	
									(128)	

Note: Totals may include rounding differences.

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Testimony			Testimony Page #	Workpaper Group	Workpaper Page #	Forecast Methodology Workpapers	Work Group Name	Cost Driver	Total ($000)	Labor ($000)	Non-Labor ($000)	NSE	FTE	Notes
II	B	2	16	2IN001 000	5 - 7	Pages 5-7	Customer Engagement & Insights	5-year average forecast methodology over /(under) 2013 Base Year	717	101	616	-	1 0	5-year average forecast methodology selection is explained in the testimony, SCG-12, Section II, B, 2
II	B	3	18, 19 - 22	2IN001 000	8		Customer Engagement & Insights	Customer Marketing & Communications	167	167	-	-	2 0	Costs based on median of 2013 Market Reference Range ("MRR") for 1 social media Advisor and 1 communications Advisor (This is a subset of the $814k forecast adjustment line item)
II	B	3	18, 19 - 22	2IN001 000	9		Customer Engagement & Insights	Additional engagement and ad campaigns, production of additional video and social media software tools	300	-	300	-	-	Cost estimates developed based on historical, advertising-related spend For safety campaign, an additional $200,000 will extend advertising support to provide for two additional months of activity per year Social media campaigns of approximately $25,000 per campaign would allow us to develop two campaigns, and social media videos of approximately $10,000 per video would allow us to develop about five safety-related videos for use on our YouTube page and website
II	B	3	18, 22 - 23	2IN001 000	8		Customer Engagement & Insights	Customer Insights & Analytics	96	96	-	-	1 0	Costs based on median of 2013 Market Reference Range ("MRR") for 1 research Analyst (This is a subset of the $814k forecast adjustment line item)
II	B	3	18, 22 - 23	2IN001 000	9		Customer Engagement & Insights	Customer Research Online Panel - quantitative research through residential and business online panels	170	-	170	-	-	Cost estimate based on current vendor costs to run our research panels which were established by competitive bid
II	B	3	18, 22 - 23	2IN001 000	8		Customer Engagement & Insights	Qualitative Online Community Research	160	-	160	-	-	Cost estimate established by historical expenses for similar-type activities
II	B	3	18, 22 - 23	2IN001 000	8		Customer Engagement & Insights	Business email and phone # database	30	-	30	-	-	Cost based on vendor estimate to append emails and phone numbers to our business customer database Costs were based on per file fees plus $ 08 per email append (to append 2-4x annually) and for phone per file fee plus $9 50 per thousand appended (to append 2-4x annually)
II	B	3	18, 22 - 23	2IN001 000	8		Customer Engagement & Insights	Survey content for mobile channels	80	-	80	-	-	Cost estimate developed based on market research industry average costs qualitative research $25,000/ quantitative research $55,000
II	B	3	18, 22 - 23	2IN001 000	8		Customer Engagement & Insights	Mobile/social-media research - CES expansion to include social media surveys	150	-	150	-	-	Estimated cost developed based on average vendor estimates for similar type ongoing transactional research activities in other areas, taking under consideration quantitative study expenses of $15,000 for design, $30,000 for development & implementation, and $105,000 to operate and maintain annually
II	B	3	18, 22 - 23	2IN001 000	8		Customer Engagement & Insights	Customer behavioral data collection and analysis	120	-	120	-	-	Cost estimated based on a scaled derivation of a comparable historical research activity
II	B	3	18, 23 - 25	2IN001 000	8		Customer Engagement & Insights	Creative Services	179	179	-	-	2 0	Costs based on median of 2013 Market Reference Range ("MRR") for 1 community outreach Advisor and 1 creative services Assist Advisor (This is a subset of the $814k forecast adjustment line item)

Testimony			Testimony Page #	Workpaper Group	Workpaper Page #	Forecast Methodology Workpapers	Work Group Name	Cost Driver	Total ($000)	Labor ($000)	Non-Labor ($000)	NSE	FTE	Notes
II	B	3	18, 23 - 25	2IN001 000	9		Customer Engagement & Insights	Media messages, promotional materials and booth costs for regional/local events for hard-to-reach community	150	-	150	-	-	Cost estimates developed based on assumptions for travel & business tools (estimate 350 miles of business mileage, 1/month overnight hoteling cost based on expanse of SoCalGas territory, laptop/mobile phone = total $17,000), targeted research ($15,000), historical expenses for promotional collateral ($15,000), design and print of communication materials ($20,000), and sponsorship and booth fees for community outreach events ($50,000), as well as vendor provided estimates for exhibit and display equipment and material ($33,000)
II	B	3	18, 25 - 30	2IN001 000	8		Customer Engagement & Insights	eServices & Data Analysis	372	372	-	-	4 0	Costs based on median of 2013 Market Reference Range ("MRR") for 1 e-service designer Advisor, 2 e-service Analyst/senior Analyst, and 1 web editor Advisor (This is a subset of the $814k forecast adjustment line item)
II	B	3	18, 25 - 30	2IN001 000	8		Customer Engagement & Insights	Mobile applications annual maintenance	215	-	215	-	-	Cost estimate based on historic annual spend required for a mobile awareness campaign that includes purchase of online advertising $140,000, google ad-words $40,000 and deploy 2 email campaigns @ $10,000 each (total $200,000), and $15,000 for mobile application support based on estimated costs to update both iPhone and Android applications for new operation system versions @ $125 00/hour-of-contracted-work (market rate for applications developer) * 60 hours of work *2 applications
II	B	3	18, 25 - 30	2IN001 000	8		Customer Engagement & Insights	Annual socalgas com refresh expenses	5	-	5	-	-	Cost estimate for content conversion estimated at 60 hours of work * $85/hour-of-contracted-work
II	B	3	18, 25 - 30	2IN001 000	8		Customer Engagement & Insights	Intranet gaslines com platform annual maintenance	60	-	60	-	-	Cost estimate developed based on 18 weeks of work at current rate of $85/hour-of-contracted-work
							Sub-Total		**2,971**	**915**	**2,056**	**-**	**10.0**	
II	C	2	33 - 34	2IN002 000	67 - 68	Pages 67-68	Customer Assistance	5-year average forecast methodology over /(under) 2013 Base Year	362	8	354	-	0 2	5-year average forecast methodology selection is explained in the testimony, SCG-12, Section II, C, 2
II	C	3	34 - 36	2IN002 000	68 - 69, 105		Customer Assistance	Natural Gas Appliance Testing (NGAT)	807	-	807	-	-	Incremental costs are the delta of (the 5-year historical average expense) and (the 2016 expense derived based on a forecasted number of treated homes anticipated in 2015-2017 Low Income Proceeding application, anticipated % of homes treated, and forecasted cost-per-unit based on market indications) See SCG-12-WP page 105 for calculation details
II	C	3	34, 36 - 37	2IN002 000	69		Customer Assistance	Medical Baseline - outreach and education	230	-	230	-	-	Cost estimates developed based on assumptions for travel & business tools (estimate 350 miles of business mileage, 1/month overnight hoteling cost based on expanse of SoCalGas territory, laptop/mobile phone - $17,000), and historical expenses for similar targeted activities to provide translation, design, print of communication educational materials, community outreach event exhibit and display equipment and materials, and training resources for CBOs

Testimony			Testimony Page #	Workpaper Group	Workpaper Page #	Forecast Methodology Workpapers	Work Group Name	Cost Driver	Total ($000)	Labor ($000)	Non-Labor ($000)	NSE	FTE	Notes
II	C	3		2IN002.000	69		Customer Assistance	Medical Baseline - research and analysis	20	-	20	-	-	Cost estimate based on historical research and analysis expenses for other similar in scope activities
							Sub-Total		**1,419**	**8**	**1,411**	**-**	**0.2**	
II	D	1	45	2IN003 000	116-117	Pages 116-117	Energy Markets & Capacity Products	5-year average forecast methodology over /(under) 2013 Base Year	60	27	33	-	0 4	5-year average forecast methodology selection is explained in the testimony, SCG-12, Section II, D, 1, b
II	D	1	46 - 47	2IN003 000	117		Energy Markets & Capacity Products	Energy Markets Account Management	109	109	-	-	1 0	Costs based on median of 2013 Market Reference Range ("MRR") for 1 Account Manager (account representative)
II	D	1	46 - 47	2IN003 000	117		Energy Markets & Capacity Products	Energy Markets Staff Support	109	109	-	-	1 0	Costs based on median of 2013 Market Reference Range ("MRR") for 1 senior market Advisor
							Sub-Total		**277**	**244**	**33**	**-**	**2.4**	
II	D	2	55	2IN004 000	165-166	Pages 165-166	Segment Services	5-year average forecast methodology over /(under) 2013 Base Year	304	418	(114)	-	4 3	5-year average forecast methodology selection is explained in the testimony, SCG-12, Section II, D, 2, b.
II	D	2	56 - 58	2IN004 000	168		Segment Services	Small/Medium Business (SMB) Support Services	508	508	-	-	5 0	Costs based on median of 2013 Market Reference Range ("MRR") for 1 Business Manager, and 4 Account Representatives
II	D	2	56 - 58	2IN004 000	167		Segment Services	SMB market research	63	-	63	-	-	Costs based on vendor provided research estimate and comparable historical research expenses for other focused studies
II	D	2	56 - 58	2IN004 000	168		Segment Services	SMB education and outreach materials	50	-	50	-	-	Estimated costs based on historical expenses for design and print of communication materials, and SMB community outreach such as travel expenses, mileage, etc
II	D	2	56, 58 - 59	2IN004 000	167		Segment Services	Residential Services	217	217	-	-	2 0	Costs based on median of 2013 Market Reference Range ("MRR") for 2 Project Managers (This is a subset of the $591k forecast adjustment line item)
II	D	2	56, 58 - 59	2IN004 000	167		Segment Services	Residential Services - contract labor, market research, web changes, communication and promotional materials	350	-	350	-	-	Market research (based on industry average costs) $40,000/study (quantitative and qualitative) x 4 studies, one per new residential service improvement initiative (example such as improved start/transfer transaction) = $160,000 Web updates (eg landing page to educate on a new initiative - based on industry average costs) 80 hours/landing page of contract creative/programming time *$100/hour = $8,000/landing page x 4 new initiatives= $32,000 Promotional materials (mailers and relevant brochures - based on industry average costs) $20,000/targeted campaign * 4 campaigns = $80,000 Contract labor (basic logistics, support) 2 people at $60/hour * 650 hours = $78,000
II	D	2		2IN004 000	167		Segment Services	Residential Services - annualize labor function attributed to new activities added partial year in 2013	29	29	-	-	1 3	These numbers are derived based on the expenses for new residential services activities that were added mid year 2013, annualized for a full year's worth activity equivalent that are above and beyond the 5-year base methodology (This is a subset of the $591k forecast adjustment line item)

Testimony			Testimony Page #	Workpaper Group	Workpaper Page #	Forecast Methodology Workpapers	Work Group Name	Cost Driver	Total ($000)	Labor ($000)	Non-Labor ($000)	NSE	FTE	Notes
II	D	2	56, 58 - 59	2IN004 000	168		Segment Services	Residential Services - communications materials to support Customer Service Field safety check enhanced outreach and education	200	-	200	-	-	Calculated estimate based on percentage targeted residential population x assumed response rate x direct mailer expenses + design cost + e-channel outreach efforts
II	D	2	56, 58 - 59	2IN004 000	168		Segment Services	Residential Services - communications materials to support Customer Service Field CO detector and socalgas.com enhanced outreach and education	92	-	92	-	-	Calculated based on estimate of (2 pamphlet printouts * (875,000 count distributed * $0 05 print cost+ $2,150 design cost)) = $92,000
II	D	2	56, 59 - 60	2IN004 000			Segment Services	Clean Energy Builder Services	345	345	-	-	3 0	Costs based on median of 2013 Market Reference Range ("MRR") for 1 Project Manager, 1 market Advisor, and 2 Interns (This is a subset of the $591k forecast adjustment line item)
II	D	2	56, 59 - 60	2IN004 000	167		Segment Services	Clean Energy Builder Services - contract labor, market research, web changes, communication and promotional materials	340	-	340	-	-	Market research (based on industry average costs) $90,000 for annual surveys of consumer home comfort and appliance preferences and builder satisfaction/awareness of SCG builder services Builder outreach materials (educational videos, seminars and collateral) - based on agency estimates of video production (3-5 educational videos), seminar outreach materials (mailers, printing costs for 3-5 seminars) and educational collateral $62,000 Contract labor (project management support, based on agency estimates) 2 people @ $75/hour * 1,250 hours = $188,000
II	D	2	56, 60 - 62	2IN004 000	167 - 168		Segment Services	Segment Services	97	97	-	-	1 3	Costs based on median of 2013 Market Reference Range ("MRR") for 1 technical Advisor $75k and 1 intern $22k
II	D	2	56, 60 - 62	2IN004 000	167 - 168		Segment Services	Combined Heat and Power (CHP) marketing tools, technology and service brochures, technical seminars	300	-	300	-	-	Calculated estimate based on industry standard /historical costs/agency estimates for design and print of technology educational communication materials, video production $40,000, development and design of website landing pages (80 hours/landing page of contract creative/programming time * $100/hour = $8,000/landing page* 2 pages = $16,000), development and design of an online evaluation tool $74,000, CHP seminars $10,000, travel/mileage/industry association dues/conferences/outreach events $10,000, and contracted labor for project management support, based on agency estimates @$75/hour * 2000 hours = $150,000
							Sub-Total		**2,895**	**1,614**	**1,281**	**-**	**16.9**	
Total Non-Shared Services									**7,562**	**2,781**	**4,781**	**-**	**29.5**	
III	B	2	67	2200-0246	281	Page 281	Energy Markets & Capacity Products - Director	5-year average forecast methodology over /(under) 2013 Base Year	(40)	(39)	(1)	-	(0 4)	5-year average forecast methodology selection is explained in the testimony, SCG-12, Section III, B, 2
							Sub-Total		**(40)**	**(39)**	**(1)**	**-**	**(0.4)**	

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Details by Workgroup

Testimony			Testimony Page #	Workpaper Group	Workpaper Page #	Forecast Methodology Workpapers	Work Group Name	Cost Driver	Total ($000)	Labor ($000)	Non-Labor ($000)	NSE	FTE	Notes
III	B	2	67	2200-0328	291	Pages 288, 291	Capacity Products Support	5-year average forecast methodology over /(under) 2013 Base Year	(12)	(23)	11	-	(0 3)	5-year average forecast methodology selection is explained in the testimony, SCG-12, Section III, B, 2
III	B	3	68	2200-0328	291		Capacity Products Support	Expanded capacity products supports	109	109	-	-	1.0	Costs based on median of 2013 Market Reference Range ("MRR") for 1 Advisor
							Sub-Total		**97**	**86**	**11**	**-**	**0.7**	
III	B	2	67	2200-0330	296	Page 296	Capacity Products Staff	5-year average forecast methodology over /(under) 2013 Base Year	57	23	34	-	0 2	5-year average forecast methodology selection is explained in the testimony, SCG-12, Section III, B, 2
							Sub-Total		**57**	**23**	**34**	**-**	**0.2**	
III	B	2	67	2200-2158	303 - 304	Pages 303-304, 307	Gas Scheduling	5-year average forecast methodology over /(under) 2013 Base Year	(20)	(37)	17	-	(0 3)	5-year average forecast methodology selection is explained in the testimony, SCG-12, Section III, B, 2
III	B	3	68	2200-2158	291		Gas Scheduling	New business functions related to Envoy Next Generation, Envoy and MCS Database, California Producer Envoy, Low OFO/EFO and Gas and Electric Harmonization systems	192	192	-	-	2 0	Costs based on median of 2013 Market Reference Range ("MRR") for 2 Advisors
							Sub-Total		**172**	**155**	**17**	**-**	**1.7**	
III	B	2	67	2200-2329	314	Page 314	Gas Transmission Planning	5-year average forecast methodology over /(under) 2013 Base Year	23	2	21	-	(0 7)	5-year average forecast methodology selection is explained in the testimony, SCG-12, Section III, B, 2
							Sub-Total		**23**	**2**	**21**	**-**	**(0.7)**	
III	C	2	69	2200-2282	321	Page 321	VP Customer Solutions	5-year average forecast methodology over /(under) 2013 Base Year	177	110	67	-	0 9	5-year average forecast methodology selection is explained in the testimony, SCG-12, Section III, C, 2
							Sub-Total		**177**	**110**	**67**	**-**	**0.9**	
Total Shared Services									**486**	**337**	**149**	**-**	**2.4**	
Total NSS + USS									**8,048**	**3,118**	**4,930**	**-**	**31.9**	

Area: CS - INFORMATION
Witness: Ann D. Ayres

Appendix A: List of Non-Shared Cost Centers

Cost Center	Sub	Description
2200-0177	000	CODES & STANDARDS MANAGER
2200-0229	000	COMMERCIAL & INDUSTRIAL MARKETS DIRECTOR
2200-0230	000	COMM/IND SERVICES EAST MANAGER
2200-0231	000	COMM/IND SERVICES NORTH MANGER
2200-0232	000	COMM/IND SERVICES SOUTH MANAGER
2200-0236	000	FEDERAL TURNKEY PROGRAM
2200-0248	000	ENERGY MARKETS ACCOUNT MANAGER AA
2200-0249	000	ENERGY MARKETS ACCOUNT MANAGER AB - USS
2200-0250	000	ENERGY MARKETS ACCOUNT MANAGER AC
2200-0251	000	ENERGY MARKETS ACCOUNT MANAGER AD
2200-0327	000	STORAGE PRODUCTS MANAGER
2200-0356	000	CARE
2200-0402	000	ENERGY SAVINGS ASSISTANCE PROGRAM
2200-0422	000	SCG MARKET SERVICES
2200-0424	000	NEW CONTRUCTION MGR
2200-0428	000	RESEARCH
2200-0429	000	SMALL C&I SEGMENT MGR
2200-0843	000	NSS - FEDERAL PROJ CUST SERVICE MGR.
2200-2032	000	SPECIAL PROGRAMS DIRECTOR (SCG)
2200-2033	000	CUSTOMER ASSISTANCE PROGRAM LEVERAGING
2200-2034	000	CAM-PROGRAM SUPPORT
2200-2035	000	CAM MEDICAL BASELINE
2200-2037	000	RESOURCE PLANNING - SCG
2200-2048	000	POLICY & SUPPORT
2200-2057	000	VP CUSTOMER SOLUTIONS
2200-2060	000	COMMERCIAL/INDUSTRIAL GAS MARKETS MANAGE
2200-2061	000	MAJOR CUSTOMER INDUSTRIAL SERVICE MANAGE
2200-2076	000	MARKETING & RESEARCH
2200-2087	000	FEDERAL ACCOUNTS DIRECTOR
2200-2100	000	COMMERCIAL/INDUSTRIAL WEST MANAGER
2200-2118	000	ASSISTANCE PROGRAMS
2200-2136	000	C & I OTHER
2200-2143	000	E-SERVICES & DATA ANALYSIS
2200-2146	000	REF ENERGY MKTS & CAPACITY PRODUCTS DIR
2200-2177	000	DIR CUSTOMER PROGRAMS & ASSISTANCE
2200-2187	000	ENERGY MARKETS ACCOUNT MANAGER AB-NSS
2200-2188	000	CUSTOMER COMMUNICATIONS & SOCIAL MEDIA
2200-2193	000	ENERGY EFFICIENCY PARTNERSHIP MANAGER
2200-2194	000	NEW CONSTRUCTION SEGEMENT MANAGER
2200-2205	000	ENERGY EFFICIENCY NEW CONSTRUCTION
2200-2215	000	DIRECTOR-CUSTOMER COMMUNICATIONS
2200-2234	000	TECHNICAL SUPPORT
2200-2238	000	CODES & STANDARDS
2200-2287	000	CALIFORNIA SOLAR INITIATIVE/SGIP
2200-2320	000	IDENTITY & CREATIVE SERVICES

Area: CS - INFORMATION
Witness: Ann D. Ayres

Appendix A: List of Non-Shared Cost Centers

Cost Center	Sub	Description
2200-2321	000	WEB TEAM
2200-2326	000	ENERGY EFFICIENCY ADMINISTRATIVE COST
2200-2327	000	ENERGY EFFICIENCY MARKETING COSTS
2200-2328	000	ENERGY EFFICIENCY DIRECT IMPLEMENT COST
2200-2351	000	CUSTOMER COMMUNICATIONS
2200-2519	000	PROGRAM DEVELOPMENT AND STRATEGY