April 24th, 2020 – SoCalGas RD&D Workshop
Stakeholder Submitted Comments

Brandon Iglesias
Reactwell, L.L.C.

1. Consider funding research projects that convert carbon dioxide green house gas into hand sanitizer, such that organizations with kitchens and food preparation services that depend upon natural gas to power their cooking appliances can then upcycle the carbon dioxide into hand sanitizer for clean and sanitary food preparation services without increasing the economic burden on their businesses and facilities. Our team has been prototyping a continuous hand sanitizer dispenser based upon our voltanol carbon nanospike material science innovation to address this need. We would welcome the opportunity to help your customer base stay healthy and serve products to help keep them working in clean and safe environments upcycling carbon dioxide. This would be a device that plugs into a wall outlet 15 amp and produces hand sanitizer at point of use in buildings that at times have 100 or so devices, where said facilities management and restocking is an issue of small inventory dispensers. The prototyping work would be performed at LACI in downtown Los Angeles, CA and in New Orleans, LA.

2. Consider funding research projects that convert carbon dioxide green house gas into sanitizer products, bulk basis. Such that large facilities that run HVAC systems and heating systems can upcycle the carbon dioxide emissions into sanitizer for building cleaning and spray treatment. Therefore, reducing their economic burden due to COVID-19 by upcycling a concentrated carbon dioxide source directly into a useful on-site cleaning product that reduces their business costs going forward for safe & clean work environment as well as upcycling carbon dioxide. Our team would welcome the opportunity to help your customer base generate cleaning and sanitization fluids based upon upcycling carbon dioxide and is currently working on a bulk sanitizer based upon upcycling carbon dioxide for building cleaning. We are now in discussions with an NFL stadium owner, hospital system, food preparation site, medical clinic and dentist association. The prototyping work would be performed at LACI in downtown Los Angeles, CA and in New Orleans, LA.

Laura Roughton

Hello,
I am so appreciative of Lea Peterson's invitation to attend the 2020 SoCal Gas RD&D Workshop. Although I do not have a background in Gas, I am an involved community member and past Mayor and City Council Member in Jurupa Valley. Much of what was shared during the Workshop was over my head you might say, but there was information about your past and forward thinking goals that I found interesting and peaked my curiosity about the world of Gas. I also appreciated the explanation of acronyms throughout the presentation.

Just a couple of thoughts:
One of the topics spoken about had to do with equity and inclusion specifically with disadvantaged communities (DAC). During my time on City Council, I served on the OWOW (One Water One Watershed) Steering Committee under SAWPA (Santa Ana Watershed Project Authority) during their most recent Plan update. There was a working group with special funding allocated that addressed DAC and developed strategies during our Plan update. I think you would receive beneficial information by contacting Rich Haller at SAWPA for details.

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There was a question asked about other groups to speak with. Depending which area/s you want to share, I suggest any of the COG'S (Councils of Governments) such as WRCOG, SBCOG, etc. Of course SAWPA as I mentioned above and any of their appropriate sub-committees. And then for things in the area of Customer end-use or even exciting developments in the world of Gas, I suggest speaking at Chamber of Commerce meetings or possibly even Rotary or Lions Club meetings. These are places where you will find you local leaders who can then share the information in their public circles. Jurupa Valley as well as other cities have a Healthy City Initiatives. Healthy Jurupa Valley holds a monthly collaborative meeting as well as five community-led Action Teams meetings which would be good opportunities to share your message and cutting edge projects. I was surprised by how many different areas your are involved with and I think others would be as well.

I'll be honest. I was only going to tune in to the first session of the Workshop to get an overview but it was interesting to me even as a lay person and I stayed on pretty much through the whole event.

Thank you for providing a resource that we take for granted every day and for allowing me to learn more about the world of Gas.
Sincerely,
Laura Roughton

Daphne D'Zurko
Executive Director, NYSEARCH
Vice President, RD & D
Northeast Gas Association

To Whom It May Concern:
As a partner and collaborator with SoCal Gas' RD & D department,
I wanted to provide feedback for SoCal Gas related to the 2020 RD & D Workshop that
I attended last Friday April 24.

Our (21) members in the voluntary NYSEARCH RD & D collaborative that
service LDCs in N. America and our NYSEARCH Staff agree
that SoCal Gas R & D Staff and their integrated Subject Matter Experts have
lead the industry in many areas of innovation and best practices that
come from a robust R & D program.

In particular, they have lead many design, development and research data assessments
and have hosted and critiqued many important live field tests for several of our NYSEARCH
programs going back to the early 2000s.

Just focusing on the last few years, SoCal Gas has been a leader in the areas of pipeline
inspection/integrity and has been a key stakeholder and leader for the
commercialization of our EXP series of Robotic Inspection Platforms and related sensors and
enhancements (such as Energy Harvesting which was featured in their 2020 report).
Also they have lead or have provided key feedback in projects that
improve Safety or work toward reduction of emissions and low carbon/de-carbonization.
Examples of safety-related projects are Non-Destructive Evaluation of Plastic Pipe materials
and innovative PE Pipe Location projects. Further, as the greater industry

moves toward what SoCal has been working on in de-carbonization, they are helping to lead discussions now in renewable energy projects. For our collaborative, we have new and ongoing projects that particularly address emerging RNG technologies or issues for LDCs in this space.

We value our relationship and applaud SoCal's RD & D staff and diverse program portfolio. We look forward to continued collaboration.

Praveen Cheekatamarla
Oak Ridge National Lab

The webinar was quite interesting and informative! It gave a good overview of the full breadth of RDD areas SoCalGas is looking at.

Here are some quick thoughts and feedback on additional RDD areas

1. Previously I worked with major upstream and midstream gas companies and one of the major observations was the methane leak during operations. Methane abatement was big on radar (4 years ago) and I believe that is still one of the major concerns associated with natural gas. Fugitive methane from pneumatic controllers was a major contributor for which a low cost gas fired power generation device was sought. EPA estimates ~48BcF of Methane release annually
2. We work with a food service equipment manufacturer on a project. In our preliminary discussions, it seems like there is lot of opportunity in decreasing the stand-by load as well as emissions suppression.
3. Waste heat utilization via thermo-chemical energy storage or electric power generation
4. Source CO2 capture and conversion to value added chemicals
5. Utilization of solid carbon (generated from pyrolysis of natural gas) for battery electrodes

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Daniel S. LeFevers
Director, State and Consumer Programs
Gas Technology Institute

The Gas Technology Institute (GTI) strongly supports SoCalGas' proposed 2021 research, development and deployment (RD&D) program, as outlined in the April 24, 2020 workshop. The RD&D program provides substantial benefits to California energy consumers through the development and testing of new technologies that improve efficiency, reduce emissions, address climate change, and support energy system safety, reliability and resilience while also ensuring continued reasonable energy costs to consumers.

Specifically, the redesign of the program, which increases focus on reducing GHG emissions to address the climate goals of California through program areas including Low Carbon Resources, Clean Transportation, Clean Generation and Customer End-Use Applications, are setting the standard for natural gas utilities throughout the country, creating and testing new technologies, and leading the way to a new low carbon energy future.

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The addition of renewable and low carbon gases into the natural gas system through deployment of technologies like power-to-gas, and the repurposing of waste CO2 will be critical to reaching the State's decarbonization goals. SoCalGas through their RD&D program is developing the techniques, testing, and technologies to ensure that the use of cleaner lower carbon gases and elimination or reuse of CO2 will be safe and affordable. The existing gaseous storage and distribution infrastructure can play a critical long-term role as a cost-effective means for utilization of excess renewable energy represented in the "duck curve".

Another important aspect of the SoCalGas' RD&D program is the ongoing coordination with the RD&D programs of the California Energy Commission (CEC), California air agencies and universities, GTI, the U.S. Department of Energy, and many other research organizations in, and outside of California. This coordination leads to leveraged funding and assists in finding demonstration sites and project participants to validate advanced technologies. SoCalGas' engagement significantly influences the actions of other energy delivery operators throughout the world and works to ensure that new technologies are quickly accepted in the marketplace to benefit energy consumers. California natural gas ratepayers' dollars are highly leveraged to support these critical RD&D initiatives that result in technologies and approaches that increase efficiency and safety while improving the environment. SoCalGas is also in a unique position to understand the integration of renewables and low carbon gases into the gas distribution system and how technologies like hybrid gas/electric equipment and solar can augment homes and businesses to reach zero net energy status. Understanding how to use the natural gas system to deliver a low carbon energy future will be the cornerstone of California reaching its GHG reduction goals. The SoCalGas RD&D program is designed to deliver the reliability and safety coupled with lower carbon energy molecules and advanced technologies to ensure energy consumers will play an integral part in helping the State meet its climate goals.

Additionally, during this time of transition to new and lower carbon energy, RD&D regarding issues of pipeline safety, natural gas system reliability, and advanced leak detection are important to ensure California's natural gas infrastructure can deliver lower carbon results for energy consumers. A robust SoCalGas managed RD&D program focused, in part, on these issues benefits from the vast experience of the company's employees and from a network of other RD&D programs, commercial companies, and California Universities that bring needed expertise into the program for the benefit of California energy consumers. The SoCal Gas RD&D program also funds projects at every stage of technology development where gaps may exist in other RD&D programs. These efforts ensure that important technologies that address the RD&D needs of the program can reach commercialization.

SoCalGas RD&D has also been critical to the development of many of the Near Zero Emission (NZE) engines brought to market over the last few years, through the Clean Transportation RD&D program. Most of these engines being operated in California today, are now fueled with renewable natural gas (RNG). This results in major reductions in conventional criteria pollutants like NOx and PM 2.5 along with substantial reductions in GHG emissions over their diesel and gasoline counterparts.

GTI continues to support and value the SoCalGas RD&D program and we look forward to participating as a performer, co-funder and augmenter of the program. GTI believes that the SoCalGas RD&D program is critical to meeting California's energy, economic and environmental goals and to providing benefits to California's energy consumers.

Crystal Yeh

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Pearlie Sabino
Regulatory Analysts
Public Advocates Office – ECOSNG Branch
California Public Utilities Commission

The participants from the Public Advocate Office respectfully make the brief comments on the above RD&D Workshop below:

The RD&D Program Workshop lacks information on how it decides on the Funding Allocation across the 5 main Programs, including the amount spent on Management/Administration. The information provided in the Workshop indicates that the 2019 spending had the following breakdown: 6% on Admin, 27% on Gas Operations, 39% on Low Carbon Resources, 14% on Customer End-Use, 6% on Clean Generation, and 8% on Clean Transportation. Further, for the years 2020 and 2021, the Workshop indicates that the funding allocation will be: 10% on Admin, 22% on Gas Operations, 33% on Low Carbon Resources, 13% on Customer End-Use, 10% on Clean Generation, and 12% on Clean Transportation. However, no information was provided on the decision criteria to arrive at the funding allocation to enable the participants to determine the appropriateness of the allocations made. It is suggested that the RD&D program be more transparent on how it arrives at the program funding allocation from year to year and whether it is the RD&D program administrator who decides the funding allocation.

Renee Guild
Senior Analyst, Gas Policy & Reliability, Energy Division

1. Why did SoCalGas' 2019 spending decrease from your forecast approved in Sempra GRC 19-09-051 from $14.329 million to $13.142 million?
a. Which sub-program areas were decreased?
b. Where is the $1.187 million difference being utilized or accounted for?
c. Why was the total authorized budget not utilized?

2. Why did spending for Customer End-Use Applications decrease from 16% of SoCalGas' budget in 2018 to 14% in 2019 and 13% in 2020?

3. In 2018, SoCalGas' spending on "Program Wide Partnerships" was $2,702,278 or 21% of your budget. You explained in the workshop call that these partnerships had been allocated to the various research projects in which you participate as part of the research consortiums you are part of and are no longer separately identified in your budget or in the 2019 Report. For each of these consortiums, (GTI, PRCI, NYSearch, UCI Clean Energy Research Center, etc.) please identify the total amount of your 2019 and proposed 2020-2021 budget you are spending with these partnerships and which projects they are supporting, with the amount of your contribution for each project, as you identified in the 2018 Report.

4. The new sub-program headings seem helpful; please reflect them in the headers on each page of the 2020 Report's Appendix, as they were in the 2018 Report. They are not so displayed in the 2019 report.

5. Please identify which projects are specifically related to your methane abatement efforts in the Gas Operations section of your 2020 & 2021 RD&D proposed budgets and which Best Practices in SoCalGas' and SDG&E's 2020 Leak Abatement Compliance Plans they are intended to affect.

6. Methane capture and other technologies that reduce utilization of NG via renewables or energy efficiency at food processing facilities is important, given that food processing is a major industry in California. Increasing funding for such projects should be considered.

7. There were several excellent points made by the representatives of UC Irvine who spoke during the workshop that bear emphasizing:
a. Since SoCalGas' role in increasing the utilization of renewable gas into the system is critical, the balance of RD&D funding between integration of renewable gas and distributed generation seemed to be on the high side for DG (3/4) and not enough for integration (1/4).
b. Additionally, the overall funding for these two categories seems small at $2 million.
c. Research into how storage facilities can accommodate hydrogen should be a priority for SoCalGas, given its large storage resources.

8. The "Go to Meeting" technology did not allow participants in the workshop to easily contribute their thoughts and remarks. I was frustrated not to be able to be heard at several points in the workshop and also to not hear others who had their hands raised, such as Laurie ten Hope and others at the CEC. While it's understandable that you may have not had much practice in using such platforms, in future, please do some test-runs with outside participants to make sure everyone can easily participate and the moderator is able to smoothly run the meeting.

9. A more detailed agenda with proposed sub-funding and sub-program levels should be provided before the workshop so that participants can comment with more preparation on the proposed allocations of spending. That being said, getting the 2018 and 2019 Reports out in the first quarter as well as orchestrating this workshop on the 2020-21 program early into the second was a big effort and it is much appreciated.

10. Given the complexity of the material, the length of the workshop was about right

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Paul Grimmer
President
Eltron Research

We have a number of programs in various stages of development that could fit well with SoCalGas' objectives of providing cleaner gaseous fuels for your customers.

Ethane to Aromatics – As Jack had indicated, we have a patent pending process that converts ethane into aromatics. Alost all ethane is contained in natural gas, and on a weight basis can be as much as 30% by mass of the total gas stream. Since the late 60s companies have been extracting ethane and using it to make ethylene but even with massive ethylene expansion in the past 5 years, the growth in natural gas supply has outstripped the demand for ethylene and now about 500,000 bpd of ethane is being left in the natural gas streams. On the other hand, aromatics are used in multi-million bpd quantities in the chemical industry and also as an octane enhancer in gasoline. Essentially all aromatics come from crude oil so making them from natural gas will help reduce oil consumption while at the same time making much better use of the ethane than leaving it in the natural gas stream.

On a weight basis aromatics are worth about 6 times as much as ethane so there is a very large economic driver to do this. In addition, there are places in the world such as the north slope of Alaska

where we could get aromatics out via the existing, underutilized oil pipeline whereas the methane will likely never come to market. Just that one field has 1.7 billion barrels of ethane and propane that could be converted to aromatics and shipped to the West Coast that will otherwise likely stay in the ground forever. We have this technology to the point of scale-up.

Superacid - We have invented a new superacid that is about 1 million times stronger than 100% sulfuric acid and is contained inside of porous supports like zeolytes (you can hold it in your hand). This catalyst will have many other applications but the effect on methane alone will be significant. It is strong enough to break the C-H bonds in methane. Combined with a hydrogen membrane we believe we can disproportionate the methane and make iC4 – iC7 along with purity hydrogen. This technology is still at the discovery and proof of concept stage. We have patent applications in covering composition of matter and manufacturing methods.

Hydrogen Membrane Separator and Pump – We had been developing a metallic hydrogen membrane with the DOE until the Obama administration decided to halt R&D for coal (NETL was co-funding us). Our membrane is 100% selective to H2. Rather than using IGCC with carbon capture in a coal-fired power plant to provide a syn gas stream where we could extract H2, we believe there are a couple of different applications that are much better.

One problem with any membrane-type H2 separation device is that there needs to be a significant partial pressure differential to provide the motive force for the H2 to go through the membrane. This makes ow pressure separation difficult, especially when the permeate side is 100% H2. It has been shown with PEMs that by applying a voltage across the membrane, we can get the separation to occur even if the permeate pressure is much higher than the inlet pressure. Unfortunately, the operating temperature limit for PEMs makes them impractical for industrial use. Our metallic membrane does not have those limitations. So we have a hydrogen separation device with 100% selectivity combined with a no-moving-parts pump/compressor.

Here are a few applications for this type of system. At a hydrogen fueling station, this could replace the expensive hydrogen compressors that must be used to pump hydrogen to as much 10,000 psi for transfer to vehicles. In fact, we could likely do it on-the-fly and get rid of the ultra high pressure storage tanks at the “gas” station.

There are many low pressure industrial reactions that make hydrogen that they need to get out of the reactants. An example is a steam methane reformer. Not only could we remove the H2 (and nothing else) but we can do it in the reactor. This shifts equilibrium and allows the reaction to proceed to completion without the need for recycle or many reactors in series. These continuous membrane reactors can be used in many dehydrogenation reactions including ethane to ethylene, propane to propylene, benzene to ethylbenzene and then styrene, etc.

BTW, this system inherently provides CO2 capture because the H2 goes through the membrane, leaving the CO2 and everything else non-H2 in the retentate.

We have spent over $25 million since 2002 on development of our hydrogen membrane. It works well; the program it was funded through was halted and we would very much like to transition it to non-coal use.

Hydrogen Separator & Fuel Cell – Suppose we take the metallic membrane described above and we put a proton conducting ceramic on the back. Electrons would have to flow around the membrane to be combined with protons on the other side. This becomes not only a 100% selective hydrogen membrane but also a very simple and efficient fuel cell.

We have been around since 1982. WE have done over 330 Phase I and II SBIR projects but I am more interested in doing non-SBIR projects that we can get to market. I would very much like to discuss collaboration on any of these with you.

Jonah Steinbuck, Ph.D.
Manager, Energy Generation Research Office
California Energy Commission

CEC Energy Research and Development Division (ERDD) staff appreciate the opportunity to provide comments on plans for the SoCalGas RD&D Program.
For background, the CEC's Natural Gas Research and Development program enables the natural gas sector to support California's energy and environmental goals by accelerating technology innovation. Specifically, the program seeks to: reduce vulnerabilities and fugitive methane emissions in the natural gas infrastructure; improve the cost-competitiveness of renewable gas; and improve the energy efficiency and air quality profile of natural gas end uses. California is currently charting a path towards decarbonization to achieve the state's goals of statewide carbon neutrality and a 100 percent zero-carbon electricity system by 2045 (Executive Order B-55-18; Senate Bill 100, de León, Statutes of 2018). While electrification is a key strategy to achieve these state goals, the natural gas sector continues to play an important role in meeting the state's objectives for reducing carbon emissions, increasing energy efficiency, and safeguarding health and safety.
SoCalGas' RD&D program can complement the CEC's R&D efforts to help meet the state's clean energy goals. For example, SoCalGas is well-positioned to support pilot demonstrations of hydrogen blending in the natural gas pipeline. This is an area of interest for the CEC and one that depends on close collaboration with utilities, including SoCalGas. As another example, the SoCalGas RD&D program can provide a deeper look at fugitive emissions upstream of customer meters, complementing the CEC's behind-the-meter focused research. Additionally, both CEC and SoCalGas have important roles to play in ensuring the safety and integrity of natural gas infrastructure, including through the development of technologies that improve monitoring of infrastructure condition and performance.
Historically, the CEC has successfully partnered with SoCalGas on projects spanning residential and commercial end use appliances, industrial process energy improvements, and transportation with high-efficiency low-emission CNG heavy-duty engines. These collaborative projects have delivered important deployments (e.g., Hyperlight, GTI on food processing) and commercialization achievements (e.g., Cummins Westport).
Additional CEC staff comments are provided below to further our collaboration and the complementarity of our respective programs.

Introduction
As you may know, the SoCalGas RD&D Program identifies and supports new technologies and research activities that benefit customers through improved reliability and safety, environmental benefits and operational efficiencies.
The RD&D Program supports research across the natural gas supply chain:

- Low Carbon Resources RD&D – Decarbonizing the gas supply

  - Renewable natural gas
  - Hydrogen
  - Carbon Capture, Utilization & Sequestration (CCUS)
  - CEC ERDD Staff: A significant focus on decarbonization, including low-carbon resources, is a top priority to meet the state's goals for addressing climate change.
- Gas Operations RD&D – Improving pipeline system safety and reliability
  - System design & materials
  - Inspection & monitoring
  - Environmental & safety
- Customer Solutions RD&D – Reduce emissions & increase efficiency for natural gas customers
  - Clean heat – appliances and industrial
  - Clean generation – electricity generation
  - Clean transportation – vehicles and off-road equipment

Research Plan

The 2019 General Rate Case (GRC) Decision placed additional reporting requirement on the SoCalGas Research, Development & Demonstration (RD&D) Program:

"… SoCalGas should host an annual workshop during the second quarter of 2020 and 2021 under supervision of the Commission's Energy Division. At these workshops, SoCalGas should present the result of the previous year's RD&D program and obtain input regarding its **intended spending for the following calendar year**."

"The research plan should (1) detail budgets broken down by research sub-program area, (2) explain how the projects help improve reliability, safety, environmental benefits, or operational efficiencies and (3) discuss how SoCalGas incorporated feedback from workshop stakeholders and Commission staff."

Input

We need your input to help guide funding allocation for the 2021 calendar year. The questions below are intended to begin a discussion and collect your input and expertise. The Momentum team will be collecting and synthesizing your comments into a guidance document for the RD&D Research Plan team.

Discussion Questions

- Technical Areas: Low Carbon, Gas Operations, Customer Solutions:
  - What technical questions are most pressing from a research standpoint?
    - CEC ERDD Staff: How to effectively support the state's decarbonization goals through technological solutions, including clean hydrogen, renewable gas, and reduction of fugitive emissions.
    - CEC ERDD Staff: How to speed advancement of clean hydrogen technologies
    - CEC ERDD Staff: How to drive cost reductions and facilitate integration of higher blends of renewable gas
    - CEC ERDD Staff: What are the full fuel cycle impacts of renewable gas, including production, transmission, distribution, and end-use
    - CEC ERDD Staff: What are the emissions, durability, and performance impacts to natural gas vehicle engines with blends of hydrogen. Recommend adding CEC staff to the TAC of existing SoCalGas project with UCR.
  - What gaps or significant needs do you see in one or more of these categories?
    - CEC ERDD Staff: Identification and mitigation of fugitive emissions from storage and distribution, complementing CEC's behind-the-meter focused research
  - What pain points must be addressed for natural gas customers?

        - CEC ERDD Staff: Low income energy burden
    - Top three research priorities?
        - CEC ERDD Staff: Key priorities include decarbonization, air quality, affordability, and resilience
- SoCalGas RD&D Program
    - What is your overall assessment of the SoCalGas RD&D Program?
    - What are the key policy drivers that SoCalGas RD&D should consider?
        - CEC ERDD Staff: SB32, EO B-55-18, SB100
    - How is the SoCalGas RD&D Program differentiated (or how should it be) from other RD&D programs (CEC, DOE, etc.)?
        - CEC ERDD Staff: As a utility R&D program, there are opportunities to leverage connections with end-use customers to facilitate adoption of advanced technologies funded through this and other R&D programs.
    - What does the SoCalGas program bring/offer that others cannot
        - CEC ERDD Staff: The opportunity to demonstrate RD&D leadership on decarbonization for an all-gas IOU, providing a model for other all-gas IOUs across the country.
- Other Questions:
    - What customer segment (Res/Comm/Ind) needs additional support from RD&D?
        - CEC ERDD Staff: Low income and disadvantaged communities
    - How should SoCalGas consider ongoing RD&D focused on decarbonization?
        - CEC ERDD Staff: Consider advancing replicable decarbonization solutions in industrial applications where replicability is more challenging (given wide variations in equipment and processes)
    - Other strategic points for SoCalGas's RD&D program?
        - CEC ERDD Staff: Establishing pathways to market adoption for emerging technologies
    - What else should SoCalGas consider to strengthen its RD&D program?
- Other Contacts
    - Who else should we talk to?
- Other Comments
    - CEC ERDD Staff: Delivering hydrogen through the existing natural gas pipeline network has been proposed as a promising strategy to increase the percentage of renewable energy and help decarbonize our natural gas system. To facilitate this, it will be important to develop hydrogen blending standards, deployment strategies, and interconnection requirements that are tailored for California's gas system. The proposed research work on blending and interconnection standards can complement CEC's work on deployment and demonstration, supporting adoption of hydrogen technologies -- including hydrogen generation from renewable energy resources and customer end-use appliances.
    - CEC ERDD Staff: The CEC funds work on the impacts of climate change on natural gas infrastructure. This is an area that can continue to benefit from collaboration. SoCalGas' input on information needs for planning can continue to inform this work. We welcome further engagement and discussion on this topic.

- CEC ERDD Staff: CEC wants to emphasize the importance of addressing equity and environment goals. This is a core focus for the CEC as we accelerate progress toward cleaner energy delivery and a low carbon economy. The CEC would offer two resources for your consideration:
  - (1) the CEC's Empower Innovation platform. This is a new resource for the state's clean energy research programs, researchers, and community organizations. It provides access to funding opportunities – both in the form of grants and venture investment. Anyone can utilize the platform and add a profile to share organizational needs or available funding for projects.

(2) CEC has revised its grant selection criteria to increase benefits to underserved communities. The criteria were developed with input from environmental justice organizations.