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SoCalGas Comments on Draft Research Roadmap

Additional submitted attachment is included below.



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Subject: Comments on the 2019 Preliminary Draft Research Roadmap, Docket # 19-ERDD-01

Southern California Gas Company (SoCalGas) appreciates the opportunity to comment on the California Energy Commission's (CEC) 2019 Preliminary Draft Research Roadmap (Research Roadmap) webinar held on June 28, 2019. SoCalGas provides comments for your consideration on the following sections of the Research Roadmap:

- **Section 6—Bioenergy**
- **Section 10—Energy Storage Systems**

Section 6—Bioenergy

- Both initiatives (Improved Cleanup of Syngas Resulting from Gasification and Fund Thermal Hydrolysis Precursor to Anaerobic Digestion Systems Capable of Accepting Multiple Waste Stream) cover important research areas in the space of biomass conversion.
- It is important to ensure the language of the initiative is not too restrictive. The research should not depend on the source of the syngas or where the feedstock will be used. For example:
 - Syngas can be produced through processes including pyrolysis and hydrothermal processing. Improved syngas cleanup is important for any technology that produces syngas, not just gasification.
 - Thermal hydrolysis could be an effective feedstock pretreatment for hydrothermal processing.

Section 10—Energy Storage Systems

- These initiatives should consider hydrogen energy storage (HES): Solar and wind production frequently exceeds electrical demand, and there is limited ability to store this

surplus energy optimally.¹ In the absence of a comprehensive energy storage solution, the California Independent System Operator curtails these renewable sources, resulting in wasted energy. The production of electrolytic hydrogen prevents curtailment of high penetrations of variable renewable generation by making use of surplus renewable electricity, which otherwise would be wasted, by storing it for later use as needed in any of several applications. Battery technologies offer shorter-term grid support functionalities with 2-4 hours of discharge duration with significant life cycle degradation over time, whereas hydrogen energy can be stored with longer duration discharge cycles measured in days to months. As California is faced with an increasingly urgent need to deploy utility-scale energy storage solutions to support intermittent renewable power generation, electrolytic hydrogen must be evaluated rigorously for its potential to serve as a large-scale storage option.

- The “Associated Technology Advancement” section of Initiative 10.1 includes “Flywheels, Battery Improvements, Small-Scale Pumped Hydro Storage, Thermal Energy Storage” but not hydrogen. The list should be amended to explicitly include hydrogen as an eligible technology area for research purposes.
- The “Success Timeframe” section of Initiative 10.1 indicates “Long Term: 5 years +.” This time frame could be shortened significantly by focusing research on HES which has been shown to provide long duration storage in Europe and Canada.
- 8 hours may not be sufficient to achieve a high renewable fraction on the grid. HES can provide storage for 8 hours, 8 days, 8 weeks, or more. We agree with the “Metrics and/or Performance Indicators” section of Initiative 10.1 that “Duration should increase beyond 8 hours into multiple days.”

Conclusion

Thank you again for the opportunity to provide comments on the Research Roadmap. SoCalGas looks forward to working with the CEC on future research and development opportunities.

Sincerely,

/s/ Tim Carmichael

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¹ See *Impacts of Renewable Energy on Grid Operations*, California Independent System Operator (May 2017) at 1, available at: <http://www.caiso.com/Documents/CurtailmentFastFacts.pdf>