

Exhibit to Agenda Item #1

Provide the Board with external and internal presentations followed by a panel discussion on SMUD's **Green Hydrogen / Biofuels programs.**

Board Strategic Development Committee and Special SMUD Board of Directors Meeting

Tuesday, June 7, 2022, scheduled to begin at 5:30 p.m.

Virtual Meeting (online)

SMUD's Outlook: Past & Ongoing Hydrogen and Biofuels Activities



Ed Hamzawi
Director, Advanced Energy Solutions
&
Joel Ledesma
Director, Power Generation



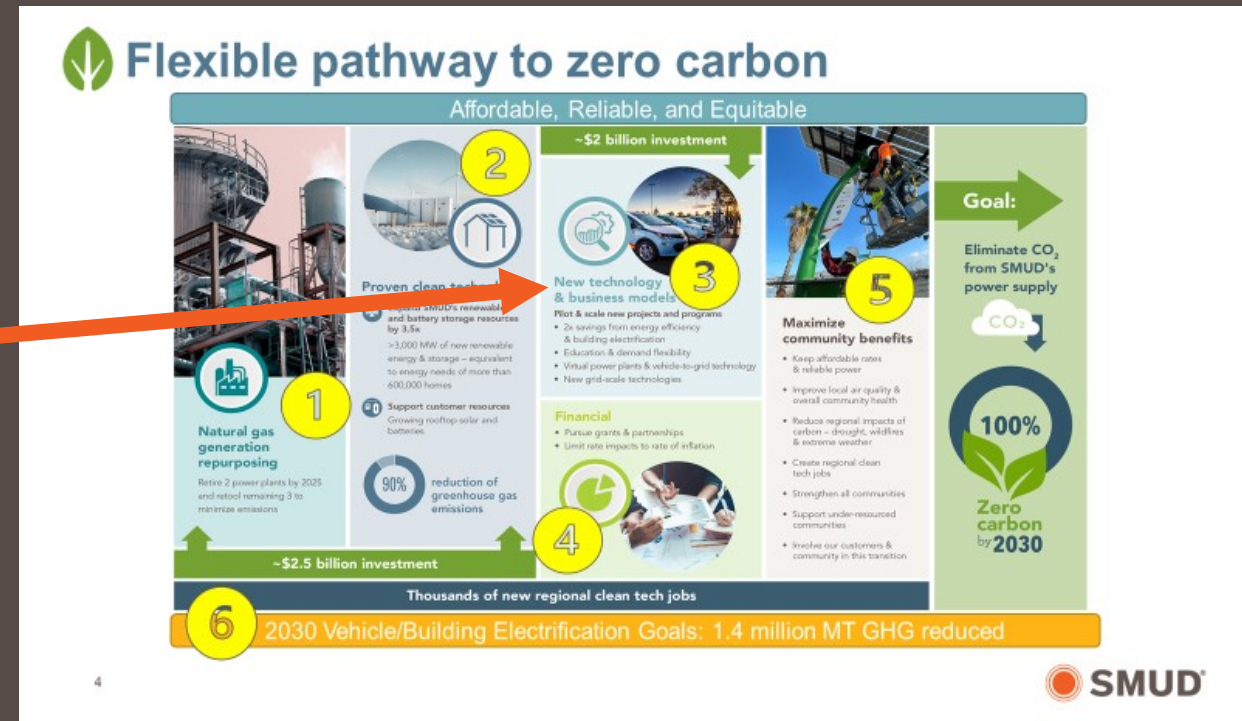
Hydrogen and Biofuels in the 2030 ZCP

How do Hydrogen & Biofuels fit into the Zero Carbon Plan (ZCP)?

3

New technology and business models in ZCP

Explore new and emerging grid technologies - Alternative Fuels or Clean Fuels like power-to-gas technology, hydrogen and Renewable Natural Gas (RNG) ... - that are either currently unknown or are not ready for large scale adoption due to price, reliability or other factors.



Pursue clean fuels to completely eliminate natural gas use

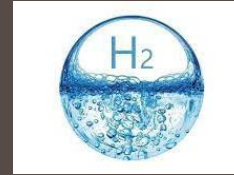
2022

2030

Past & Ongoing Hydrogen Projects



2014-2015 - Completed R&D of TDA's Biogas Clean Up & Fuel Cell Energy's 2 kW Solid Oxide Fuel Cell (SOFC) at Cal Denier Dairy Farm



2021 Completed the Assessment of Alternative Fuels with Hydrogen



2017 - Completed Assessment of Cost Trends for Stationary Fuel Cells



2021 to 2023 US Department of Energy (DOE) H2Scale Grant Funded Collaborative Pipeline Hydrogen Project



2015 -2020 Commercial Installations of Bloom Energy Fuel Cell: 750 kW SOFC at Intel & 400 kW SOFC at Sleep Train



2022 to 2025 Pilot Testing and Assessment of Safety and Integrity of Targeted Hydrogen Blending. Pending Grant Award from California Energy Commission (CEC)



2020 – Completed the Carbon Neutrality Assessment with Renewable Hydrogen



Pursue Grants – e.g., DOE Hydrogen Hub – Partnership Industry engagement

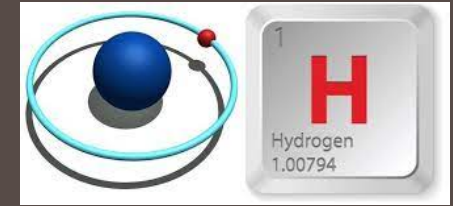


2021 CEC-funded Sacramento Region Medium and Heavy Duty Zero Emission Vehicle Blueprint Planning Project



2022 Complete Research Plan for Alternative Fuels

Hydrogen Hub



- Biden signed the Infrastructure Investment and Jobs Act which will provide:
 - \$8 Billion over 5 years (fiscal years 2022 through 2026)
 - DOE to fund 4 regional clean hydrogen hubs that demonstrate the production, processing, delivery, storage, and end-use of clean hydrogen.
- Go.Biz is coordinating a collaborative California response for clean hydrogen that will include
 - Northern California Pacific H2ub Concept led by PG&E
 - Angeles Link led by SoCalGas
- DOE Funding Opportunity Announcement (FOA) to be released, TBD (delay)

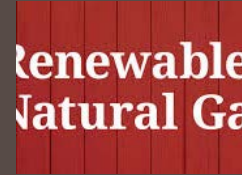
SMUD's Potential Participation

- Evaluate SMUD's participation to inform decision making regarding re-tooling our thermal fleet and using renewable fuels.
- Potential assessments and pilots as part of the partnership

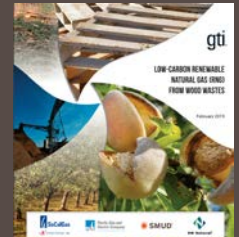
Past & Ongoing Biofuels Projects



2019-2021 - Completed Biomass Resource Assessment for Distributed Generation and Renewable Natural Gas (RNG)



2021 Completed Assessment of Alternative Fuels with Renewable Natural Gas



2018 -2019 Completed Techno Economic & Engineering Study of Thermal Gasification of Biomass to Produce Renewable Natural Gas



SMUD's Active Renewable Natural Gas Contracts



2019 E3 Assessment of Decarbonization of Natural Gas Scenarios – with Renewable Natural Gas



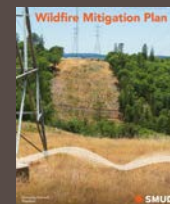
Pursue Grants Industry engagement



2020 – Completed Carbon Neutrality Assessment with Renewable Natural Gas



2022 Complete Research Plan for Alternative Fuels



Ongoing Vegetation & Forest Load Management, 2022 Wildfires Mitigation Plan

RNG in SMUD's Portfolio

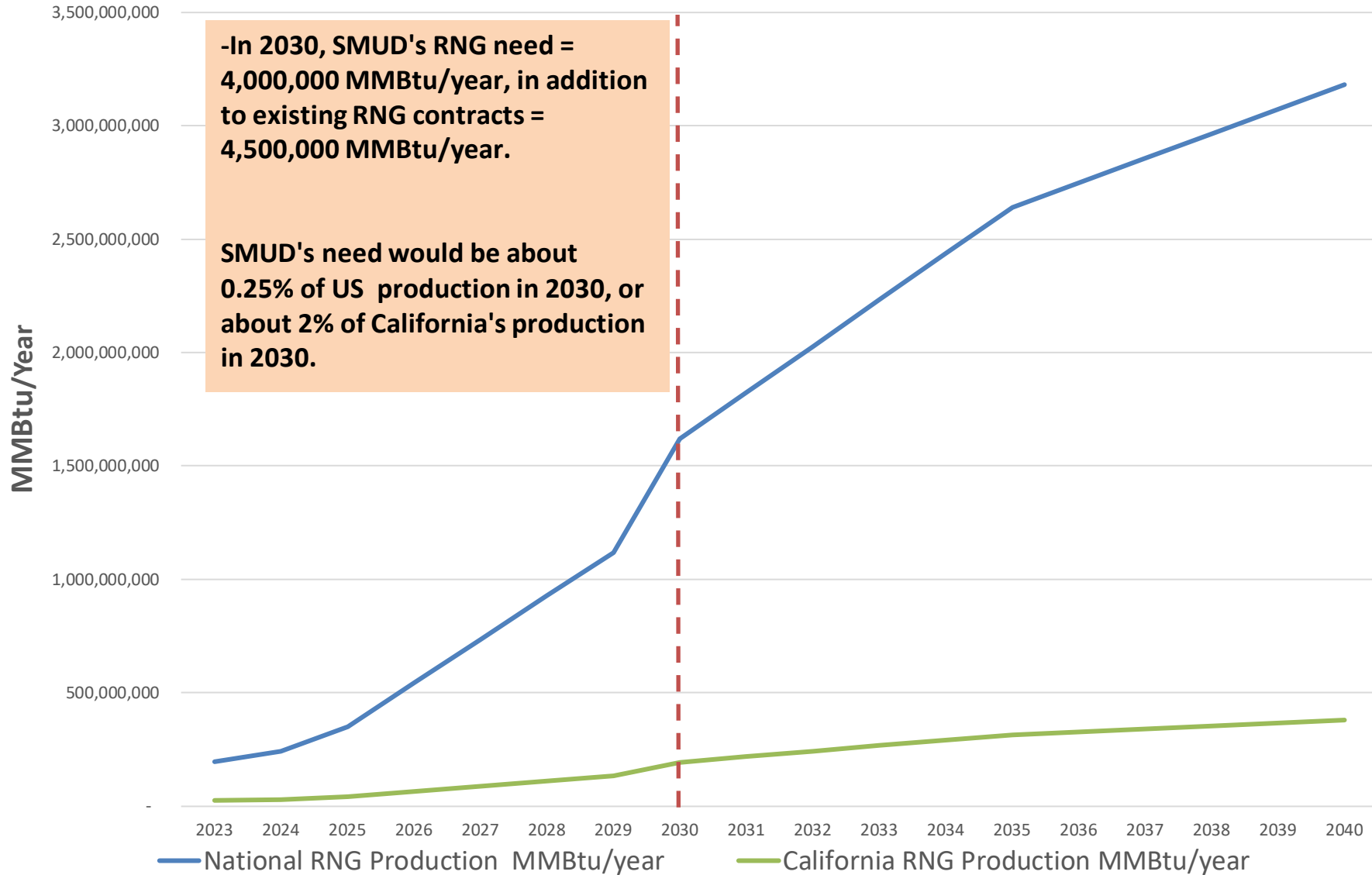
SMUD was an early adopter of RNG and has been blending it to generate offsets for Cosumnes Power Plant since 2009

Volumes under contract to 2034 represents about 17 percent of Cosumnes Power Plant's daily fuel needs

SMUD continues to view RNG as a key transition fuel to green hydrogen, other renewable fuels, and carbon sequestration as options towards achieving our 2030 Zero Carbon goals

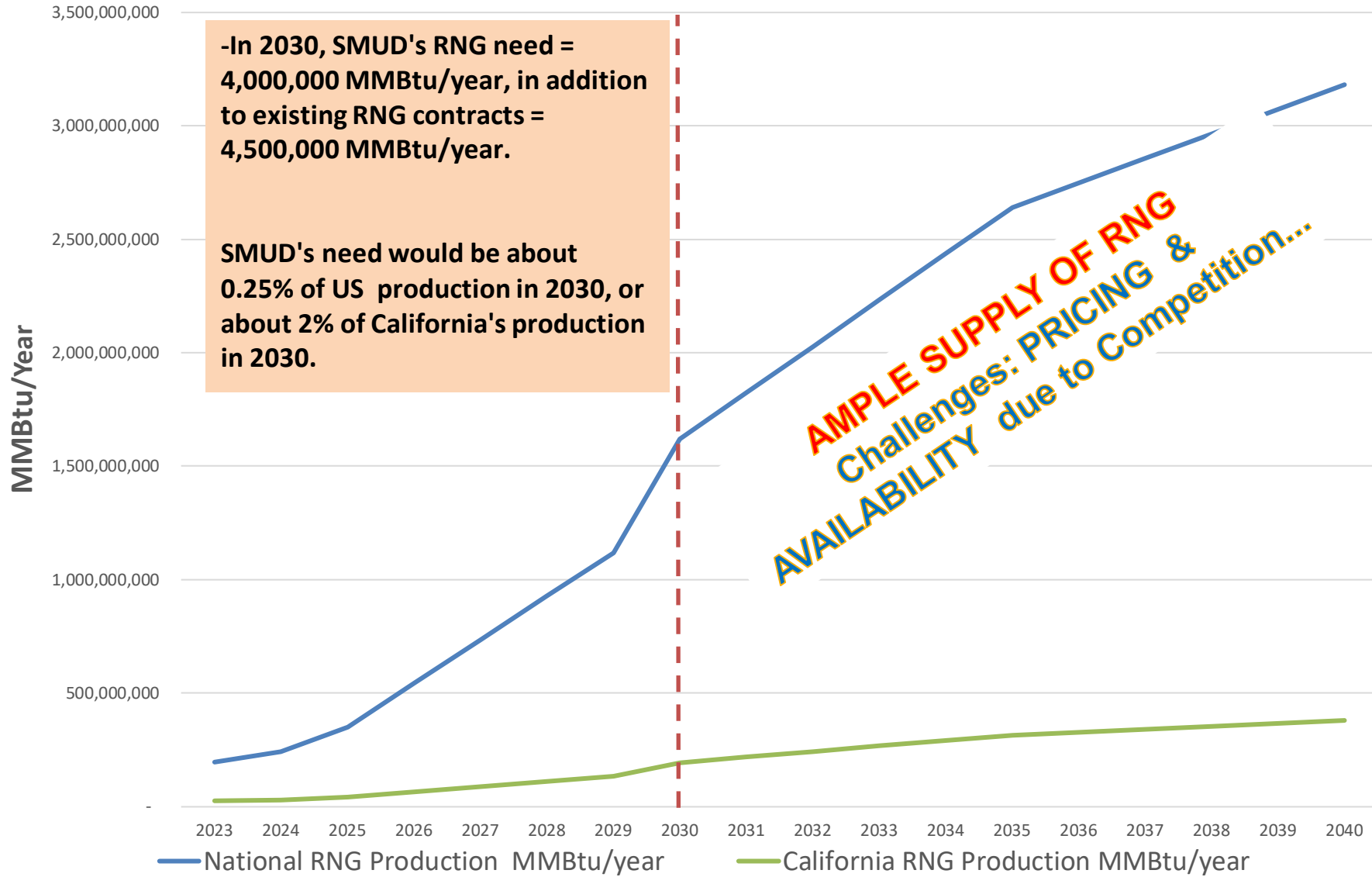


Estimated U.S. and California Renewable Natural Gas (RNG) Production



Source:
Data derived from
ICF 2019

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