Natural Gas Pathways: Towards a Clean/Renewable Energy Future for CA

National Conference of State Legislatures (NCSL)
Annual Summit – Task Force on Energy Supply
Sunday, July 29, 2018 – Ken Chawkins, Business/Policy Manager, SoCalGas
# Sempra Energy Overview

<table>
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<th>Company</th>
<th>Description</th>
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<tr>
<td><strong>Southern California Gas Company (SoCalGas)</strong></td>
<td>- The nation's largest natural gas distribution utility to more than 20mm consumers across 20k square miles throughout central and Southern California.</td>
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<tr>
<td><strong>San Diego Gas &amp; Electric (SDG&amp;E)</strong></td>
<td>- Provides electricity and natural gas to 3.4 million consumers across 4,000 square miles from Orange County to the Mexican border.</td>
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<td><strong>Sempra International</strong></td>
<td>- Produces and distributes energy in competitive markets of the Americas.</td>
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<td><strong>Sempra U.S. Gas &amp; Power</strong></td>
<td>- Develops clean power solutions in markets throughout the U.S. with a focus on zero and low-emission fuels.</td>
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SoCalGas Overview

» Nation’s largest natural gas distribution utility
» In business for 140+ years
» 12 counties, 500+ communities served
» 21.1 million consumers
» 5.8 million gas meters
» 20,000+ square miles of service territory
» 8,240 active employees
California’s Dual Emissions Challenge
Federal Clean Air Act and California Climate Change Initiative

FEDERAL CLEAN AIR ACT
Reduce SMOG by **50-60%**
by 2023

CA CLIMATE GOALS
AB 32 & Gov’s Exec Order
Reduce GHG emissions **80% of 1990**
by 2030

Measures to Reduce Smog **and** GHG Emissions
Drive Today’s Energy and Environmental Agenda
Current plans will take too long FOR CLEAN AIR

Ozone reductions need to be achieved *Faster and Sooner* than current statewide GHG reduction goals.

- **Project Statewide GHG reduction**
- **SCAQMD co-benefit NOx reduction** from statewide GHG program
- **SCAQMD needed reduction to meet federal ozone standards**

**80 ppb ozone standard**  
**75 ppb ozone standard**

Source: CARB Vision for Clean Air report, June 2012

1 South Coast Air Quality Management District (SCAQMD)
We have a CLEAR FOCUS: Transportation

80% of the region’s SMOG

Nearly 40% of its GHG emissions
Start with the **BIGGEST POLLUTERS**

- Heavy & Medium Duty Trucks
- Off Road Equipment
- Cars
- Light Duty Trucks
- Light-Heavy Duty Trucks

*Top NOx Source Categories*

Source: CARB Staff Report for 8-Hour Ozone State Implementation Plan Emission Inventory Submittal
NGV Game Changer:
NEW “NEAR-ZERO” TRUCK ENGINE TO BE READY FOR PRIME TIME

- Heavy Duty truck engine with 90% lower NOx emissions TODAY
- Tailpipe emissions are the same as emissions from generating electricity to run a similar electric truck
- For Goods Movement, this truck will meet California’s ambitious 2050 targets decades before any other technology
- RNG already delivering greatest GHG reductions from diesel TODAY?

Near-Zero Emissions Natural Gas Engine

<0.02 g NOx
90% NOx reduction

Renewable Natural Gas as Transportation Fuel

> 80% GHG reduction

Glad to be of service.*
Renewable Natural Gas Offers Lower and Lower Carbon Intensity

Carbon Intensity Rating of Key Transportation Fuels

- Diesel (conventional): 102.01 gCO2e/MJ
- Natural gas (conventional): 88.6 gCO2e/MJ
- Hydrogen (from natural gas): 55.61 gCO2e/MJ
- Diesel (renewable): 39.06 gCO2e/MJ
- Electricity (California grid): 38.95 gCO2e/MJ
- RNG - Landfill gas: 65.64 gCO2e/MJ
- RNG - Wastewater biogas: 34.36 gCO2e/MJ
- RNG - Food/green waste biogas: -25.48 gCO2e/MJ
- RNG - Dairy biogas (prospective): -303.3 gCO2e/MJ
California Climate Change Policy
Need for “Near-Zero” End Uses and Low Carbon Gas

California focused on electrifying end uses and “de-carbonizing” electricity
- De-carbonize generation
- Electrify transportation
- Electrify energy end uses

SoCalGas focused on “near-zero” end use technology and “de-carbonizing” the pipeline
- Near-zero gas technology (HD Trucks)
- Decarbonize gas supply
  - Biomethane/RNG
  - Power To Gas
  - New Renewable Methane Feedstocks

It’s NOT Either/Or.
It’s BOTH!
De-Carbonizing the Pipeline: Waste or Biomass: Biomethane to Renewable Gas
Renewable Gas
Practical benefits for California

Waste to Biogas
- Significantly Reduce Odors
- Better Control of Waste Water
- Enhanced Nutrient Recovery and Plant-availability

Collect in Pipelines
- Efficiently Transport Biogas
- No Truck Traffic, Noise, or Emissions
- Open Access System for Future Growth

Process & Upgrade
- Ensure Gas is Safe for Existing Pipelines
- Ensure Proper Combustion and Consumer Safety

Pipeline Injection
- Efficient Transportation to Existing Customers
- Flexible, Reliable, and Resilient Energy Network
- No New Combustion Source

End Use
- Displaces Traditional Fuel
- Clean, Reliable, Resilient Energy
- Low-zero carbon Emissions

Renewable Gas
Practical benefits for California
De-Carbonizing the Pipeline:
Power-to-Gas: Excess Renewable Electricity to Renewable Gas
Power-to-Gas Projects:
Provides green hydrogen pathway and grid storage

- 70 Projects Now Launched in Europe
- 40 Projects Launched in Germany, with more in development
- 30 MW of installed capacity
Noteworthy RNG Legislative/Regulatory (CA)

- **SB 1383 (Lara, 2016)** – Directs regulatory bodies to address Short Lived Climate Pollution
  - Short Lived Climate Pollution Plan -- reduce methane by 40%
  - Determine state-wide reduction targets for Methane
  - Develop policies to support renewable gas development
  - Regulatory bodies directed 5 dairy projects

- **SB 1440 (Hueso)** - Establishes a utility procurement mandate (RGS) of 5% of core volumes annually by 2030
  - Approved by Senate; awaiting hearing in Assembly Appropriations in Early August

- **Biomethane Rulemaking/CPUC** - Injection standards/interconnection incentives
  - Draft Scoping Memo focused the proceeding narrowly on SoCalGas
  - Comments filed requesting that the CPUC include hydrogen in the scope
  - Develop a comprehensive renewable gas policy for utilities.

- **RNG for Transportation**—SoCalGas recently received authority from the CPUC to deliver RNG to NGV refueling stations on its own property.
Noteworthy Renewable Gas Developments

» Navigant Study
  - RNG Most Cost Effective GHG Reduction
  - Less than 20% of NG/RNG replacement reduces same amount of GHG as 100% electrification in buildings

» CR&R – Private Interconnection
  - Trash hauling fleet / Using Low Carbon Fuel Standard
  - Excess flows to SoCalGas pipelines to wheel

» France/Canada/SoCalGas Partnership
  - Energir (Canada) / GRDF and GRTgaz (France)
  - R&D / Outreach / Public Policy support
  - RNG and P2G targets
Natural Gas Pathways of Tomorrow