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April 17, 2015

Gabriel Corley, CTP Project Manager
Division of Planning, MS-32
California Department of Transportation
P.O. Box 942874
Sacramento, CA 94274-0001

Submitted to: ctp2040@dot.ca.gov

RE: California Transportation Plan 2040, Public Draft

Dear Mr. Corley:

Southern California Gas Company (SoCalGas) is one of California's investor-owned utilities regulated by the California Public Utilities Commission. We have been delivering clean, safe and reliable natural gas to our customers for more than 140 years, and are the nation's largest natural gas distribution utility, providing safe and reliable energy to 20.9 million consumers through 5.8 million meters in more than 500 communities. SoCalGas' service territory encompasses approximately 20,000 square miles in diverse terrain throughout Central and Southern California, from Visalia to the Mexican border. SoCalGas is a regulated subsidiary of Sempra Energy (NYSE: SRE), a Fortune 500 energy services holding company based in San Diego.

SoCalGas appreciates the opportunity to submit these comments on the "California Transportation Plan 2040" (Plan) prepared by the California Department of Transportation (Caltrans). The Plan focuses on California's transportation system and explores major trends that will likely influence travel behavior and transportation decisions over the next 25 years. It outlines goals, policies, strategies, performance measures, and recommendations to achieve that vision. The Plan provides a policy framework designed to guide transportation-related decisions for the betterment of all who live, work, and conduct business in California. SoCalGas believes that natural gas should be part of the Plan, because it is an important energy resource for California and because it provides a low cost, efficient and reliable source of clean energy. Natural gas use will continue to be the preference for businesses and consumers as future natural gas prices are expected to stay reasonably low with widespread supply availability. Thus, we have a number of concerns with the report centered on the following issues:

Chapter 7

- In the discussion of alternatives 1-3 on page 86 of the Plan, Caltrans notes that “these alternatives are designed to show the GHG reductions that may be achieved by different mixes of transportation strategies and technology.” SoCalGas requests that a statement be added to this paragraph clarifying that there may be other mixes of strategies, in addition to those modeled in alternatives 1-3, which could also achieve the same outcome, e.g. meet the state’s goal of an 80 percent reduction in transportation system GHGs. SoCalGas has prepared a study of the role that natural gas can play in reaching both the state’s GHG goal in 2050, and also the ozone attainment goals by the deadlines of 2023 and 2032. We have attached a presentation that explains the need for more emission reductions and sooner.

Chapter 8

- On page 111, one of the mid to long range recommendations is to “partner with industries and innovators involved in technological approaches to environmental improvement” and on page 112, one of the short-range recommendations is to “support technological research and development of alternative fuels and transportation modes that can further improve air quality.” SoCalGas would like to meet with Caltrans to discuss various natural gas related technology advancements in our industry, and the results of some of our internal research and development. In the near future, heavy-duty natural gas engines will achieve an emission rate of 0.02 g NOx/bhp-hr, a 90% reduction over the current certified California Air Resources Board (CARB) standard of 0.2 g NOx/bhp-hr. The South Coast Air Quality Management District (SCAQMD) has referred to this engine as “power plant equivalent”. Power plant equivalent is defined as the emissions generated from a state of the art combined cycle gas turbine able to be cited in the south coast basin. Aggressive deployment of this technology would result in significant GHG and ozone reductions.
- On page 112, one of the short range recommendations to support Environmental Stewardship suggests that users of the 2040 CTP continue to promote zero emission policies, specifically those promoting zero emission vehicles. While proliferation of zero emission vehicles will contribute to attainment of climate change goals, SoCalGas believes there is a role for near-zero vehicles as well. Near-zero vehicles could achieve significant reductions in criteria and GHG emissions and not only help the state achieve the mandated 80 percent reductions in GHG emissions by 2050, but also help the state attain federally required ozone standards by the much earlier deadline of 2023. SoCalGas recommends that Caltrans insert the following as an additional short range recommendation under the “Practice Environmental Stewardship” category:

“Support and promote the deployment and use of near-zero vehicles wherever it can be demonstrated that these vehicle technologies will achieve significant emission reductions and progress towards attainment of state and federal NAAQS and GHG goals.”

- One of the short-range recommendations under the “Expand Freight Network Capacity” category (see page 123) is to “incorporate freight projects into planning documents...” SoCalGas believes that alternative fueling infrastructure will be one critical factor affecting successful deployment and penetration of alternative vehicles, especially medium-heavy and heavy-heavy duty vehicles, in the freight sector. In the past, fueling infrastructure has been left to the private sector to plan and deploy. SoCalGas believes that the development of an alternative fueling infrastructure plan for hydrogen, electricity and natural gas by state and local transportation agencies is now necessary. This plan would lay the foundation for development of a statewide alternative fueling infrastructure that will support an efficient and sustainable goods movement industry, thereby facilitating the introduction and successful deployment of alternative fueled vehicles in the freight sector. SoCalGas recommends that the following recommendation be added to this category:

“Develop regional and statewide alternative fueling infrastructure plans for hydrogen, electricity and natural gas to facilitate both the successful deployment of alternative fueled vehicles into the freight sector and the construction of alternative fueling infrastructure connecting marine, air and intermodal ports and freight corridors such that California achieves a statewide environmentally sustainable and economically efficient goods movement system.”

- On page 125, one of long-range recommendations is to “subsidize and incentivize (via legislation) an aggressive shift to alternative vehicle fuels, including, but not limited to biofuel blends, hydrogen, and electricity in order to achieve the 2050 GHG reduction target for the transportation sector” as well as “subsidize and incentivize (via legislation) an aggressive advancement of vehicle technologies in order to achieve the 2050 GHG reduction target for the transportation sector.” SoCalGas is supportive of the development of alternative vehicle fuels to achieve GHG reduction targets. We urge Caltrans to be supportive of emerging natural gas and renewable natural gas/biomethane (biogas obtained from landfills, dairy digesters, wastewater treatment facilities, etc) technologies for the transportation sector. Near-zero natural gas trucks can help California meet its climate change and air quality goals. There is technology under development today, available as early as 2018, which can reduce NOx emissions in the heavy duty truck sector by 90% on top of the 20% reduction in carbon intensity enjoyed by natural gas today when compared to diesel. Near-zero heavy-duty truck engines can provide a new foundation for the state’s strategy to clean up smog, eliminate diesel particulates, as well as reduce the state’s greenhouse gas footprint. Transitioning heavy-duty diesel trucks to alternative fuels would immediately have a positive impact on the health of Californians and our environment. This is a proactive way to reduce harmful emissions, clean up our air and enhance goods movement services to local businesses.

- Under the category of “Reduce GHG Emissions in the Transportation Sector” (see page 125) one recommendation regards the creation of incentives for drivers of zero emission vehicles. SoCalGas requests that near-zero emission vehicles be included in this recommendation as near-zero vehicles can also contribute significant GHG emission benefits, by just switching to lower carbon intensity natural gas, and potentially, in much sooner time frames. One such example would be the introduction of the 0.02 g NOx/bhp-hr engine natural gas fueled HD truck engine.

Looking forward, natural gas will be a foundation for new energy pathways, delivering energy with virtually near zero emissions, sooner and more cost-effectively than relying on electric only technologies. The ongoing drive to reduce both criteria and GHG emissions, and to improve overall energy efficiency, will continue to reshape gas technologies and end uses.

If possible, SoCalGas would appreciate a seat at the table for the Technical Advisory Committee as well as the Policy Advisory Committee.

We would also like to meet in person with Caltrans to discuss their Transit and Intercity Rail Capital Program which funds bus and rail capital improvement projects that target disadvantaged communities, expand rail systems, reduce greenhouse gases, improve safety, and enhance connectivity to high-speed rail.

SoCalGas appreciates your consideration of these comments and your willingness to meet with us to further discuss the issues raised in this letter. Thank you and if you have any questions, please do not hesitate to contact me by telephone or email.

Sincerely,



Tanya Peacock
Public Policy and Planning Manager
Southern California Gas Company

Natural Gas Pathways:

*Towards a Clean and Renewable
Energy Future for California*

**ATTACHMENT – SoCalGas April 17, 2015 Comments
Regarding
California Department of Transportation (Caltrans)
draft 2040 California Transportation Plan**

**Tanya Peacock
Public Policy and Planning Manager
Southern California Gas Company**

Agenda for Today

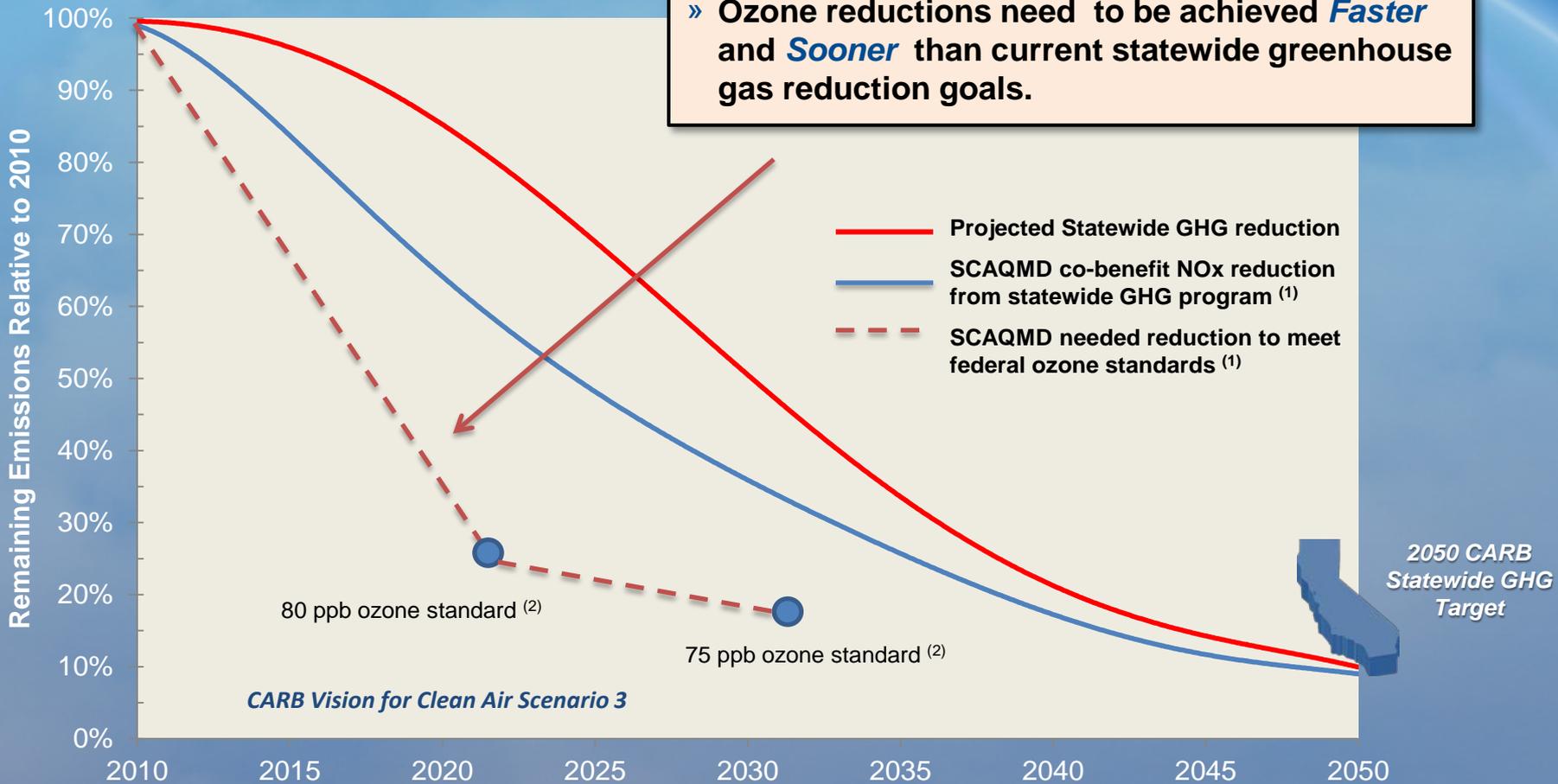
There have been many developments in natural gas technology and the ability of NG to help reduce pollution.

- Pathways to ozone and GHG goals
- Exploring the potential for very substantial NOx reductions in transportation sector
- Potential for Natural Gas for goods movement and at the Ports
- Decarbonizing our gas supply to address GHG goals

Your interests and questions?

Current State GHG Pathway Misses Ozone Deadlines

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



CARB Vision for Clean Air Scenario 3

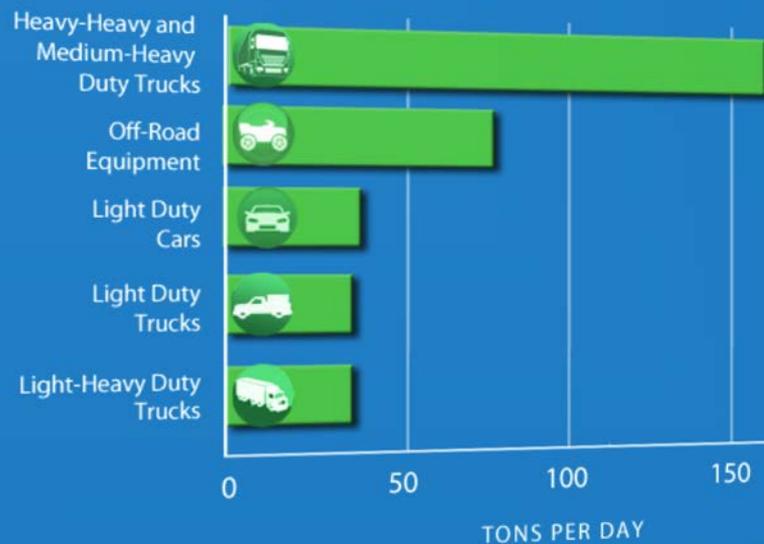
¹ South Coast Air Quality Management District (SCAQMD)

² parts per billion (ppb)

Natural Gas Transportation Pathways Can Improve the Environment – *Today!*

Top 5 NO_x Source Categories

SCAQMD NO_x

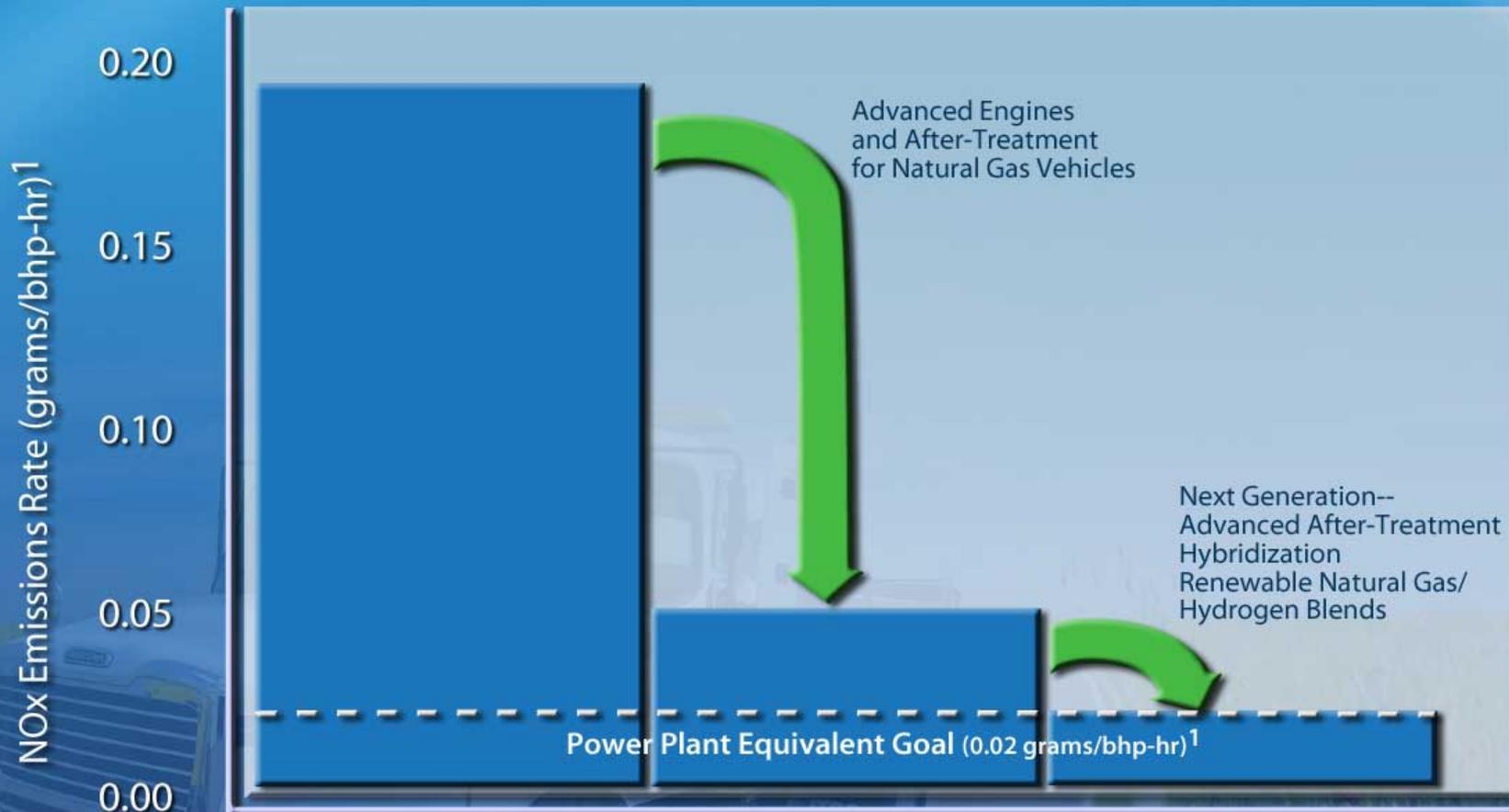


FASTER EMISSIONS
REDUCTIONS AHEAD

Note: Based on the 2012 NO_x inventory from the California Air Resource Board (CARB)
Source: CARB Staff Report for 8-Hour Ozone State Implementation Plan Emission Inventory Submittal

Transportation Sector Key to Reach
Ozone and GHG Goals

Technology Strategies Address Ozone Goals



Current
NOx <0.2
Standard

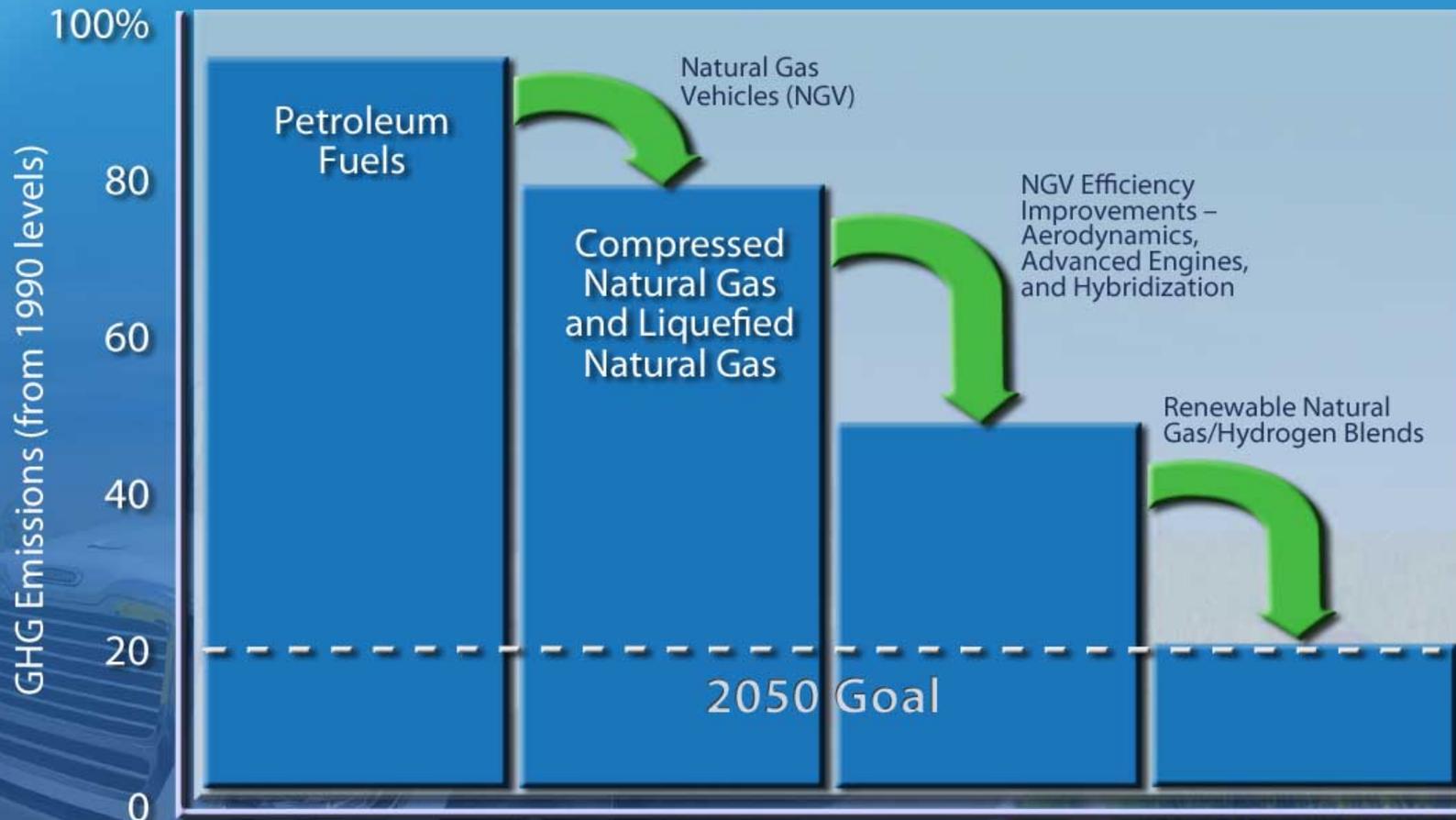
Current Advancements
0.05
(2014-2017)

NZE Goal
0.02
(2018-2023)

¹. grams per brake horsepower hour (g/bhp-hr)

Technology Strategies Also Address GHG Goals

Efficiency Improvements & Renewables Availability Increase Over Time



Technology Transfer and Transportation Pathways

SoCalGas' Transportation Pathway focuses on natural gas vehicles in heavy duty sectors, which represent the largest share of both ozone/greenhouse gas problem. Technology transferrable to other sectors:

Current Focus

Expanding Focus



Transit/Fleet
Vehicles



Heavy Duty
Trucks
Short/Long
Haul



Cargo Handling
Equipment



Locomotives
Short/Long
Haul



Marine Vessels

CNG



LNG

NGV Game Changer

New "Near Zero" Truck Engine to be
Ready for Prime Time.

SCG working with SCAQMD,
other Agencies, and Engine
Manufacturers to develop
truck engine 90% lower
emissions for 2018!



**Near Zero Emission
Natural Gas Engine**
•<0.02 g NOx



Tailpipe emissions the same as emissions from generating
electricity to run similar truck on electricity, years before heavy-
duty EV trucks ready for the market



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Exploring the Potential for Substantial Reductions



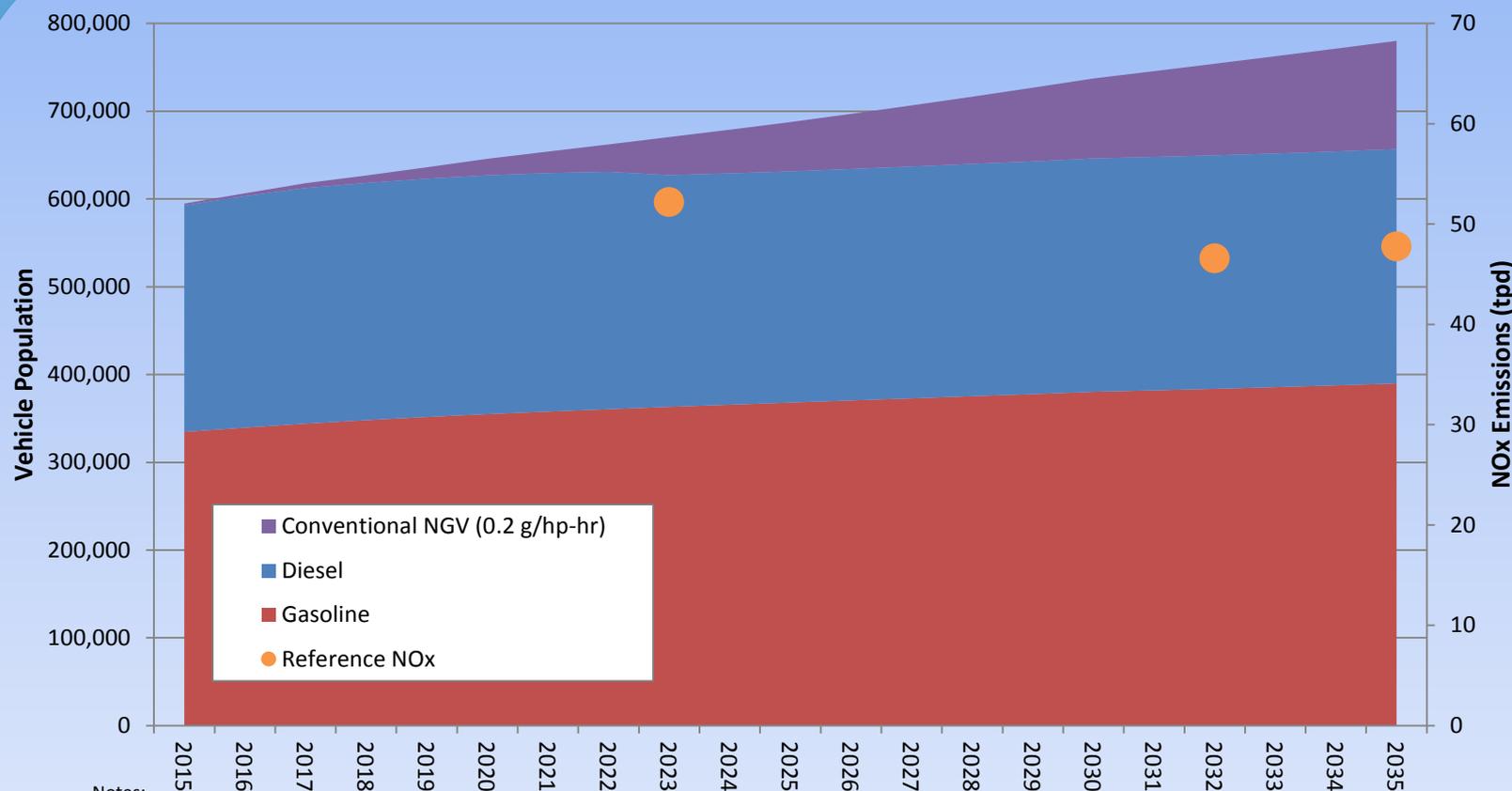
Critical Need for NOX Reductions *Natural Gas in Transportation Can Deliver*

- Significant fuel price savings will drive natural gas technology adoption by the heavy-duty trucking sector.
- Financial incentives (\$10-25K/vehicle) can *accelerate* and *increase* the adoption of conventional natural gas technologies, helping air districts (esp. SC and SJV) meet ozone deadlines.
- Additional financial incentives (<\$10K/vehicle) can shift conventional natural gas technology purchases to Near Zero Emmission natural gas purchases, maximizing NOx reductions.
- For LA area, NZE incentive period (2018-2023) can deliver 35% NOx reduction (17 TPD) by 2023. Continued NZE adoption program can deliver a 63% reduction (30 TPD) by 2032 in LA area.

SoCalGas High- BASE CASE

In-state Heavy-duty Truck Fleet Composition ¹

- No Incentives -

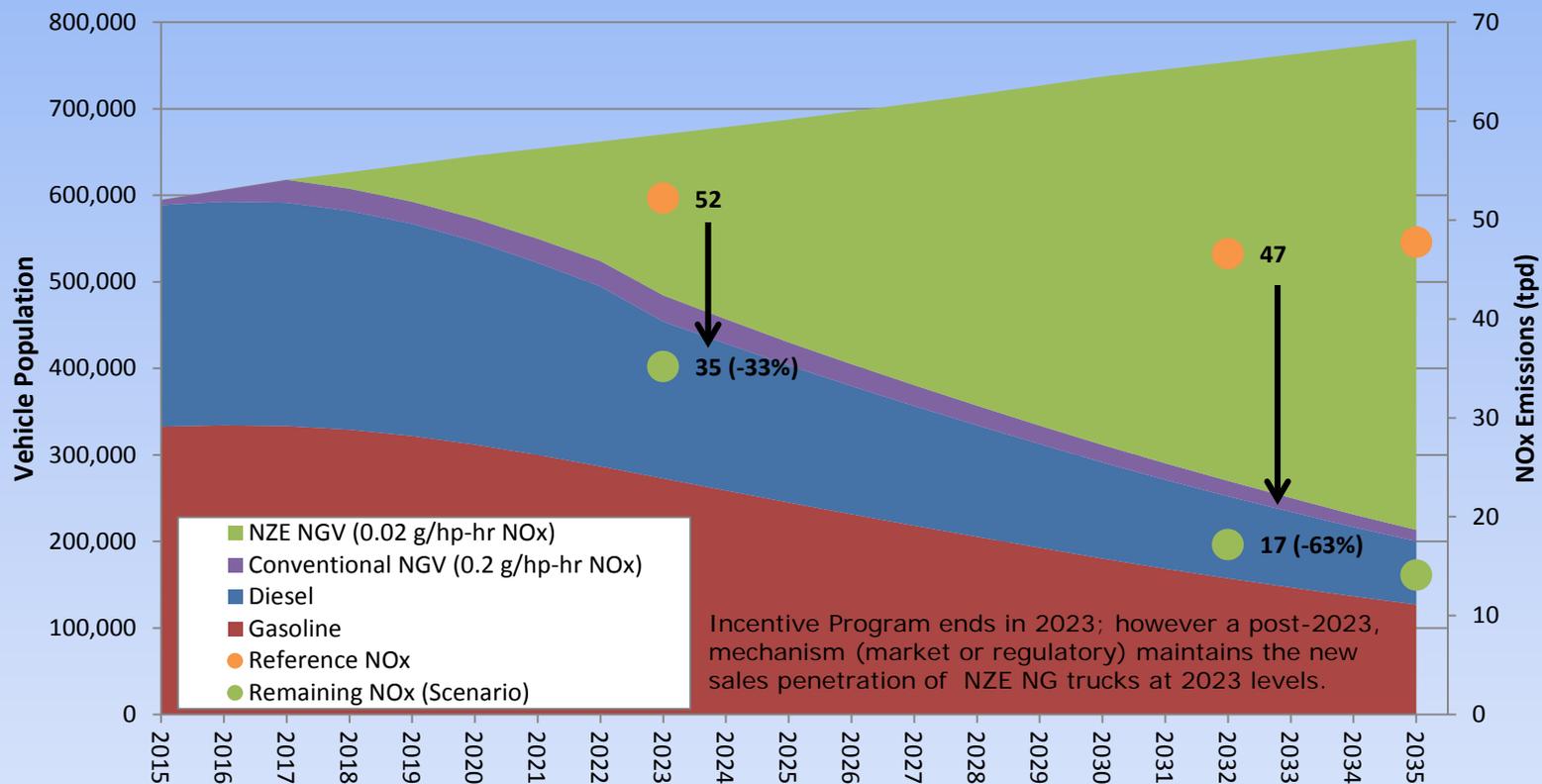


Notes:

1. Analysis includes T7 Drayage, T7 Single, T7 Solid Waste Collection Vehicle, T7 Tractor, T7 Tractor Construction, T7 Agriculture, T7 Single Construction, T7 Public, T7 Utility, T7 IS, T6 Instate Heavy, T6 Instate Small, T6 Utility, T6 Public, T6 TS, T6 Agriculture, T6 Instate Construction Heavy, T6 Instate Construction Small, LHDdT, and LHDGT.
2. Vehicle population is based on the EMFAC2011 data for the South Coast Air Basin.
3. Reference NOx emissions were obtained from the 2012 Air Quality Management Plan (AQMP) from the SCAQMD.

SoCalGas High Incentive Scenario In-State Heavy-duty Truck Fleet Composition ¹

- MODIFIED Maximum Incentivized² NG Truck Purchases -



Incentive Program ends in 2023; however a post-2023, mechanism (market or regulatory) maintains the new sales penetration of NZE NGV trucks at 2023 levels.

- Note:
1. Analysis includes T7 Drayage, T7 Single, T7 Solid Waste Collection Vehicle, T7 Tractor, T7 Tractor Construction, T7 Agriculture, T7 Single Construction, T7 Public, T7 Ut T7 IS, T6 Instate Heavy, T6 Instate Small, T6 Utility, T6 Public, T6 TS, T6 Agriculture, T6 Instate Construction Heavy, T6 Instate Construction Small, LHDdT, and LHDGT.
 2. Maximum incentives range from \$15,500 - \$35,000/Truck depending on the vehicle type and engine size
 3. Assumed penetration rates after the incentive period ends remain at the 2023 level due to some mechanism.



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Potential for Natural Gas at the Ports

Put Marine Vessels on the Natural Gas Pathway



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2050
GHG GOAL

*Commercial Harbor Craft,
Tier 5 Exists*

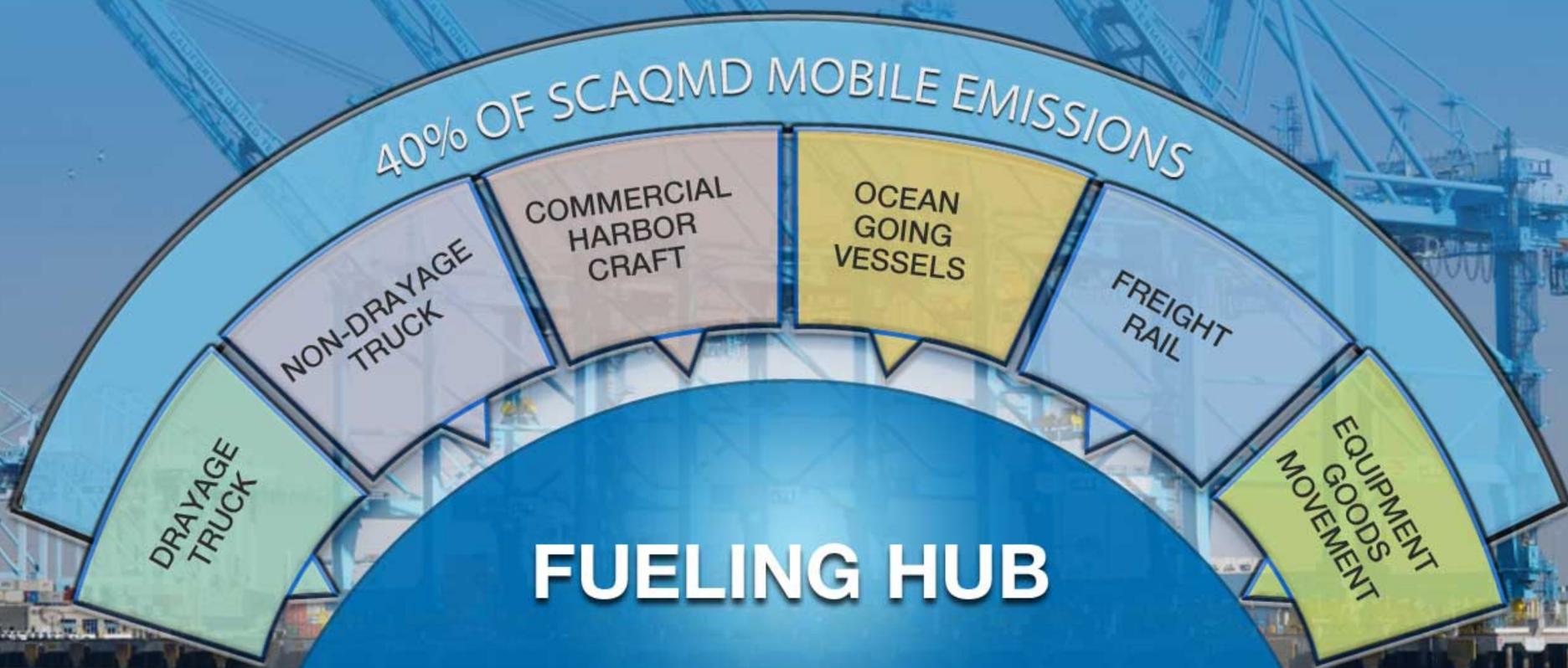
Meet 2023
Ozone Goal

*Larger Vessels Adopt LNG,
Cost Savings Continues*

*LNG Retrofits,
LNG Fueling Hubs*

Opportunity to Accelerate Emission Reductions through Fuel Conversion

Siting Natural Gas Infrastructure in Proximity to Other Fleets Can Speed Up Conversion to Lower Emission Vehicles: *Ports Example*



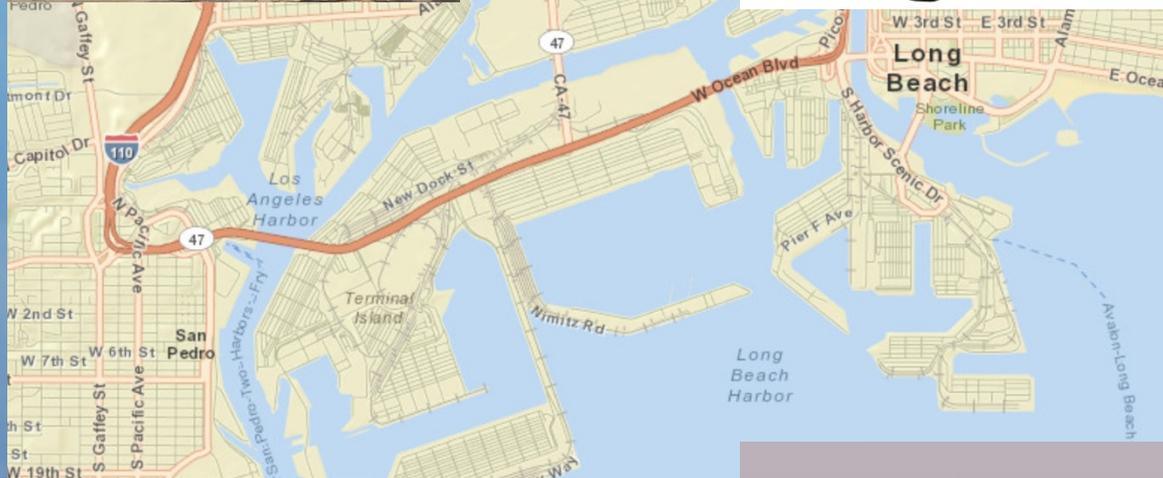
Intermodal Fueling Strategy

The Port Equipment/Natural Gas Nexus

LNG Switch Locomotive
~60,000 gal DGe/yr



LNG Drayage Tractor
~9,000 gal DGe/yr



LNG Container Ship (600 FEU)
9 million gal DGe/trip

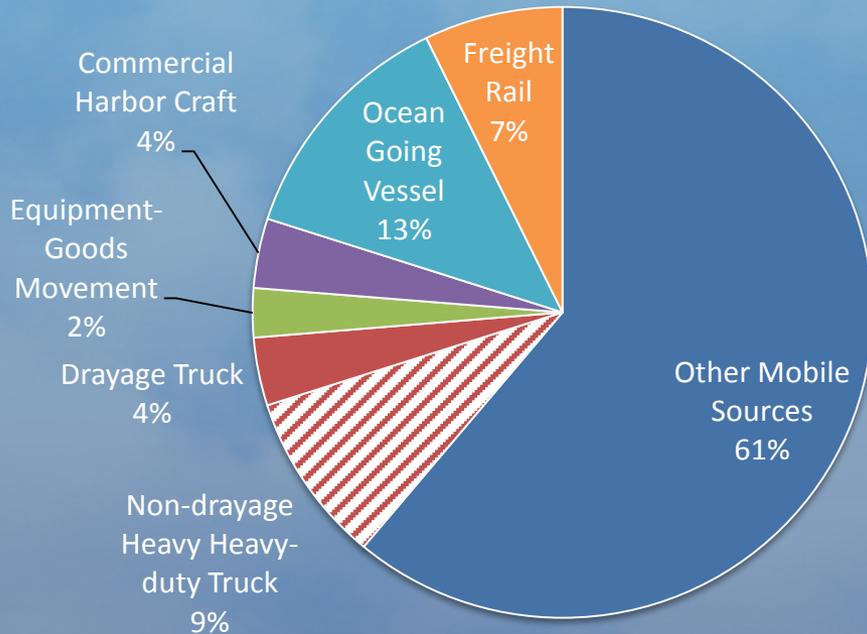
LNG Marine Tug
120,000 – 300,000 gal DGe/yr



*DGe = Diesel Gallons Equivalent; FEU = “forty-foot equivalent unit” sized container

An Intermodal Fueling Approach Can Accelerate Adoption of Cleaner Natural Gas Vehicles

2023 SC Air Basin Mobile NOx Inventory (250 tons/day total*)



*Based on SCAQMD 2012 AQMP inventory

Near Term Centralized Fueling Opportunity



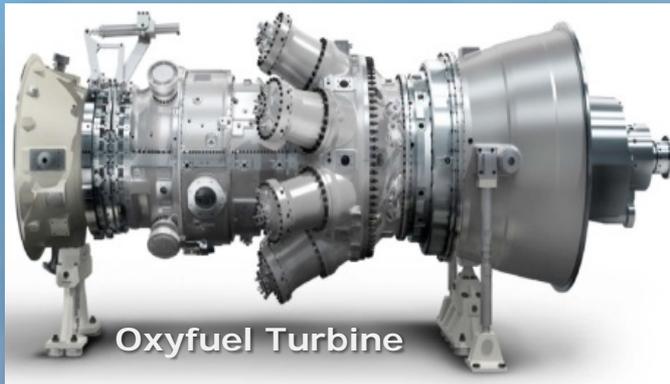


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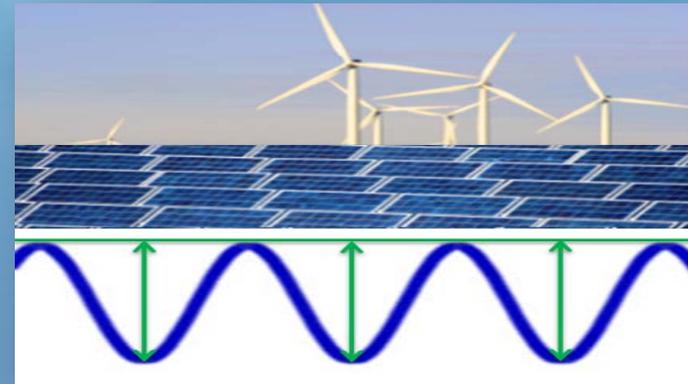
Decarbonizing the Natural Gas in the Pipeline

De-Carbonizing Electricity

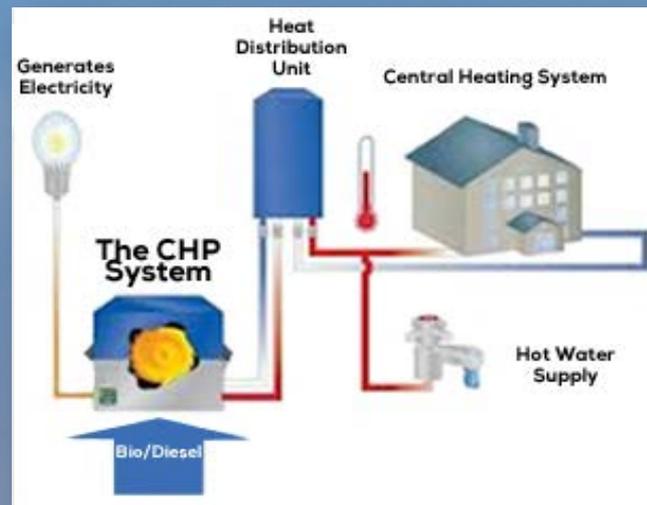
Power Generation with Carbon Capture



Small-scale Generation Matched with Renewables



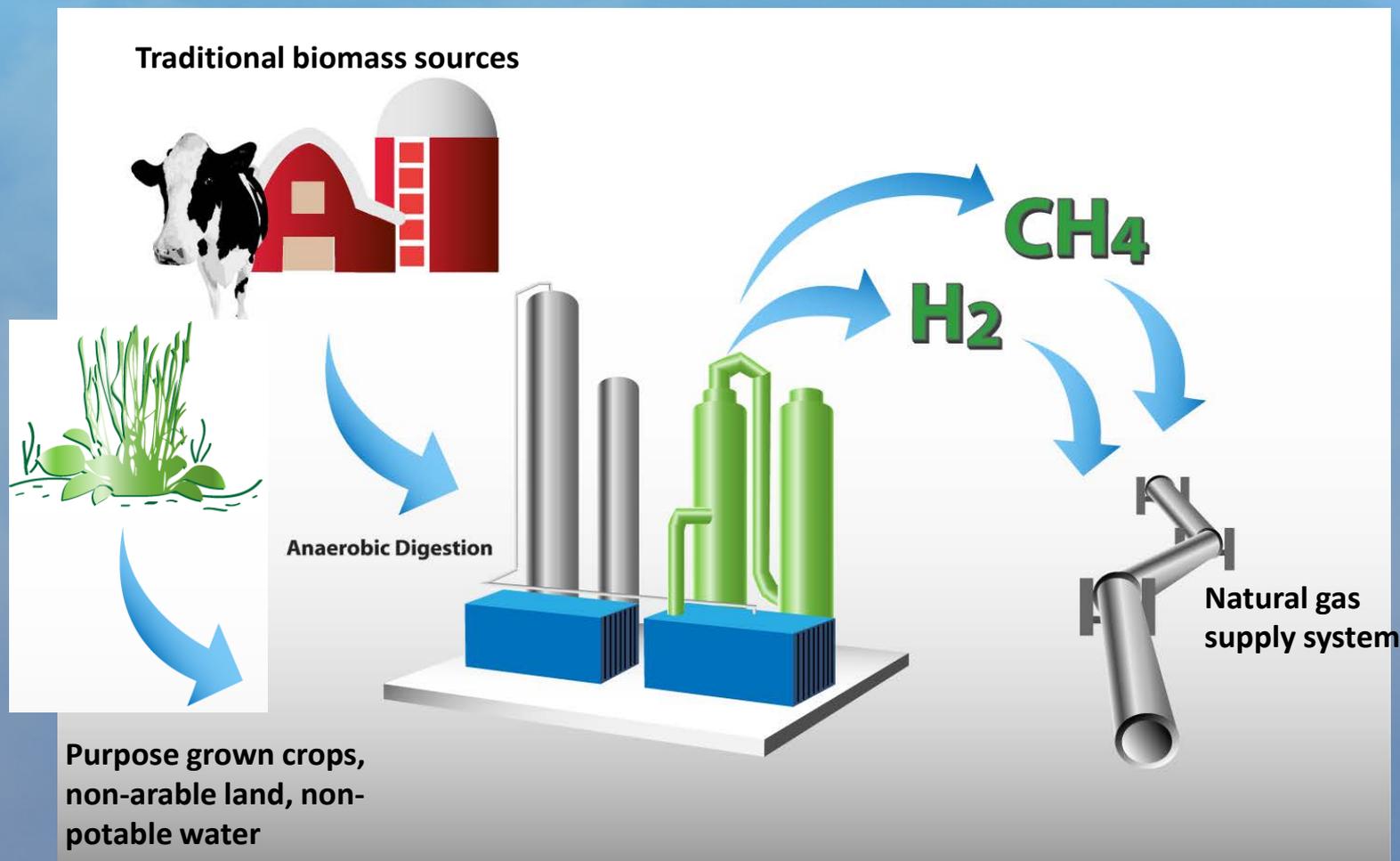
Distributed Generation



Not just rooftop solar...

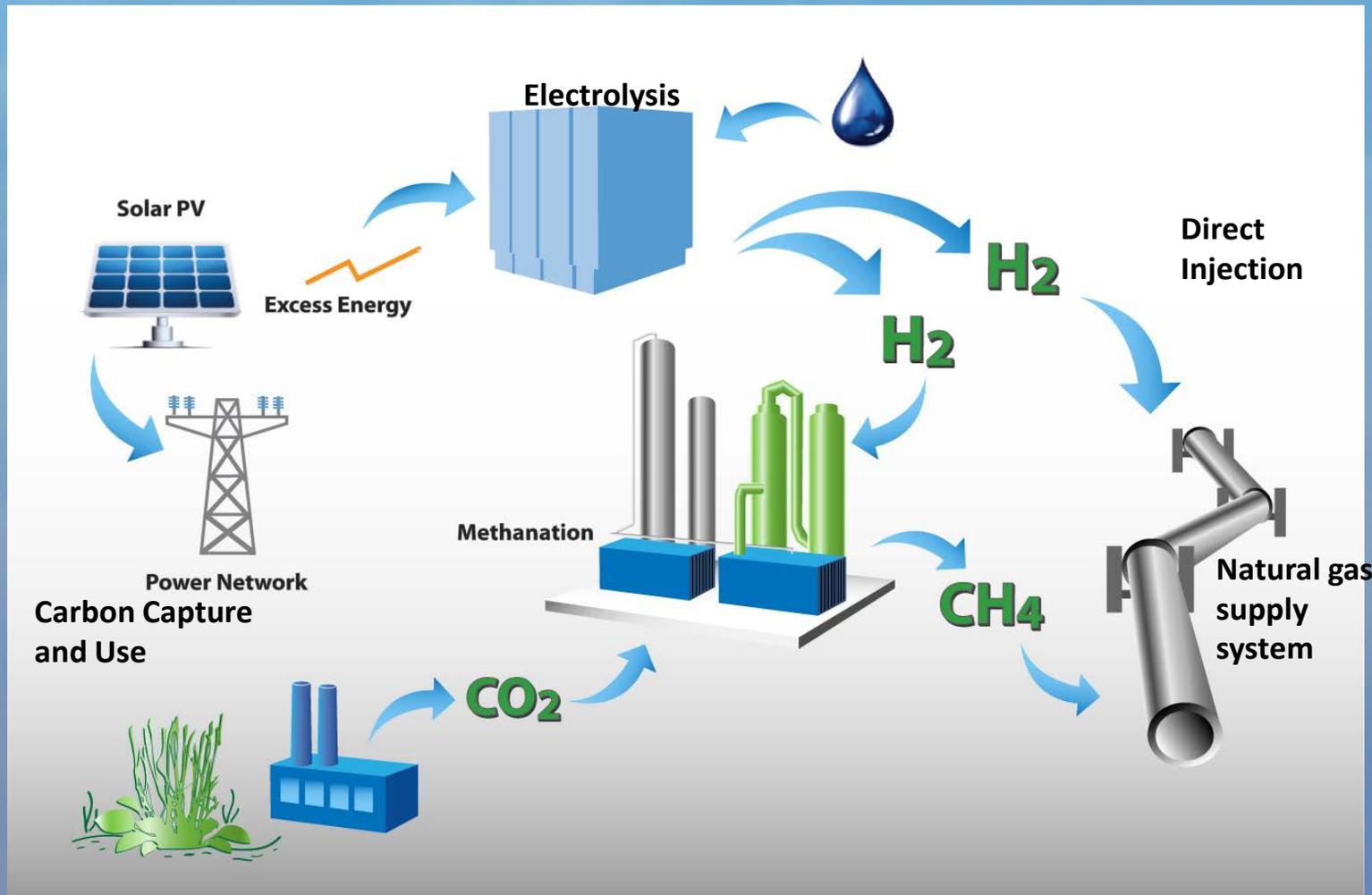
- Fuel Cells
- Microturbines
- Combined Heat & Power

De-Carbonizing the Pipeline: *Waste or Biomass To Hydrogen or Biomethane*



De-Carbonizing the Pipeline: *Electrolysis of Excess Renewable Electricity* (Power to Gas)

Supports the Move to More Renewable Generation



Power-to-Gas: Projects 30 Launched in Europe to Date



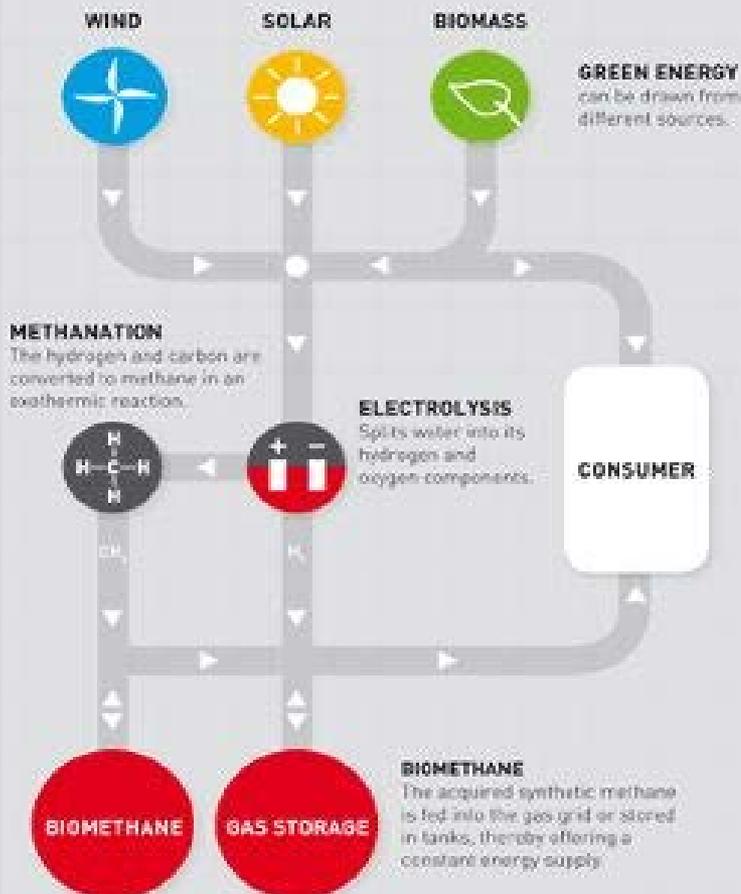
“... In certain parts of Europe we have the situation already where the generation of 'renewable' electricity from wind and solar energy has led ... to production plants being shut down because the electricity generated exceeds local requirements and the transportation or storage capacities are inadequate ... Projects are therefore being discussed in which the surplus electricity is used to power electrolyzers that will split water into its component parts, with the hydrogen being directly injected into natural gas pipelines for both storage and transportation. The concept has become known as "Power to Gas" or P2G.

It is becoming more widely accepted that hydrogen could become an important energy carrier in the energy mix in the quest for sustainability ... Indeed it's possible that, with the existing infrastructure, hydrogen/natural gas mixtures could be transported, stored ... where required...”

German Energy Agency on Power to Gas: "System Solution"

Power-to-Gas Technology

BREAKTHROUGH IN THE NATURAL ENERGY MARKET



DENA Website (German Energy Agency)

With the Power to Gas Strategy Platform, the Deutsche Energie-Agentur GmbH (dena) – the German Energy Agency – and its partners are supporting the use and development of the Power to Gas system solution.

CAISO (on the "Duck Curve")

...steps must be taken to mitigate over generation risk. These steps include increasing exports ... and requiring renewable generation curtailment. The ability to export power depends on the needs of neighboring entities ...The resource mix would also benefit from resources with energy storage capabilities...

SoCalGas Facilitating Cleaner Energy Options for our Customers



A Sempra Energy utility®

- **RD&D** of cleaner, more efficient **natural gas technologies**.
- New State **Natural Gas Utilization Policy**
- Offering **Compression Services** to facilitate development of NGV market.
- Offering **Biogas Conditioning Services** to facilitate development of renewable natural gas market.
- Proposing **Distributed Energy Services** tariff to facilitate more efficient use of heat and power.
- In the future, considering **LNG and/or Hydrogen Production Services** as energy economy moves to cleaner fuels.

