



Clean Transportation

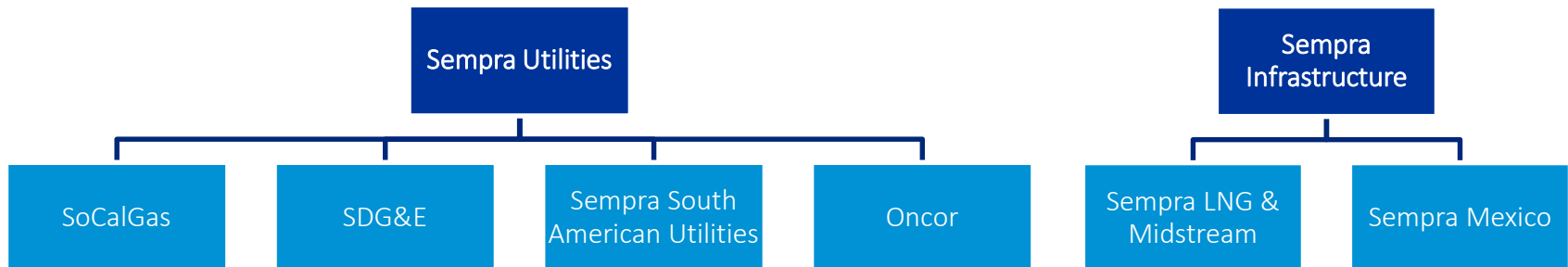
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Vice President, Federal Government Affairs

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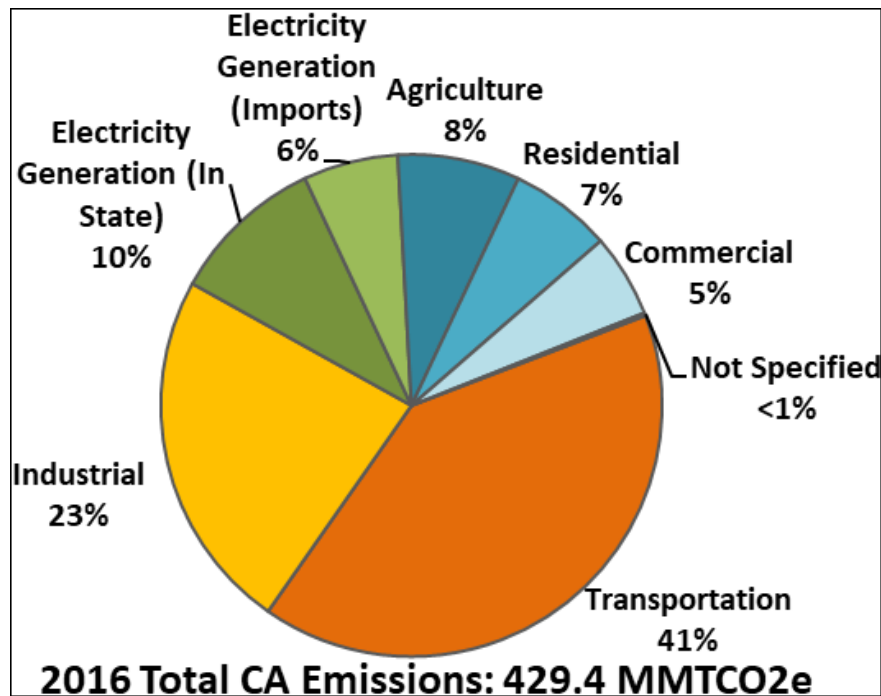
Overview of Sempra Energy

- Fortune 500 company headquartered in San Diego, California
- Over 20,000 employees worldwide
- Sempra Energy develops energy infrastructure, operates utilities and provides related products and services to more than 40 million consumers worldwide



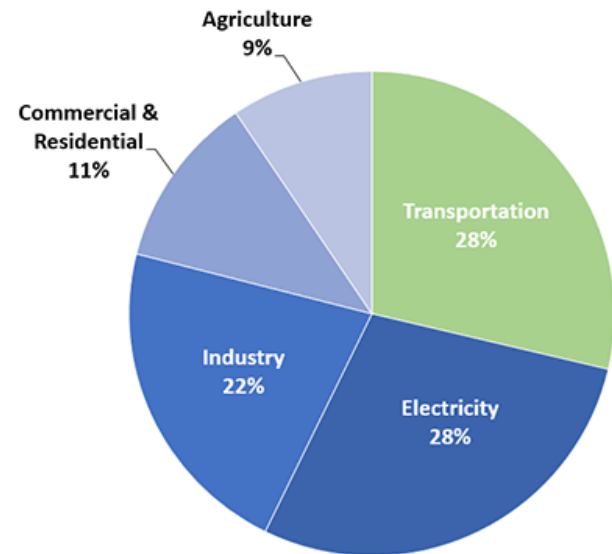
Clean Transportation

- The transportation sector accounts for a significant amount of GHG emissions in California and across the United States
- At Sempra Energy, we look at clean transportation from a variety of angles, including electric vehicles (EVs) and clean natural gas (CNG)



2018 Edition of the GHG Emission Inventory Released July 11, 2018

Total U.S. Greenhouse Gas Emissions by Economic Sector in 2016



U.S. Environmental Protection Agency (2018). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016

SDG&E and Electric Vehicles

2017 Electric Vehicle (PHEV and BEV) Sales and Market Share by State

State	EV Sales 2016	EV Sales 2017	% YOY Increase	2017 EV Market Share
California	73,854	94,873	28.50%	5.02%
Washington	5,363	7,068	31.80%	2.51%
Oregon	3,486	3,988	14.40%	2.36%
Hawaii	1,224	1,934	58.00%	2.33%
Vermont	514	871	69.50%	2.13%
District of Columbia	405	398	-1.70%	1.87%
Colorado	2,711	4,156	53.30%	1.57%
Connecticut	1,511	2,304	52.50%	1.39%

Source: Alliance of Auto Manufacturers, Advanced Technology Vehicles Sales Dashboard

- EVs are more accessible than ever to consumers across the country
- San Diego is currently ranked 6th in the nation for EV market share⁽¹⁾
- Infrastructure is a key driver to EV deployment, and SDG&E is leading the charge
- In 2017, SDG&E began construction and installation of 3,000 new EV charging stations in its service territory
- Currently 29,000 plug-in electric cars in service territory, goal of 500,000 zero emission vehicles by 2030

1) U.S. Department of Energy and National Renewable Energy Laboratory "National Plug-In Electric Vehicle Infrastructure Analysis" published in September 2017.

California Clean Transportation Investments



	SDGE	PG&E	SOUTHERN CALIFORNIA EDISON
Current Programs (in progress)	<ul style="list-style-type: none"> Power Your Drive: 3,000 L2 chargers at 300 locations (\$45M) <ul style="list-style-type: none"> MUDs & workplace Dealership incentives (\$1.8M) Electrify local highways (\$4M) Green shuttle (\$3.2M) Port of San Diego electrification (\$2.4M) Fleet delivery hub electrification (\$3.7M) Airport ground service equipment electrification (\$2.8M) 	<ul style="list-style-type: none"> EV Charge Network: 7,500 L2 chargers (\$130M) <ul style="list-style-type: none"> MUDs & workplace Home charger information resource (\$0.5M) MD/HD fleet demonstration (\$3.4M) Idle-reduction customer demonstration (\$1.7M) Electric school bus renewables integration (\$2.2M) FleetReady program: Make-ready for non-light-duty (\$236M) Fast charge make-ready infrastructure (\$22.4M) 	<ul style="list-style-type: none"> Charge Ready: 1,500 L2 chargers (\$22M) <ul style="list-style-type: none"> MUDs, workplace, public/retail Transit bus make-ready & rebate (\$4M) MD/HD make-ready infrastructure (\$343M) Residential make-ready installations (\$4M) DCFC cluster make-ready in urban areas (\$4M) Port of Long Beach rubber tire gantry/tractor electrification (\$4M)
Pending Programs	<ul style="list-style-type: none"> Residential Charging – 60,000 L2 chargers (\$142M) MD/HD infrastructure (\$150M) 		<ul style="list-style-type: none"> Charge Ready petition for modification bridge funding (\$22M) Charge Ready expansion (\$760M)
Future Filings	<ul style="list-style-type: none"> AB 1082/AB 1083 – infrastructure for schools, parks and beaches (TBD) 	<ul style="list-style-type: none"> AB 1082/AB 1083 – infrastructure for schools, parks and beaches (TBD) 	<ul style="list-style-type: none"> AB 1082/AB 1083 – infrastructure for schools, parks and beaches (TBD)

\$355M*

\$396M*

\$1.16B*

~Total Investment = \$1.9B*

SoCalGas and Clean Natural Gas as a Fuel

- Natural gas vehicles are key to cleaning up the heavy-duty transportation sector, including fleet and heavy-duty vehicles as well as marine vessels
- SoCalGas has worked with partners to develop a near-zero-NOx emissions heavy-duty engine fueled by natural gas. The engine, the first of its kind, was deployed commercially in 2016
- Clean Natural Gas (CNG) trucks can reduce nitrogen oxide emissions 90% below California Air Resources Board 2010 emissions standards, and reduce GHG emissions by 15%
- Goal of facilitating the conversion of 160,000 heavy-duty trucks from diesel to natural gas by 2030



Technology's Impact on Clean Transportation

- Advancement in technology continues to be a key factor in the evolution of clean transportation
- The concept of the electric vehicle actually originated more than 100 years ago, before the combustible engine
- Recent advancements have enabled a rebirth for EVs and has led to rapidly declining costs, helping spur greater performance and lower cost for electric vehicles in general
- Concepts like ride-sharing have changed the way society approaches transportation and urban congestion, leading to greater environmental benefits in the long term



Thomas Edison and an electric car

Benefits & Challenges and How Sempra is Addressing Them

- In addition to environmental benefits, the U.S. is witnessing a reinvigoration in the technology sector, growth in manufacturing, overall job growth and an economic resurgence
- Increased renewable and technological advances in battery storage are allowing our utility SDG&E to better manage the “duck curve”
- Challenges include grid management and modernization: a “smarter” and more resilient grid can be achieved through the use of cutting-edge technologies, equipment, and controls that communicate and work together to deliver electricity more reliably and efficiently
- If consumers have access to their own data, they can better manage their own energy consumption and costs
- Utilities also benefit from a modernized grid, including improved security, reduced peak loads, increased integration of renewables, and lower operational costs.
- And this effort must be done in a way that not encourages continued advances in technology, and does not overly burden customers with ever-increasing energy bills