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Transportation Energy Demand Forecast
2020 IEPR Update

2020 IEPR Workshop
December 3, 2020

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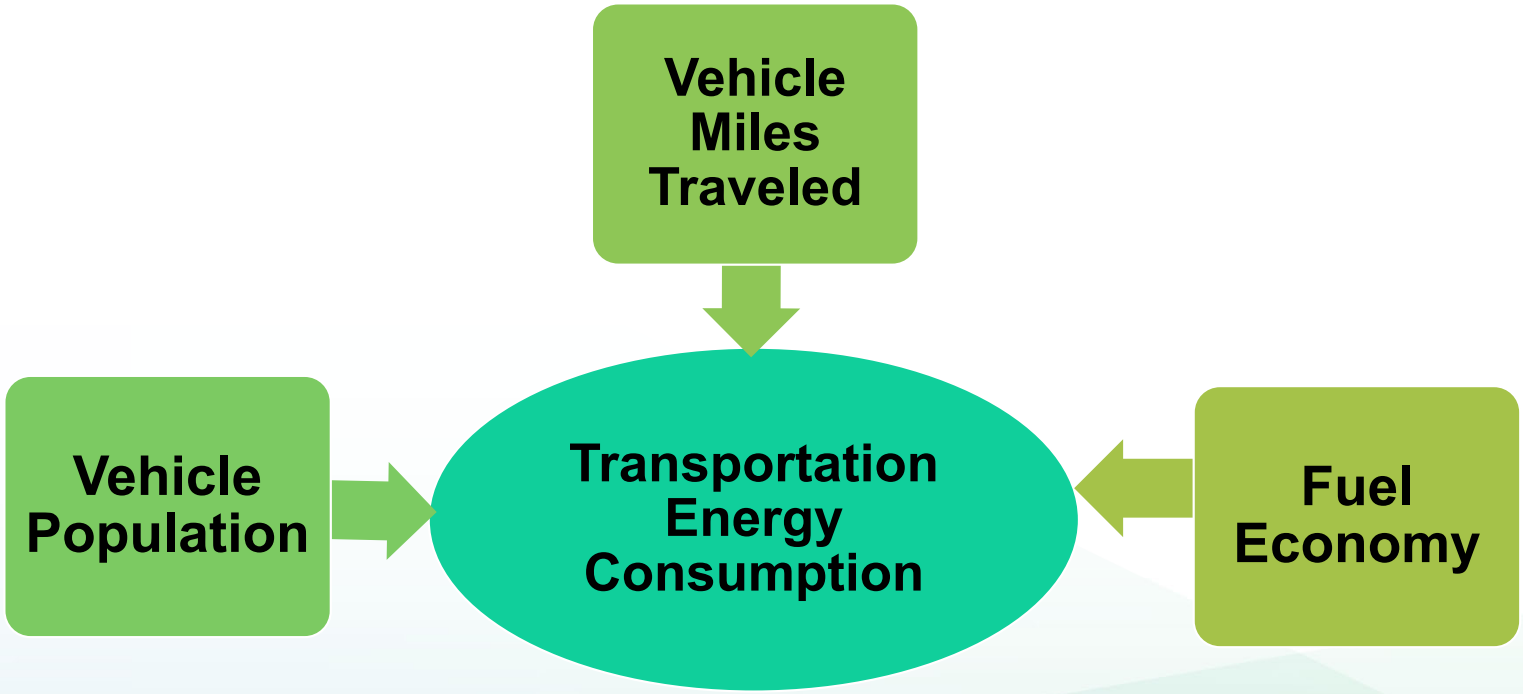
Overview

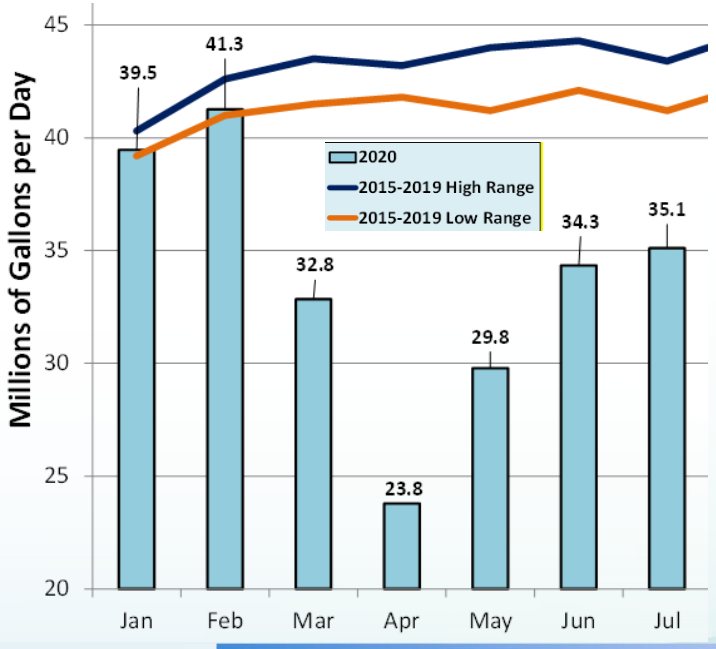
- COVID 19 Impact on 2020 Fuel Consumption
- Models & Scenarios
- Transportation Energy Demand by Fuel & Vehicle Type
- ZEV Transportation Energy Demand Forecasts
- Other Transportation Energy Demand Forecasts (Appendix)
- Transportation Energy prices (Appendix)

Transportation Energy Consumption

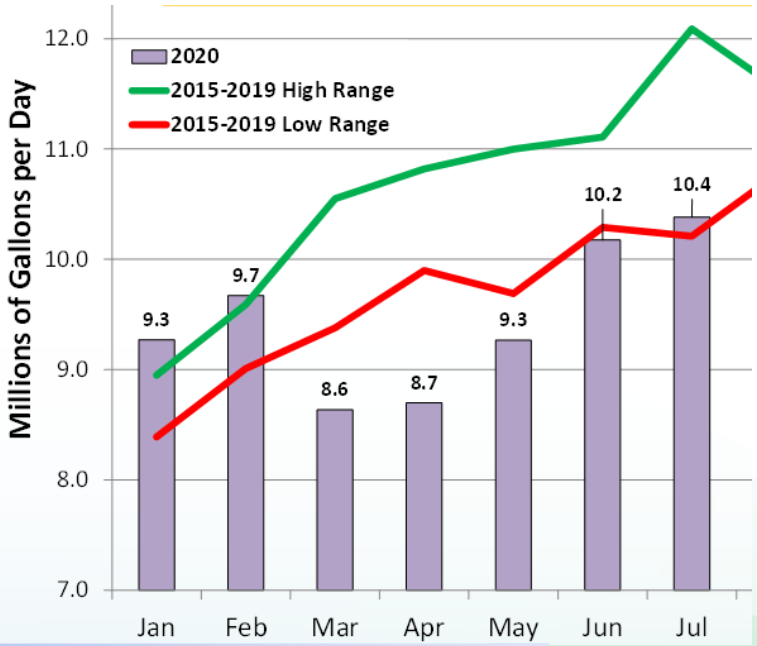


2020 Monthly Fuel Consumption: COVID Impact

Gasoline

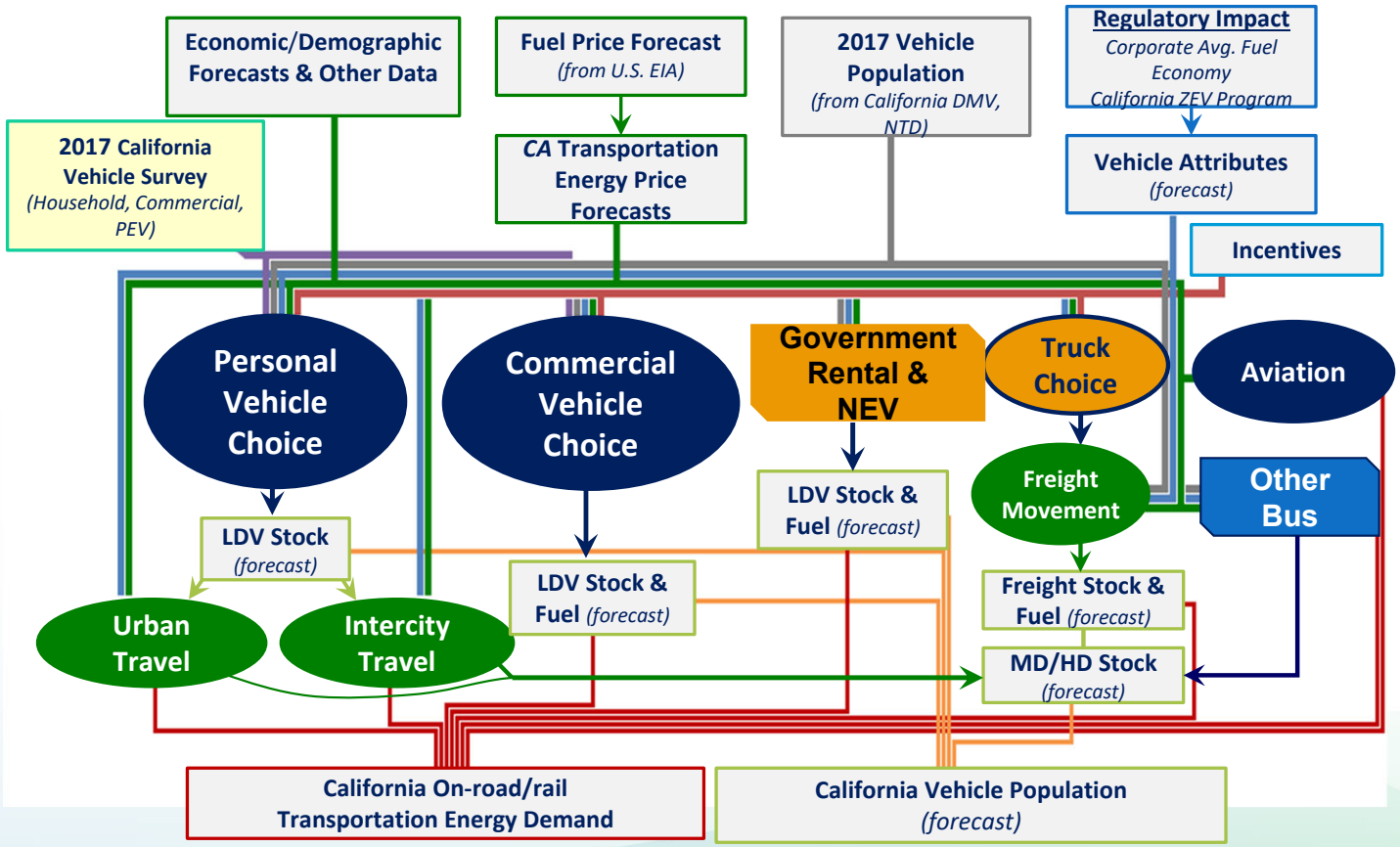


Diesel



Source: California Energy Commission analysis of CDTFA data, Graphs adapted from Gordon Schremp Presentation at Office of Spill Prevention and Response. November 5, 2020.

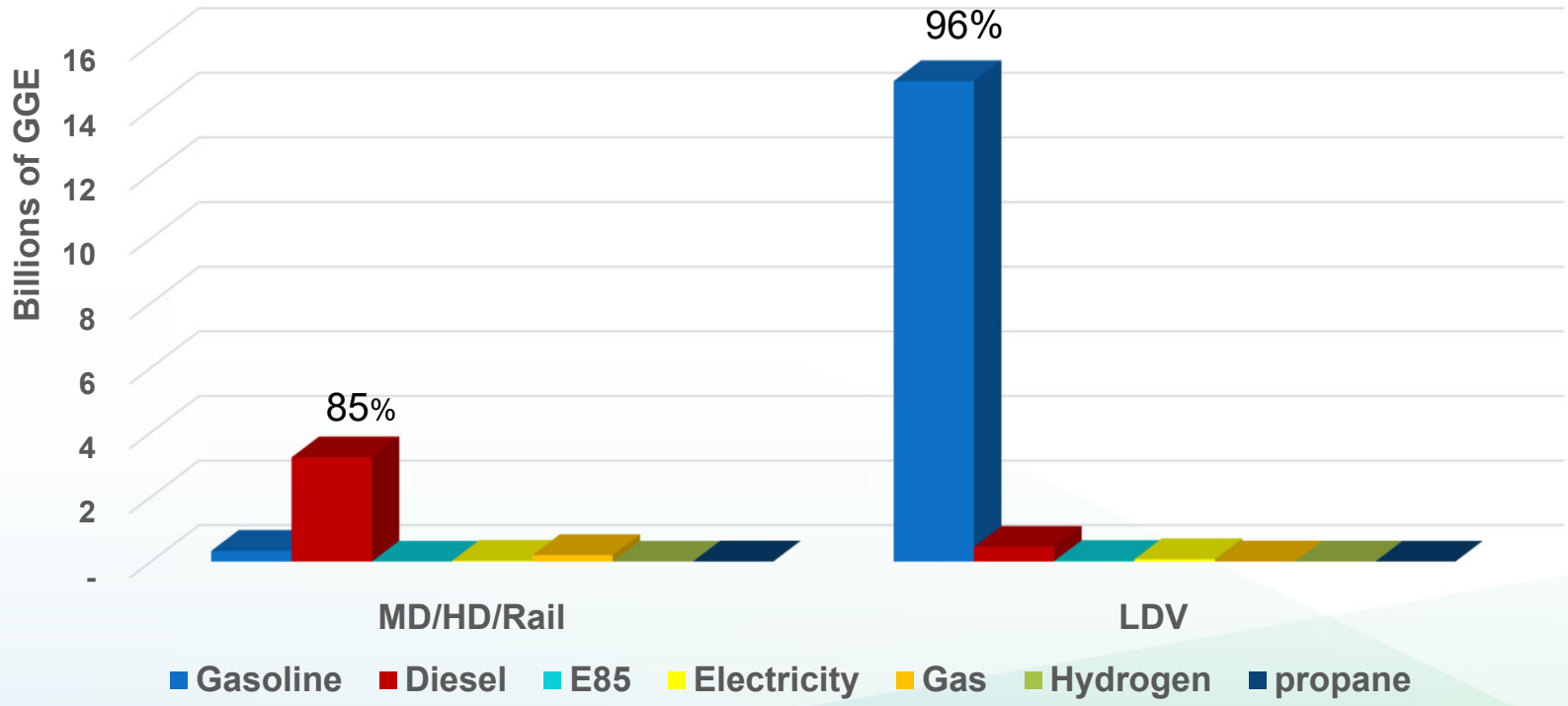
Energy Commission's Transportation Energy Demand Forecasting Models



Demand Forecasting Scenarios are Electricity-Based

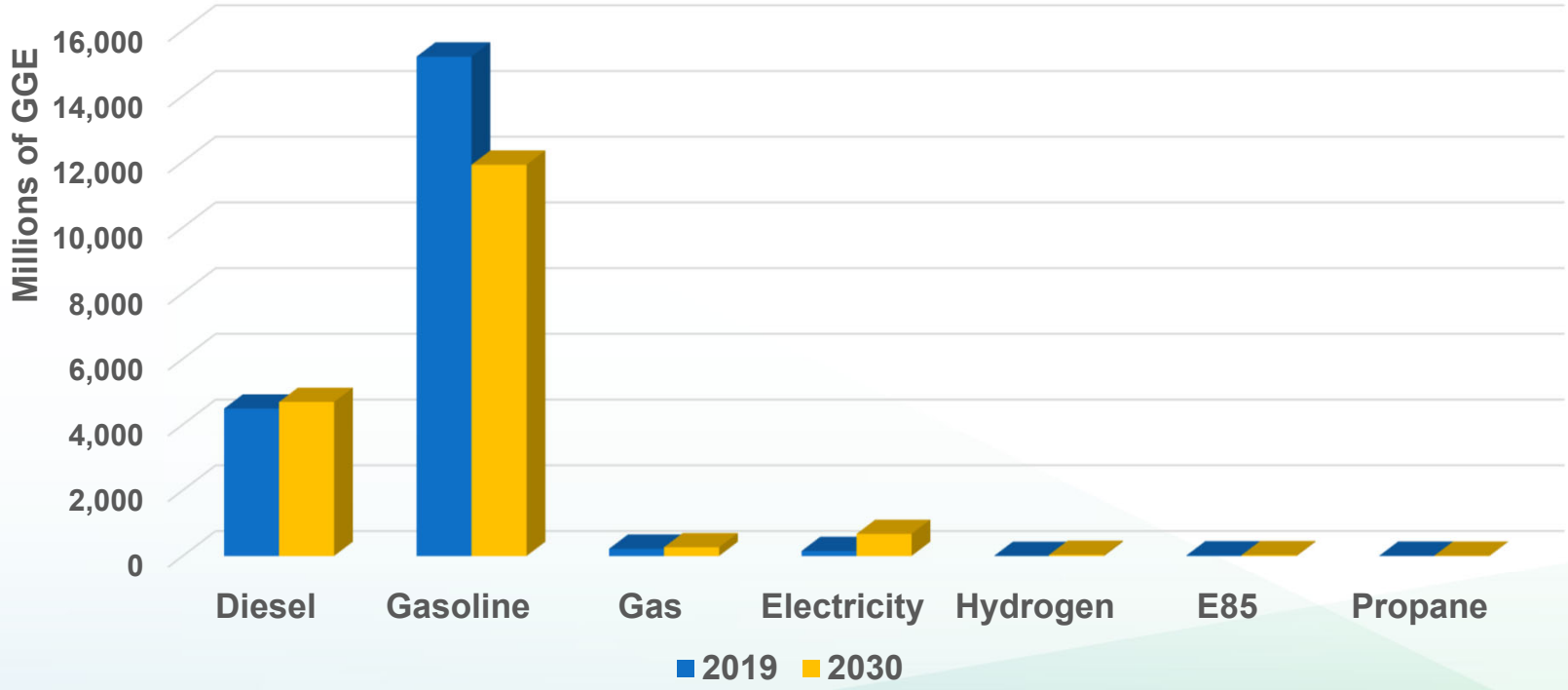
Demand Case	Population Growth	Income Growth	Fuel Prices	
			Petroleum Fuels	Electricity, (Pipeline) Gas, Hydrogen
High Demand	High	High	High	Low
Mid Demand	Mid	Mid	Mid	Mid
Low Demand	Low	Low	Low	High

2019 Transportation Energy Distribution by Fuel Type and Vehicle Type



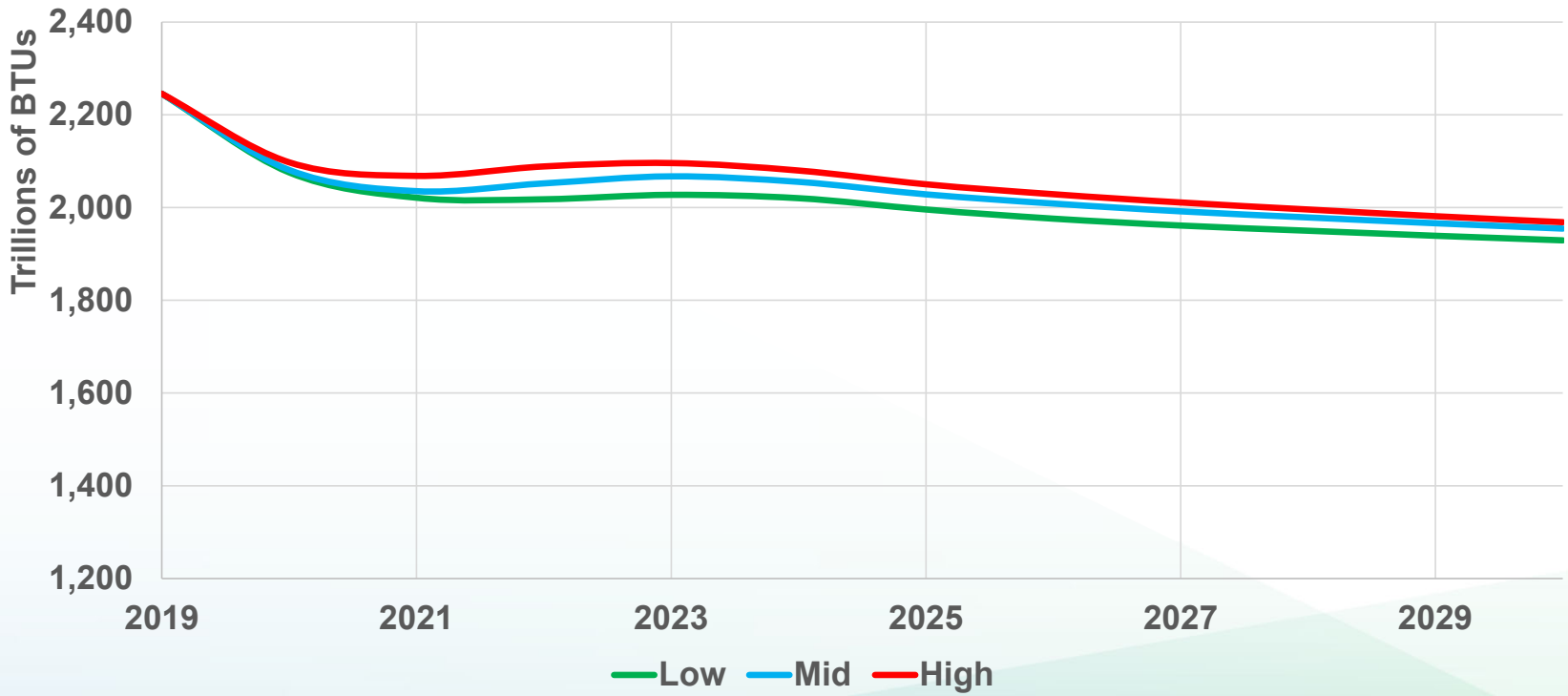
Source: Energy Commission Staff Analysis

Transportation Energy Demand Forecast by Fuel Type: 2019 vs 2030 High Demand Case



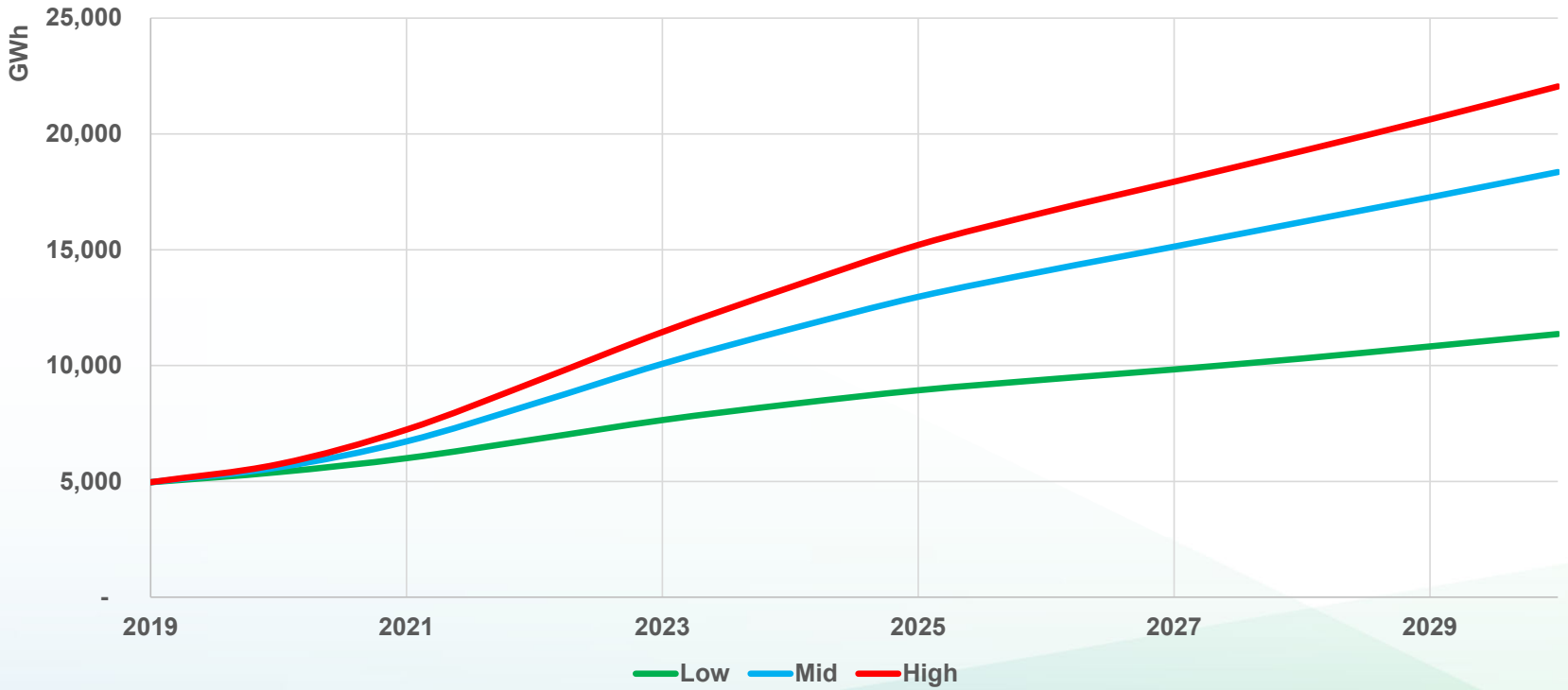
Source: Energy Commission Staff Analysis

Total Transportation Energy Demand Forecast



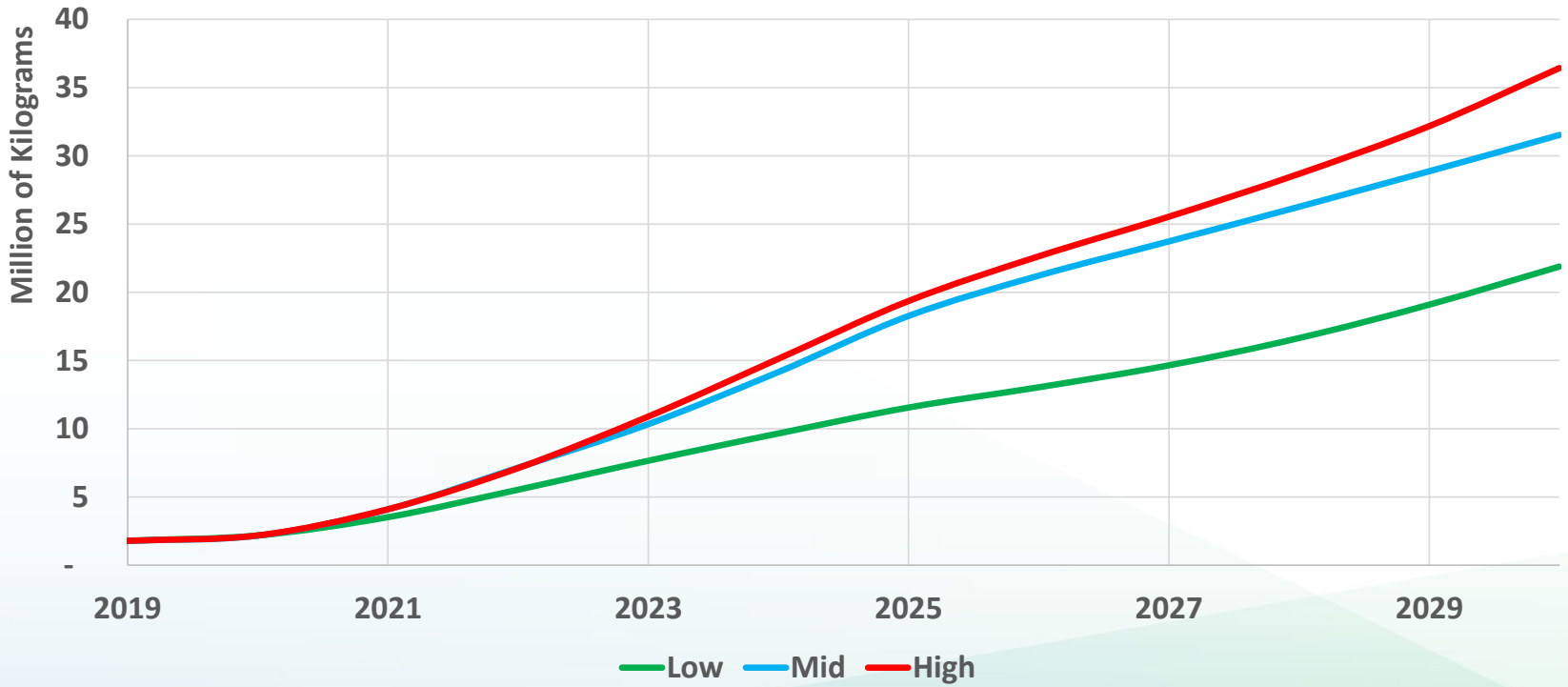
Source: Energy Commission Staff Analysis

Transportation Electricity Demand Forecast



Source: Energy Commission Staff Analysis

Transportation Hydrogen Demand Forecast



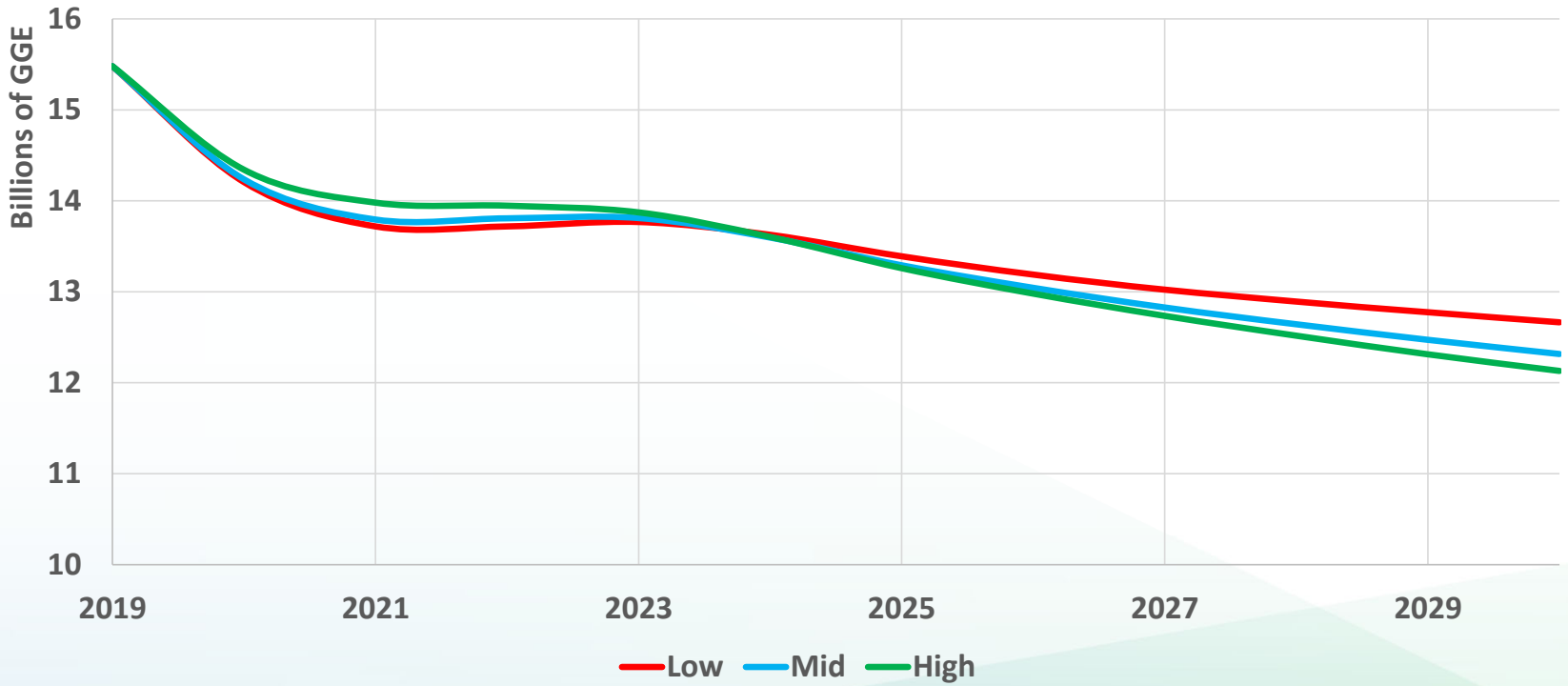
Source: Energy Commission Staff Analysis

Transportation Forecasting Team

- **Heidi Javanbakht (Unit Supervisor)**
- **Aniss Bahreinian**
- **Jesse Gage: DMV Analyst, Government and Rental LDV Forecast**
- **Elena Giyenko: Other Bus Forecast**
- **Alexander Lonsdale: EV Load Shape Forecast**
- **Bob McBride: Truck Choice and Freight, MD/HD Forecast**
- **Mark Palmere: LDV Forecast**
- **Elizabeth Pham: ZEV Portal**
- **Ysbrand van der Werf: Fuel Price Forecast, Urban/Intercity Travel**

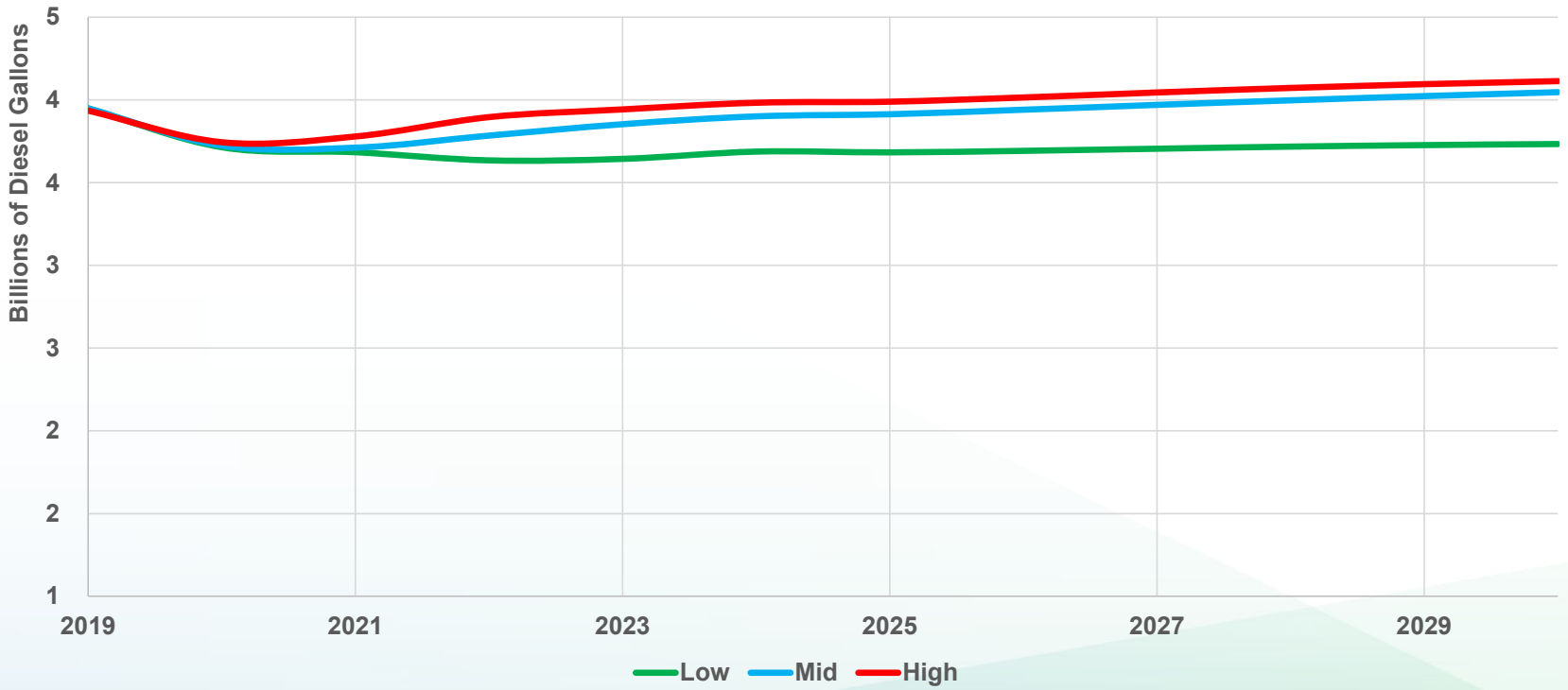
Appendices

Gasoline Demand Forecast



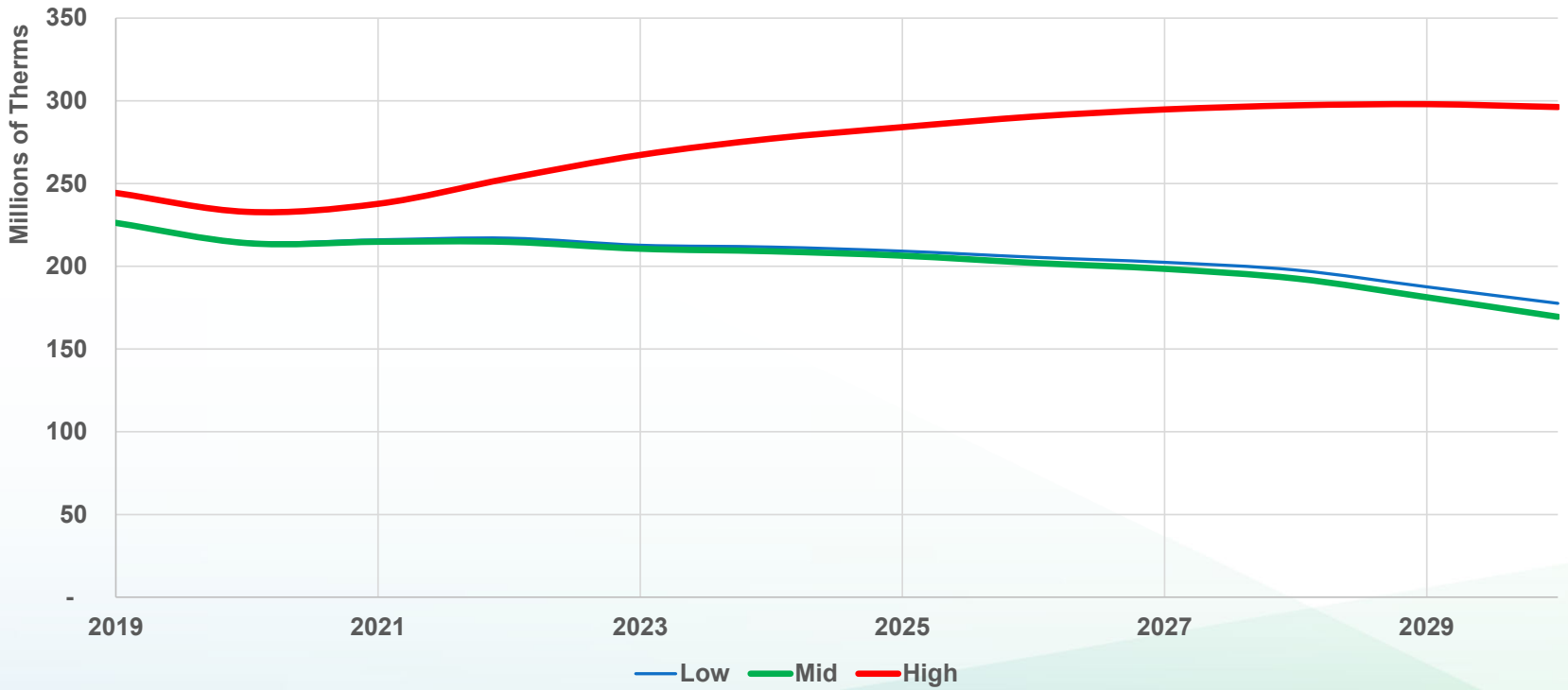
Source: Energy Commission Staff Analysis

Diesel Demand Forecast



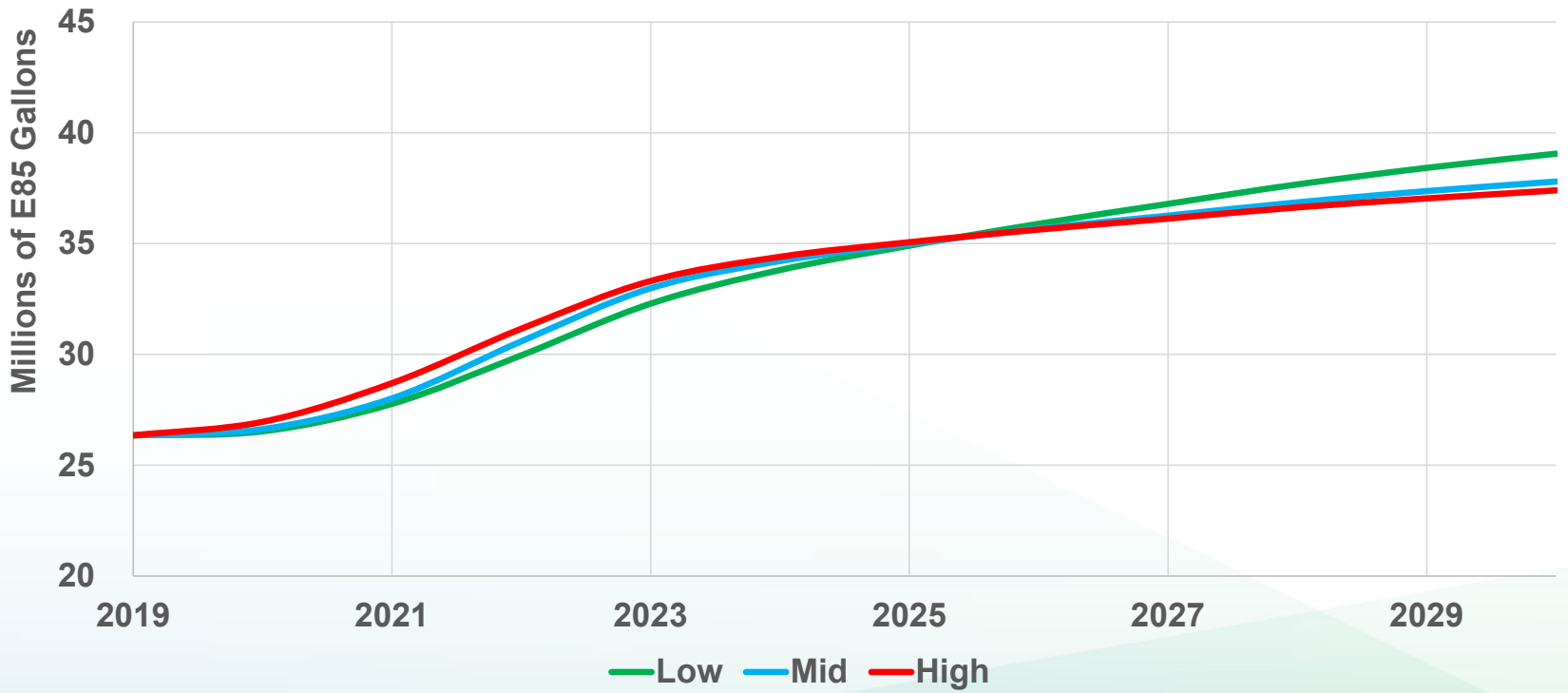
Source: Energy Commission Staff Analysis

Transportation Gas Demand Forecast



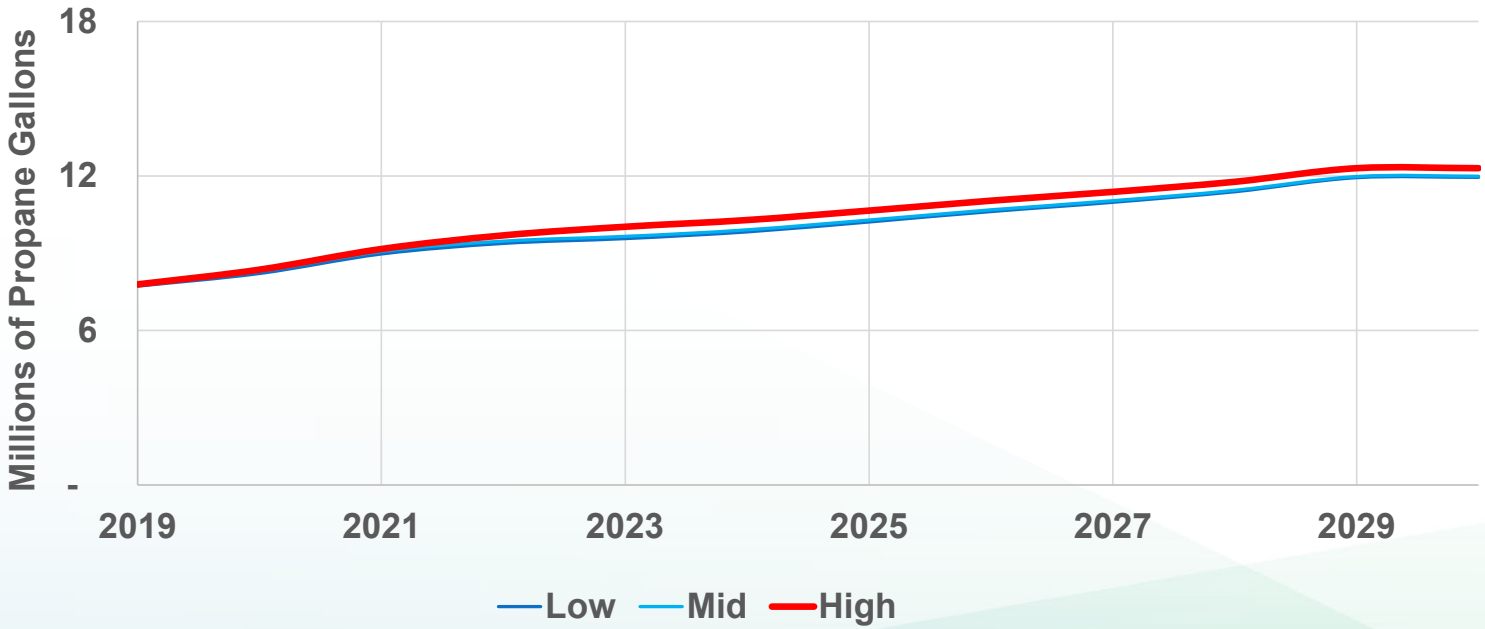
Source: Energy Commission Staff Analysis

Ethanol (E85) Demand Forecast



Source: Energy Commission Staff Analysis

Transportation Propane Demand Forecast



Source: Energy Commission Staff Analysis

Transportation Energy Price Forecast

California 2020 Fuel Price Forecasts, $2019

California Gasoline

Year	$/GGE Low Electricity Demand	$/GGE Mid Demand	$/GGE High Electricity Demand
2019	$3.68	$3.68	$3.68
2020	$3.59	$3.59	$3.59
2021	$2.29	$2.77	$3.23
2022	$2.27	$2.76	$3.37
2023	$2.25	$2.74	$3.57
2024	$2.22	$2.70	$3.66
2025	$2.20	$2.71	$3.70
2026	$2.20	$2.70	$3.76
2027	$2.20	$2.71	$3.76
2028	$2.19	$2.69	$3.80
2029	$2.18	$2.69	$3.91
2030	$2.22	$2.73	$3.92

California Diesel

Year	$/DGE Low Electricity Demand	$/DGE Mid Demand	$/DGE High Electricity Demand
2019	$3.92	$3.92	$3.92
2020	$3.83	$3.83	$3.83
2021	$2.42	$2.90	$3.60
2022	$2.45	$2.91	$3.79
2023	$2.43	$2.89	$4.04
2024	$2.44	$2.89	$4.14
2025	$2.44	$2.85	$4.21
2026	$2.43	$2.85	$4.25
2027	$2.42	$2.79	$4.20
2028	$2.40	$2.75	$4.20
2029	$2.39	$2.69	$4.30
2030	$2.42	$2.65	$4.24

Source: Energy Commission Staff Analysis

California 2020 Fuel Price Forecasts, $2019

Electricity Commercial Rates	$/GGE	$/GGE	$/GGE
Year	Low Electricity Demand	Mid Demand	High Electricity Demand
2019	$5.54	$5.54	$5.54
2020	$5.78	$5.78	$5.78
2021	$6.08	$5.93	$5.86
2022	$6.22	$6.03	$5.86
2023	$6.15	$5.99	$5.73
2024	$6.20	$5.99	$5.68
2025	$6.43	$6.16	$5.79
2026	$6.63	$6.29	$5.85
2027	$6.79	$6.39	$5.87
2028	$6.97	$6.52	$5.90
2029	$7.17	$6.63	$5.92
2030	$7.36	$6.75	$5.94

Electricity Residential Rates	$/GGE	$/GGE	$/GGE
Year	Low Electricity Demand	Mid Demand	High Electricity Demand
2019	$6.24	$6.24	$6.24
2020	$6.50	$6.50	$6.50
2021	$6.90	$6.75	$6.67
2022	$7.13	$6.93	$6.73
2023	$7.09	$6.92	$6.62
2024	$7.13	$6.91	$6.55
2025	$7.37	$7.07	$6.64
2026	$7.55	$7.18	$6.67
2027	$7.69	$7.25	$6.66
2028	$7.85	$7.35	$6.66
2029	$8.04	$7.44	$6.66
2030	$8.22	$7.54	$6.64

Hydrogen	$/GGE	$/GGE	$/GGE
Year	Low Electricity Demand	Mid Demand	High Electricity Demand
2019	$16.55	$16.55	$16.55
2020	$16.00	$16.00	$16.00
2021	$14.87	$15.46	$16.06
2022	$14.03	$14.91	$15.81
2023	$13.19	$14.37	$15.57
2024	$12.35	$13.82	$15.33
2025	$11.51	$13.28	$15.08
2026	$10.67	$12.73	$14.84
2027	$9.83	$12.19	$14.59
2028	$8.99	$11.64	$14.35
2029	$8.15	$11.10	$14.10
2030	$7.31	$10.55	$13.86

Source: Energy Commission Staff Analysis

Note that a hydrogen price of $5.86/GGE ($6.50/kg) was used in the MD-HD high case, representing a right-sized station for a dedicated fleet

California 2020 Fuel Price Forecasts, $2019

Propane for Transportation

Year	$/GGE Low Electricity Demand	$/GGE Mid Demand	$/GGE High Electricity Demand
2019	$1.94	$1.94	$1.94
2020	$1.93	$1.93	$1.93
2021	$1.84	$2.01	$2.17
2022	$1.86	$2.09	$2.35
2023	$1.89	$2.14	$2.54
2024	$1.92	$2.19	$2.72
2025	$1.95	$2.27	$2.91
2026	$1.98	$2.34	$3.08
2027	$1.99	$2.38	$3.21
2028	$1.99	$2.40	$3.29
2029	$1.99	$2.41	$3.40
2030	$2.03	$2.47	$3.44

Pipeline Gas for Transportation

Year	$/**GGE** Low Electricity Demand	$/**GGE** Mid Demand	$/**GGE** High Electricity Demand
2019	$2.01	$2.01	$2.01
2020	$2.01	$2.01	$2.01
2021	$1.99	$2.01	$2.02
2022	$1.99	$2.00	$2.02
2023	$1.99	$2.00	$2.01
2024	$1.99	$2.00	$2.01
2025	$1.98	$2.00	$2.01
2026	$1.98	$1.99	$2.01
2027	$1.98	$1.99	$2.00
2028	$1.97	$1.99	$2.00
2029	$1.97	$1.99	$2.00
2030	$1.97	$1.98	$2.00

Pipeline Gas for Transportation

Year	$/**DGE** Low Electricity Demand	$/**DGE** Mid Demand	$/**DGE** High Electricity Demand
2019	$2.33	$2.33	$2.34
2020	$2.33	$2.33	$2.33
2021	$2.31	$2.33	$2.34
2022	$2.31	$2.33	$2.34
2023	$2.31	$2.32	$2.34
2024	$2.31	$2.32	$2.34
2025	$2.30	$2.32	$2.33
2026	$2.30	$2.31	$2.33
2027	$2.29	$2.31	$2.33
2028	$2.29	$2.31	$2.32
2029	$2.29	$2.30	$2.32
2030	$2.29	$2.30	$2.32

Source: Energy Commission Staff Analysis