

*Juan Garcia*  
*18-10-7*



Cutting Services

PG CUTTING SERVICES

AB398 PROPOSED REGULATIONS CASE STUDY: SMALL BUSINESS CONSTRUCTION

Prepared by:



ANDREW CHANG & CO, LLC

December 2018

## Current Situation

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- In 2017, California's Assembly Bill 398 passed to re-authorize the continuation of the cap-and-trade program. AB 398 has two provisions to help contain costs of California's climate change programs:
    - California Air Resources Board (CARB) must establish a price ceiling on cap-and-trade allowance prices; and
    - CARB must set two intermediary containment prices (speed bump prices) at which allowances would be available for sale.
- CARB is currently in the process of considering new regulations to operationalize those provisions of AB 398.
- Western States Petroleum Association retained National Economic Research Associates (NERA) to develop a proprietary economic model to assess the impact of proposed greenhouse gas policies on the California economy. NERA undertook a study using their proprietary New-ERA modeling system to estimate the economic impacts of different ranges of values for these prices, with 6 scenarios in total, which are detailed in Appendix B. All scenarios include a suite of the California specific complementary measures, and the cap & trade program with a 2030 target of 40% below the 1990 level GHG emissions. To illustrate the impact of these proposed new regulations, the NERA analysis was utilized to estimate the impact on PG Cutting Services, a small business within California's construction industry.
  - Our approach may tend to underestimate actual costs of AB 398 on PG Cutting Services, perhaps significantly:
    - The approach assumes a baseline cost that is stagnant to 2017 utilization of energy. It does not factor growth of the company over the analysis period. By context, PG Cutting Services' revenues have been growing by 33% per annum between 2017 and 2019.
    - The approach does not factor capital costs imposed by increased GHG standards. PG Cutting Services reports that past regulations have necessitated the acquisition of new equipment to meet the new air quality standards and backup equipment due to lower reliability of some new equipment as a result of new regulations.
  - California had 68,900 construction firms, with 91% of them being small businesses. Construction contributed to \$107.5 billion (3.9%) of California's GDP of \$2.7 trillion. Private nonresidential spending totaled \$30.1 billion, while state and local spending totaled \$30.3 billion. Construction employment in August 2018 totaled 855,700.

<sup>1</sup> Associated General Contractors of America, "The Economic Impact of Construction in the United States and California," [https://files.agc.org/files/economic\\_state\\_facts/Castlm.pdf](https://files.agc.org/files/economic_state_facts/Castlm.pdf)

## About PG Cutting Services

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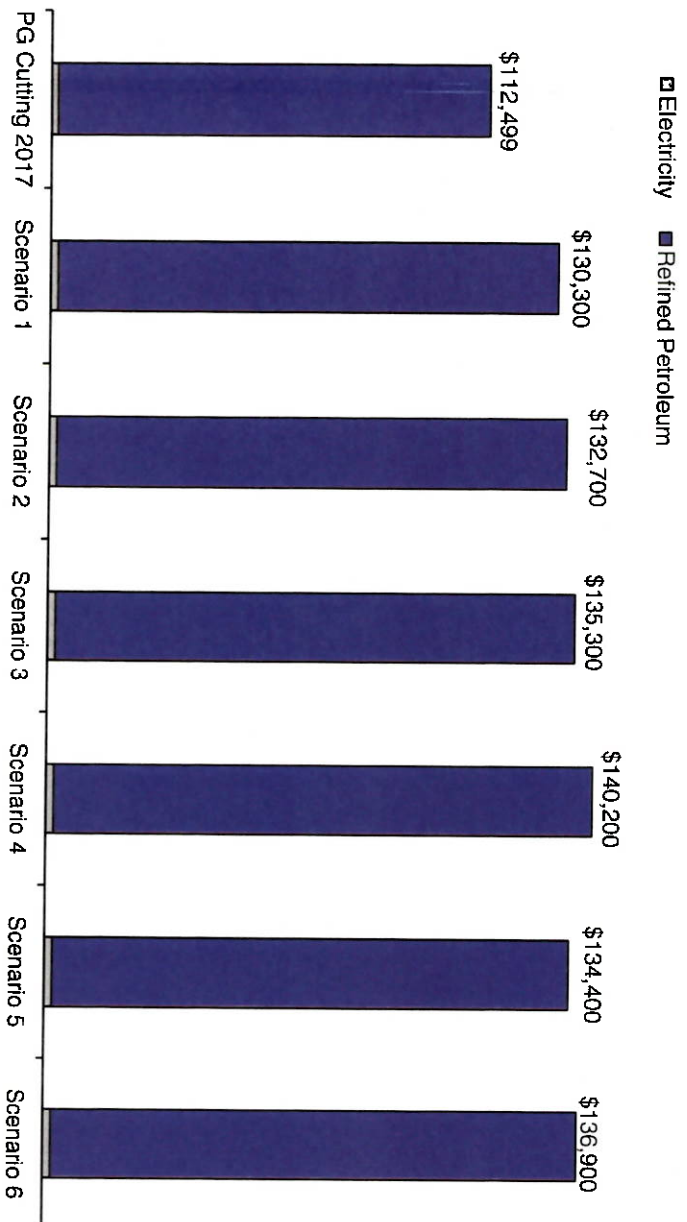


- PG Cutting Services is a small, family-owned and operated business based in Lake Elsinore, California that started in 2005. Starting with one truck and two saws, it has been in business for 13 years and currently employs 23 individuals. PG Cutting Services believes that its success is in large part due to its successful track record of reliability, safety and competitive pricing. <sup>2</sup>
- PG Cutting Services works in the concrete/asphalt cutting industry, working with those and drilling projects ranging from simple residential work to major construction of freeways, dams, airports, and commercial buildings. It largely operates as a subcontractor for concrete cutting and coring jobs in the Los Angeles area.
- PG Cutting Services is highly dependent on gas and diesel fuels to power their vehicles and on-site electricity generators. PG Cutting Services is also dependent on electricity in its administrative offices.

<sup>2</sup> PG Cutting Services, "About Us," <http://www.pgcutting.com/about%20us.html>

# Proposed regulations are projected to increase PG Cutting Services' average annual energy costs by 16% to 25%

## Average Annual Energy Costs (2019 – 2031) (\$2017)

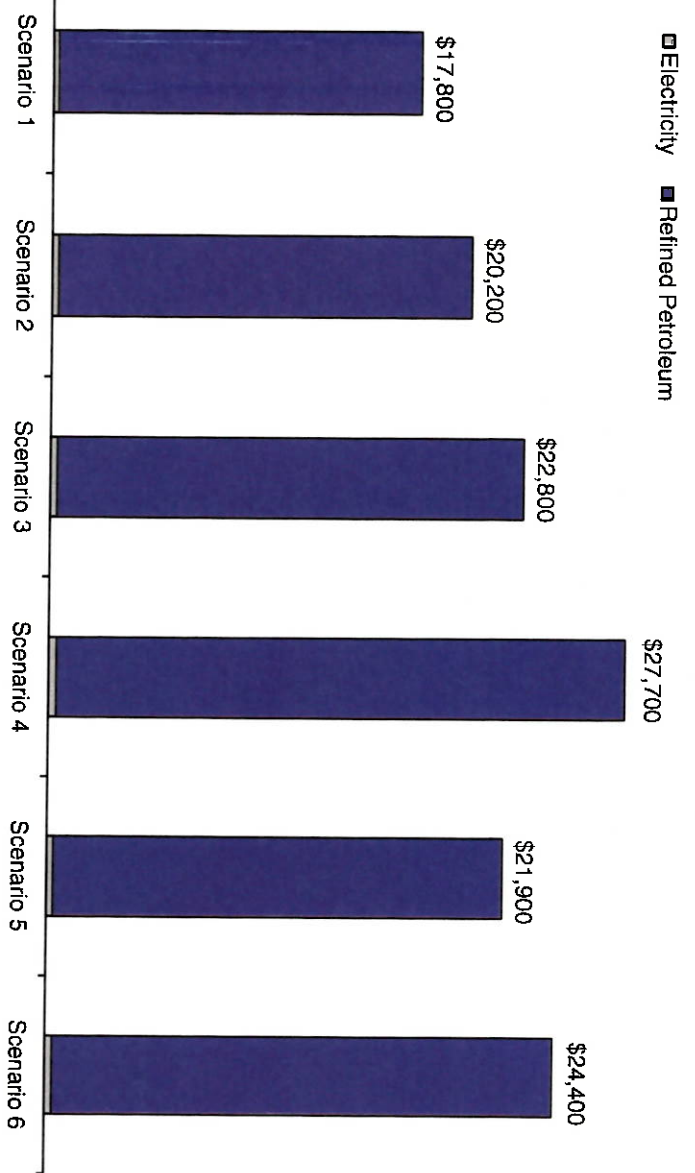


## Key Observations

- PG Cutting Services expended over \$112,000 in 2017 on petroleum based fuels and electricity.
- Based on NERA's analysis of the proposed regulations, PG Cutting Services would expend between \$130,000 and \$140,000 a year for their total energy costs.

# Proposed regulations are projected to increase PG Cutting Services' average annual energy costs by \$18K to \$28K

Average Annual Energy Cost Increases (2019 – 2031) (\$2017)



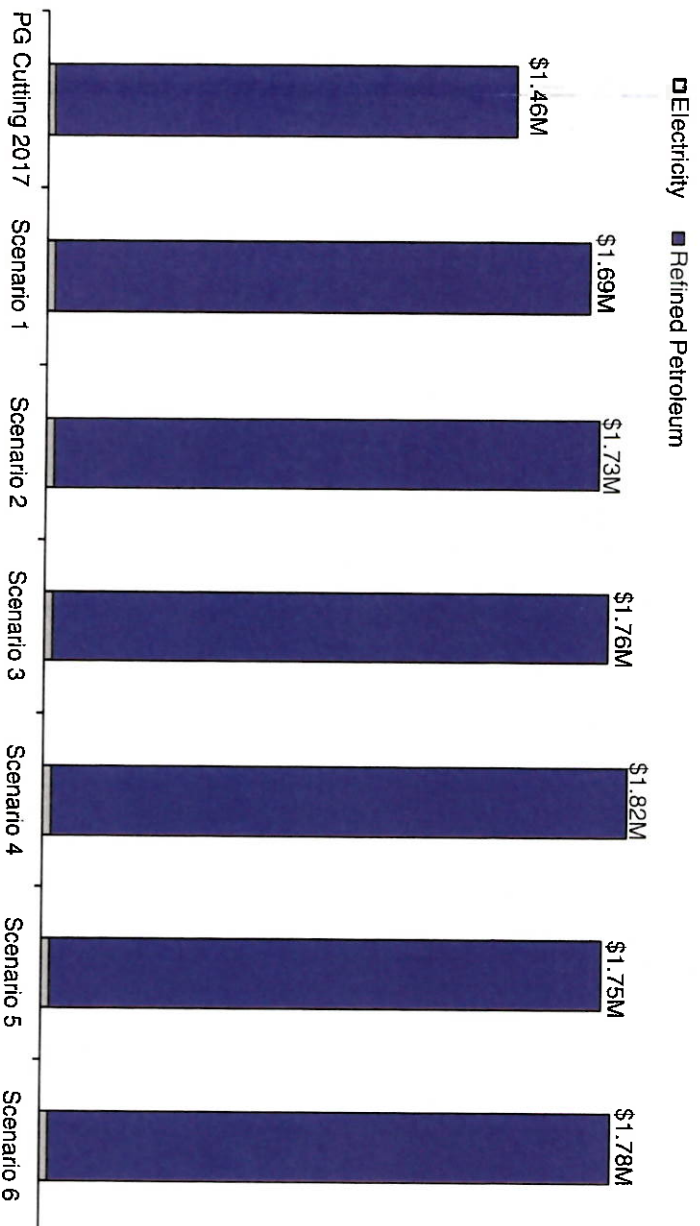
## Key Observations

- The proposed regulation generates a cost increase of anywhere between \$17,800 at the low end and \$27,700 at the high end per year, for the oncoming 13 year period. These changes amount to an average annual percentage increase in costs of 16% to 25%.

Source: Appendix C and D

Proposed regulations will increase total energy costs from \$1.46M to as much as \$1.82M

### Cumulative Energy Costs (2019 – 2031) (\$2017)

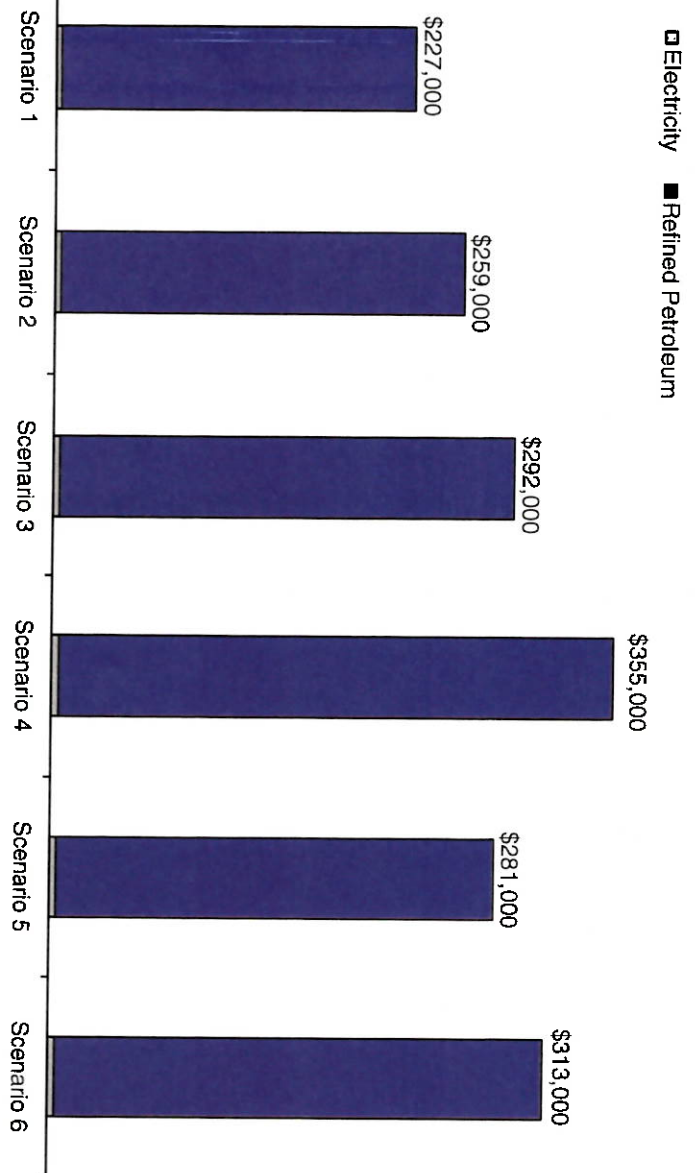


### Key Observations

- Cumulatively, PG Cutting Services is expected to accrue approximately \$1.46 million in energy costs from 2019 to 2031.
- The proposed regulation changes are expected to increase PG Cutting Services' cumulative costs to as much as \$1.82 million.

# Proposed regulations will increase total energy costs by \$230K to \$360K

## Cumulative Energy Costs Increases (2019 – 2031) (\$2017)

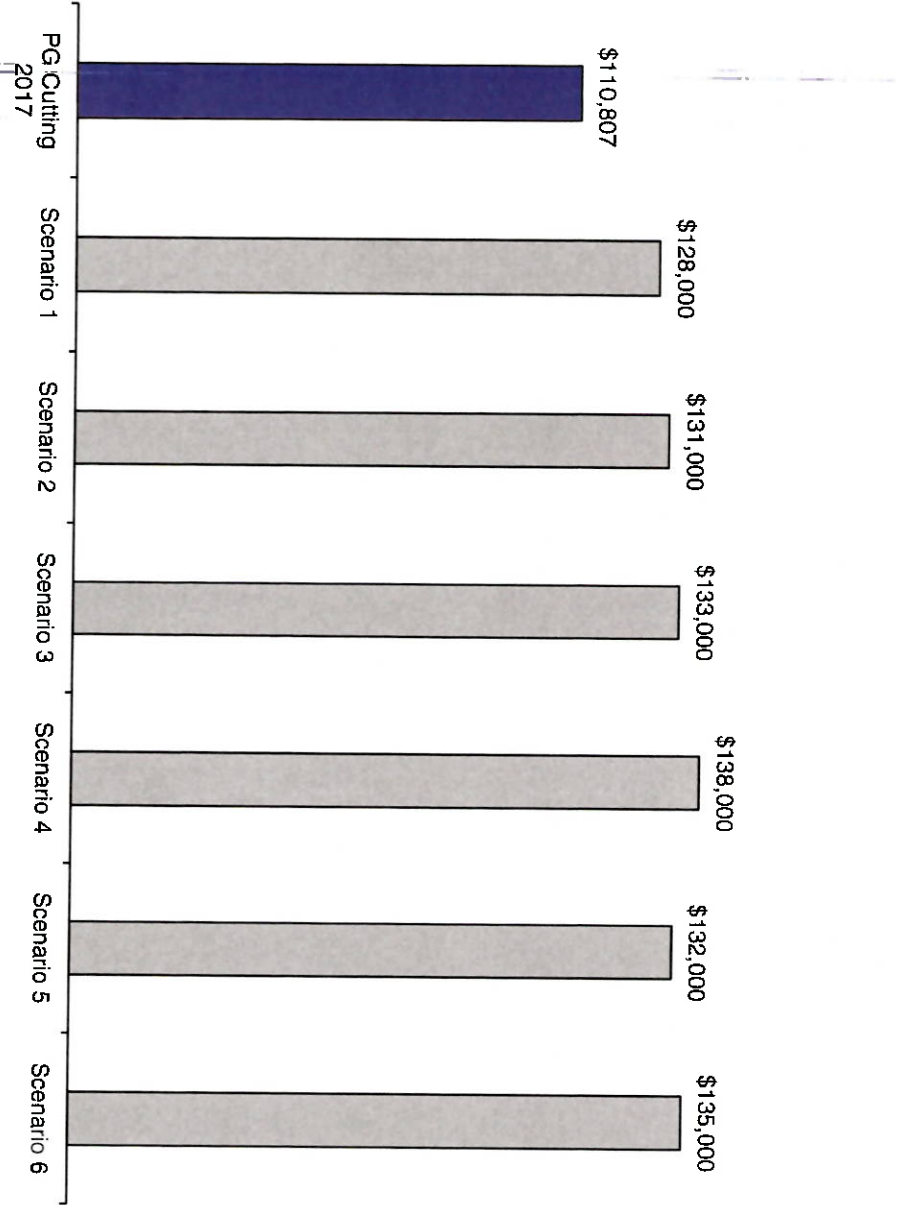


## Key Observations

- The proposed regulations are projected to increase PG Cutting Services' energy costs between \$227,000 and \$355,000 over the oncoming 13 year period, depending on the scenario/regulation changes that take place.
- This amounts to an increase in costs of 16% to 25% over the 13 year period.

# Proposed regulations increase average annual petroleum costs by 16% to 25%

Average Annual Petroleum Costs (2019 – 2031) (\$2017)



## Key Observations

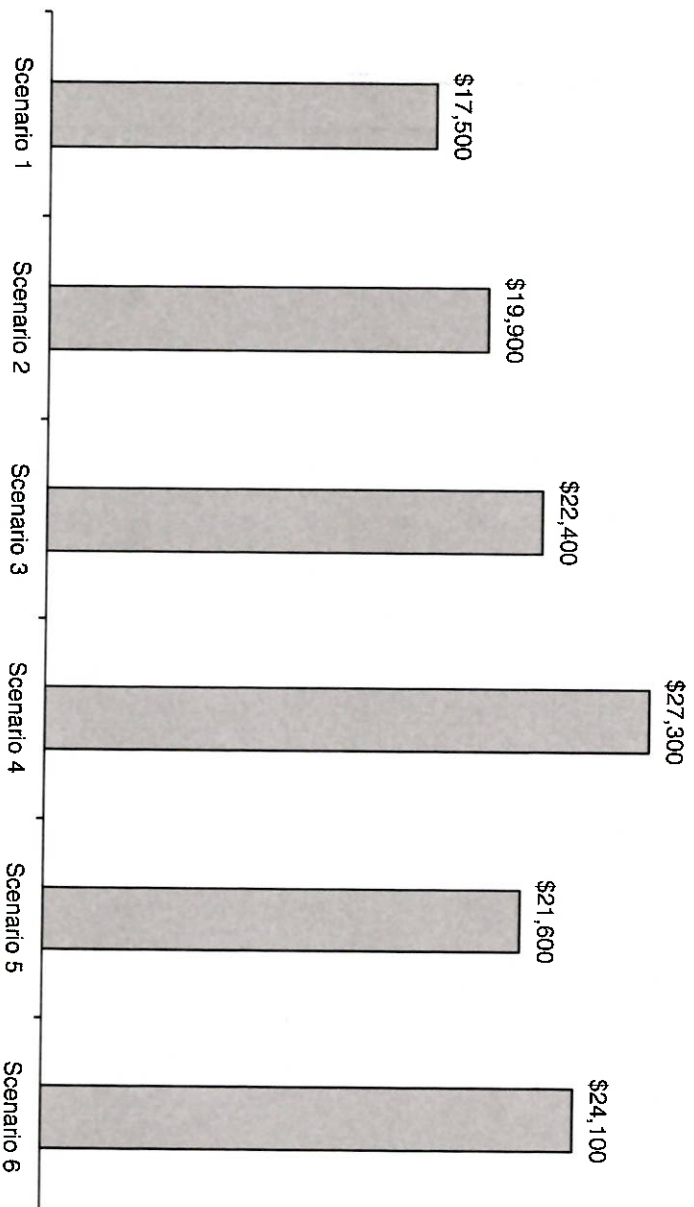
- In 2017, PG Cutting Services used 35,546 gallons of petroleum based products at a cost of \$110,807.
- Under the established NERA cost scenarios, PG Cutting Services would pay between \$128,000 and \$138,000 a year for their petroleum based on 2017 usage.

Source: Appendix C



# Proposed regulations will increase PG Cutting Services' average annual petroleum costs by \$17K to \$27K

Average Annual Petroleum Cost Increases (2019 – 2031) (\$2017)

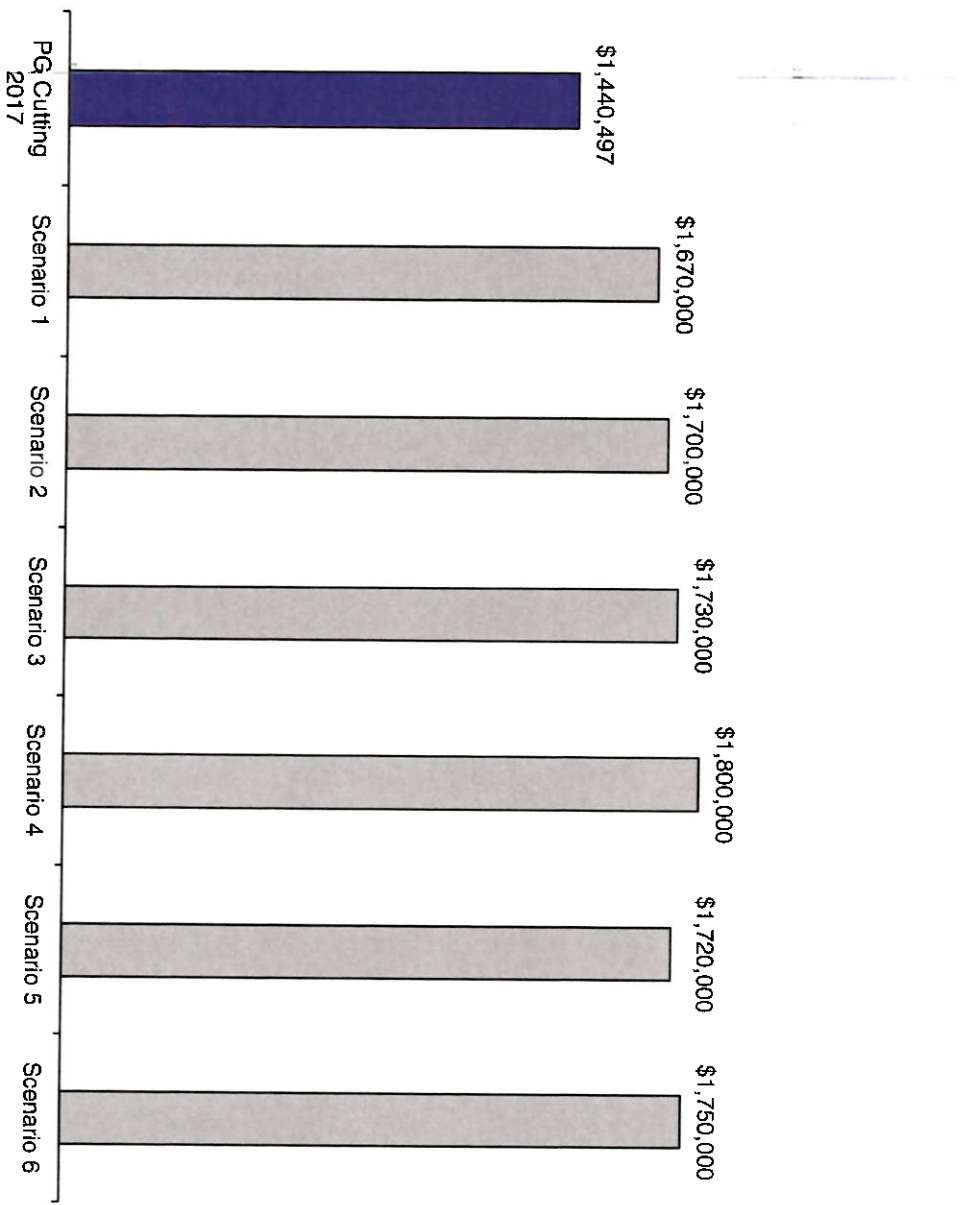


## Key Observations

- The proposed regulation changes amount to an average cost increase of \$17,500 to \$27,300 per year, for the oncoming 13 year period.
- These changes amount to an average annual increase in costs anywhere from 16% to 25%.

# Proposed regulations change total petroleum costs from \$1.4M up to \$1.8M

## Cumulative Petroleum Costs (2019 – 2031) (\$2017)

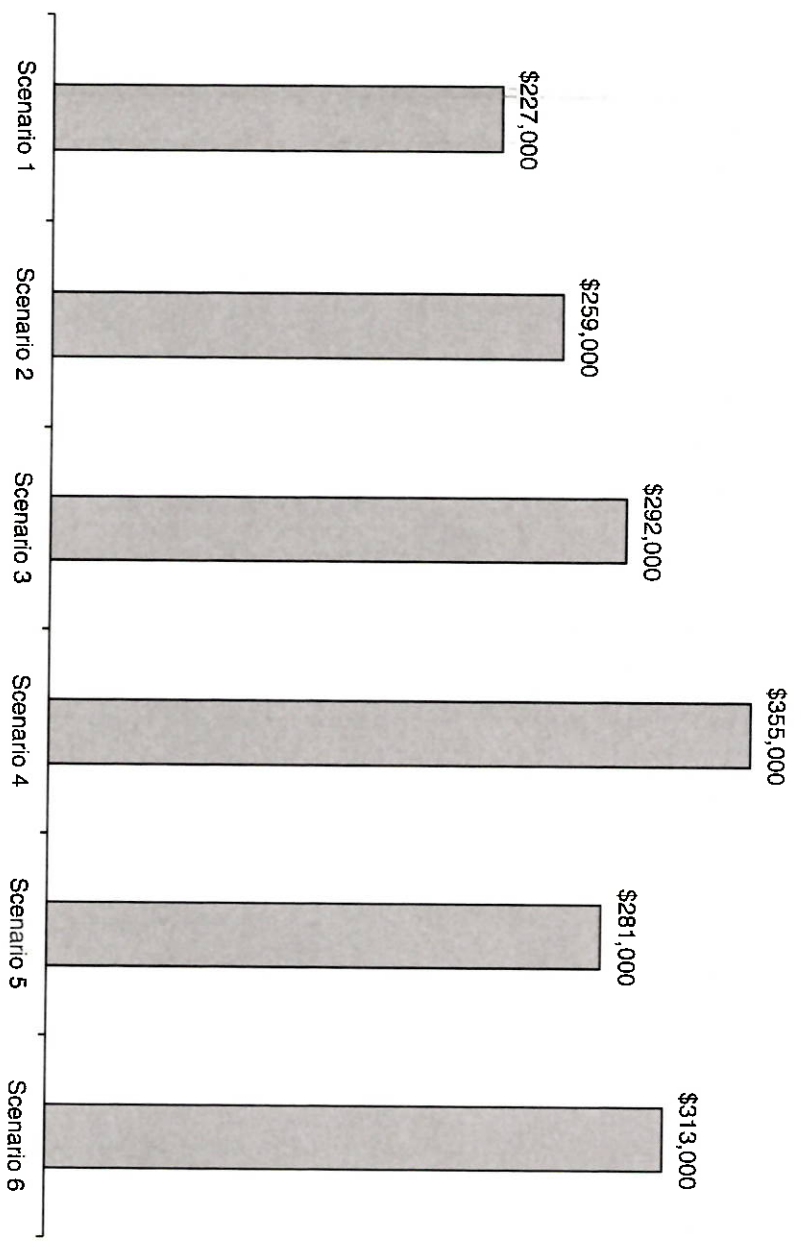


## Key Observations

- PG Cutting Services' cumulative petroleum costs amount to \$1,440,497 based on 2017 prices and usage for the 13 year period of 2019 to 2031.
- PG Cutting Services' costs increase to as much as \$1.80M based on 2017 usage.

# Proposed regulations will increase total petroleum costs by \$2227K to \$355K

## Cumulative Petroleum Cost Increases (2019 – 2031) (\$2017)



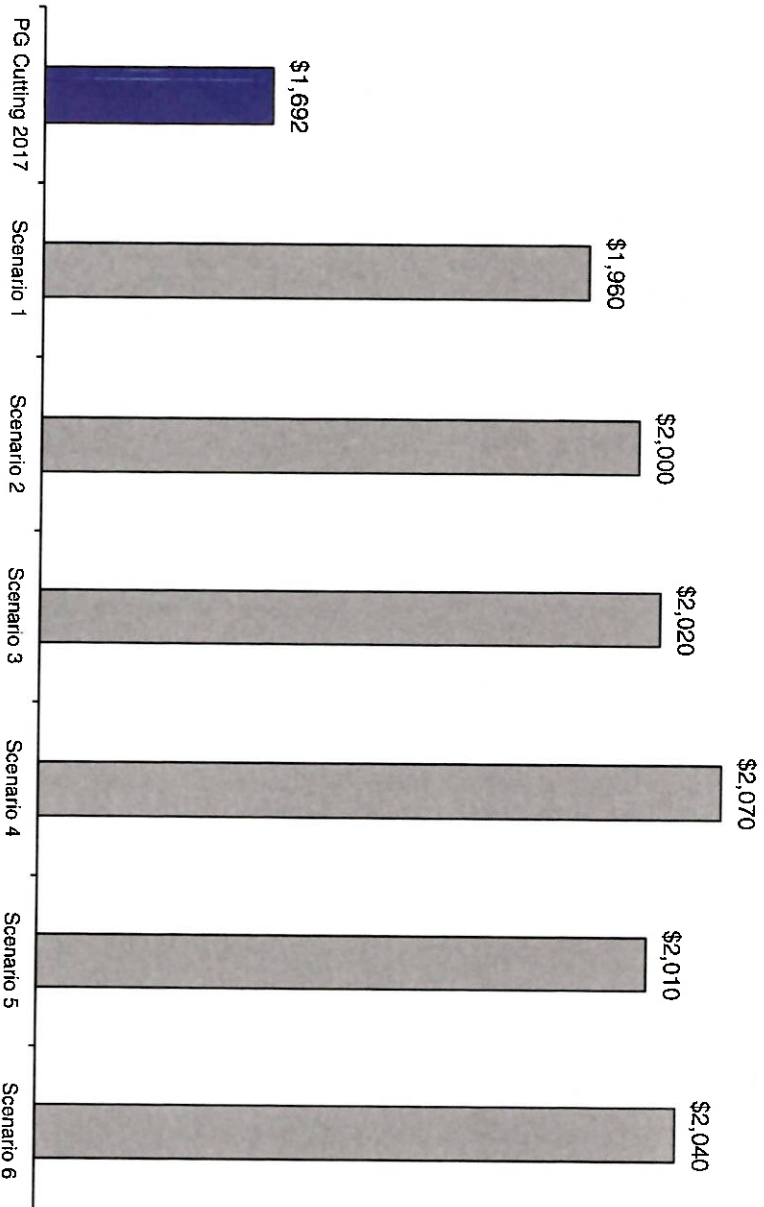
## Key Observations

- PG Cutting Services would experience a net cost increase between \$227,000 and \$355,000 over the 13 year period; an amount equivalent to the cost of two fully equipped truck purchases.<sup>3</sup>
- This is an increase of anywhere between 16% and 25% over the 13 year period.

NOTE: (3) Based on interviews with PG Cutting Services, each fully equipped cutting trucks range between \$140,000 and \$150,000.

# Proposed regulations increase average annual electricity costs by 16% to 22%

## Average Annual Electricity Costs (2019 – 2031) (\$2017)

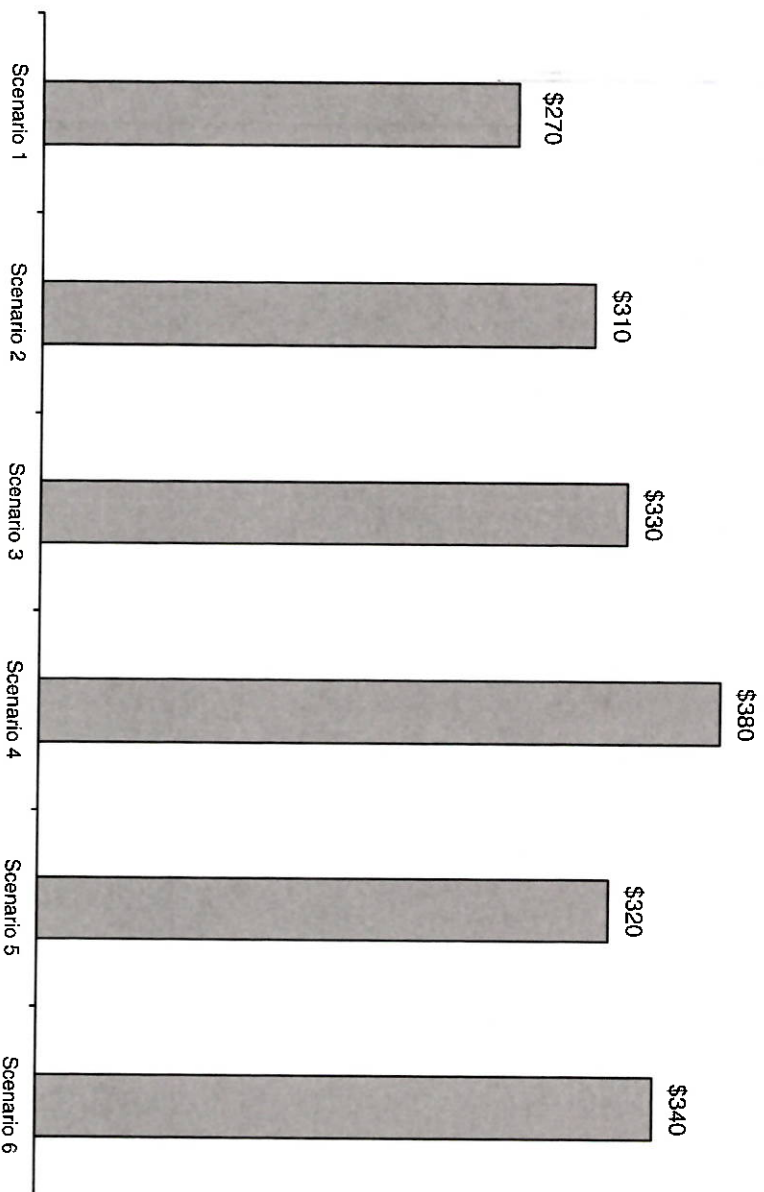


## Key Observations

- In 2017, PG Cutting Services utilized an estimated 15,634 KWh of electricity at a market cost of \$1,692.
- Under the proposed regulations, PG Cutting Services would be expected to increase electricity costs to as much as \$2,070 based on 2017 usage.
- Please note that electricity estimates are conservative and do not reflect PG Cutting Services' expected planned growth.

# Proposed regulations will increase PG Cutting Services' average annual electricity costs by \$270 to \$380

Average Annual Electricity Cost Increases (2019 – 2031) (\$2017)

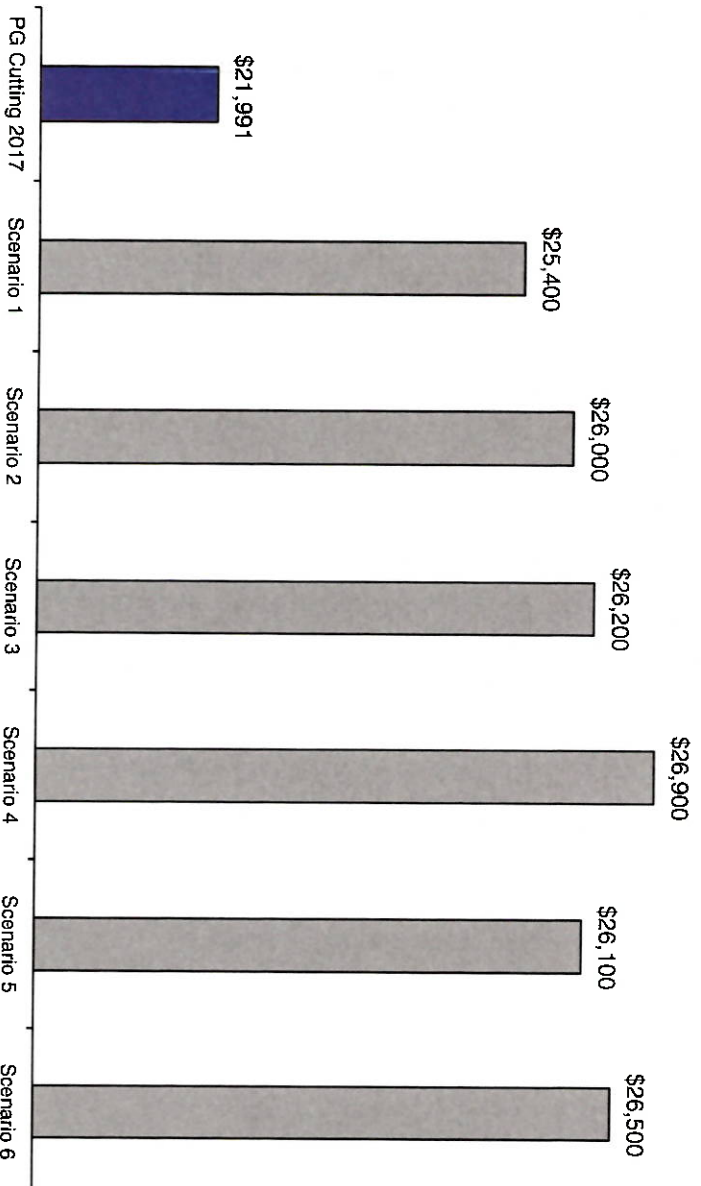


## Key Observations

- The proposed regulation changes amount to an average annual cost increase ranging between \$270 and \$380.
- These changes amount to an average annual increase in costs of anywhere from 16% to 22%.

# Proposed regulations will increase total electricity costs for 2019 to 2031 from \$22K up to \$27K

## Cumulative Electricity Costs (2019 – 2031) (\$2017)

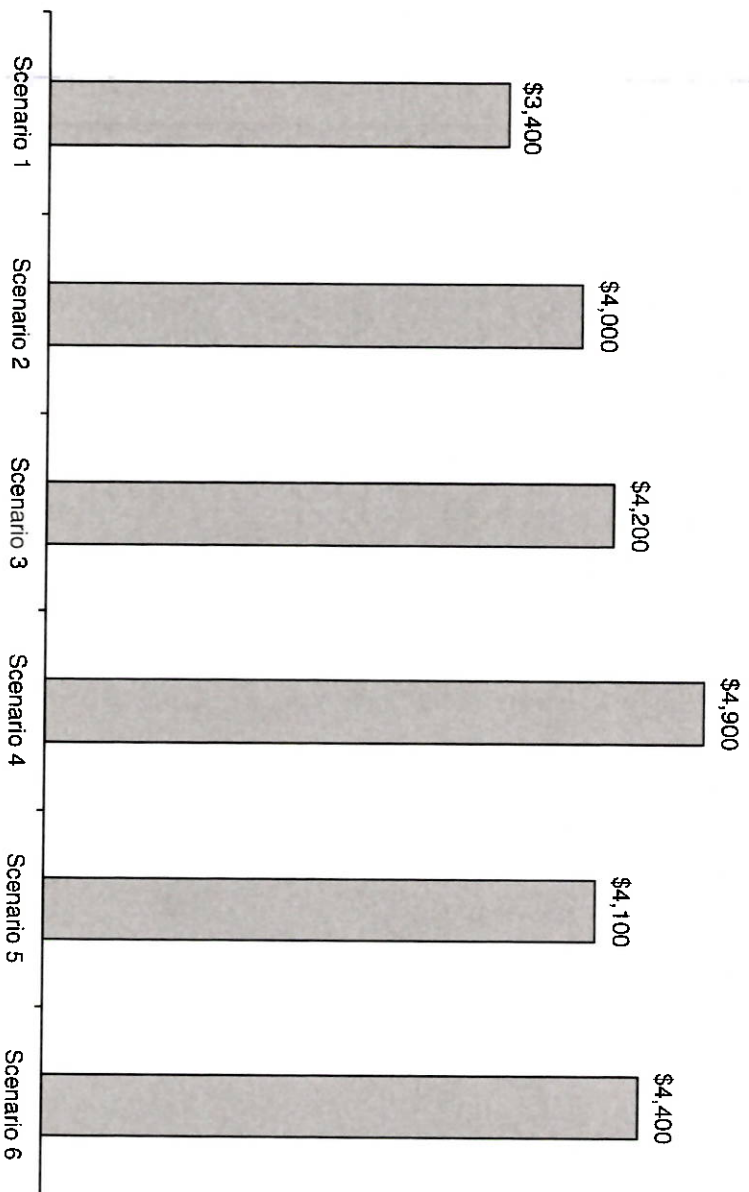


## Key Observations

- Based on 2017 usage and electricity prices, PG Cutting Services is expected to cumulatively expend almost \$22,000 between 2019 to 2031.
- Based on the proposed regulation changes and NERA's scenario analysis, PG Cutting Services is projected to spend between \$25,400 and \$26,900 in electricity costs over the 13 year period.

Proposed regulations will increase total electricity costs from 2019 to 2031 by \$3,400 to \$4,900

### Cumulative Electricity Cost Increases (2019 – 2031) (\$2017)



### Key Observations

- Based on the NERA analysis, electricity costs are expected to increase by as much as \$4,900 over the oncoming 13-year period.
- This is again an increase of anywhere between 16% and 22% over the 13 year period.

## Conclusion

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- Under the provisions established in AB 398, six scenarios were analyzed to determine the economic impacts of different ranges of values of the price ceiling and intermediary containment prices (speed bump prices) at which allowances would be available for sale.
- This analysis is used to determine the cost increases and impact that the provisions may have on the small construction business of PG Cutting Services. The assumptions tend to understate the cost impacts as PG Cutting Services and the construction industry are both growing at a fast rate.
- Costs incurred in 2017 were used as a baseline. In 2017, PG Cutting Services paid a total of \$112,499 for their usage of petroleum based products (35,546 gallons) and electricity (15,634 kWh).
- With the proposed regulations taking effect, from 2019 to 2031, PG Cutting Services' costs are expected to increase up to \$140,000 per year, amounting to an average annual increase of \$27,700 or 25%.
- With the proposed regulation changes taking effect, PG Cutting Services' costs are projected to reach as high as \$1.82 million, amounting to a cumulative cost increase of \$355,000 over the 13 year term.



Appendix A: N<sub>EW</sub> ERA Model

Appendix B: NEERA Economic Scenarios

Appendix C: Annual Petroleum Costs for Scenarios 1-6

Appendix D: Annual Electricity Costs for Scenarios 1-6

Appendix E: Methodological Notes

## Appendix A: N<sub>ew</sub>ERA Model<sup>4</sup>

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- NERA developed the N<sub>ew</sub>ERA model to forecast the impact of policy, regulatory, and economic factors on the energy sectors and the economy.
- When evaluating policies that have significant impacts on the entire economy, this model specification captures the effects as they ripple through all sectors of the economy and associated feedback effects.
- The N<sub>ew</sub>ERA model combines a macroeconomic model with all sectors of the economy with a detailed electric sector model that represents electricity production.
- This combination allows for a complete understanding of the economic impacts of different policies on all sectors of the economy.
- The macroeconomic model incorporates all production sectors except electricity and final demand of the economy. Policy consequences are transmitted throughout the economy as sectors respond until the economy reaches equilibrium.
- NERA's N<sub>ew</sub>ERA modeling system is an integrated energy and economic model that includes a bottom-up representation of the electricity sector, including all of the unit-level details that are required to accurately evaluate changes in the electric sector.
- N<sub>ew</sub>ERA integrates the electricity sector model with a macroeconomic model that includes all other sectors of the economy (except for the electricity production) using a top-down representation.
- The model produces integrated forecasts for future years.
- The integrated modeling approach also provides consistent price responses since all sectors of the economy are modeled.

<sup>4</sup>Source: NERA Economic Consulting, "Study: Economic Impacts of a Proposed 65 ppb National Ambient Air Quality Standard for Ozone on the State of Texas, Appendix A. The NEWERA MODEL," ([http://www.nera.com/content/dam/nera/publications/2015/NERA\\_Ozone\\_Econ\\_Impacts\\_for\\_TCEQ\\_0815.pdf](http://www.nera.com/content/dam/nera/publications/2015/NERA_Ozone_Econ_Impacts_for_TCEQ_0815.pdf))

## Appendix B: NERA Economic Scenarios<sup>5</sup>

Scenarios 1 – 4			
Scenario	Price Ceiling (2021\$/MT CO2)	Speed Bump Price 1	Speed Bump Price 2
Scenario 1	\$39	\$25	\$32
Scenario 2	\$67	\$35	\$51
Scenario 3	\$92	\$43	\$68
Scenario 4	\$166	\$69	\$116

- For scenarios 1 to 4, the speed bump prices were set at 1/3 and 2/3 of the difference between the floor and ceiling prices, with 1/3 of the containment reserve allowances accrued through 2020 made available at each of these prices. Remaining Allowance Price Containment Reserves (APCR) are assumed available for purchase at the ceiling price.
- The scenarios employ an economy wide cap and trade program, and allow for fixed percentages of offsets that vary by year. They employ a 50% renewable portfolio standard (RPS) target, doubling of energy efficiency in commercial buildings by 2030, low carbon fuel standard (LCFC), and a zero-emission vehicle (ZEV) requirement.

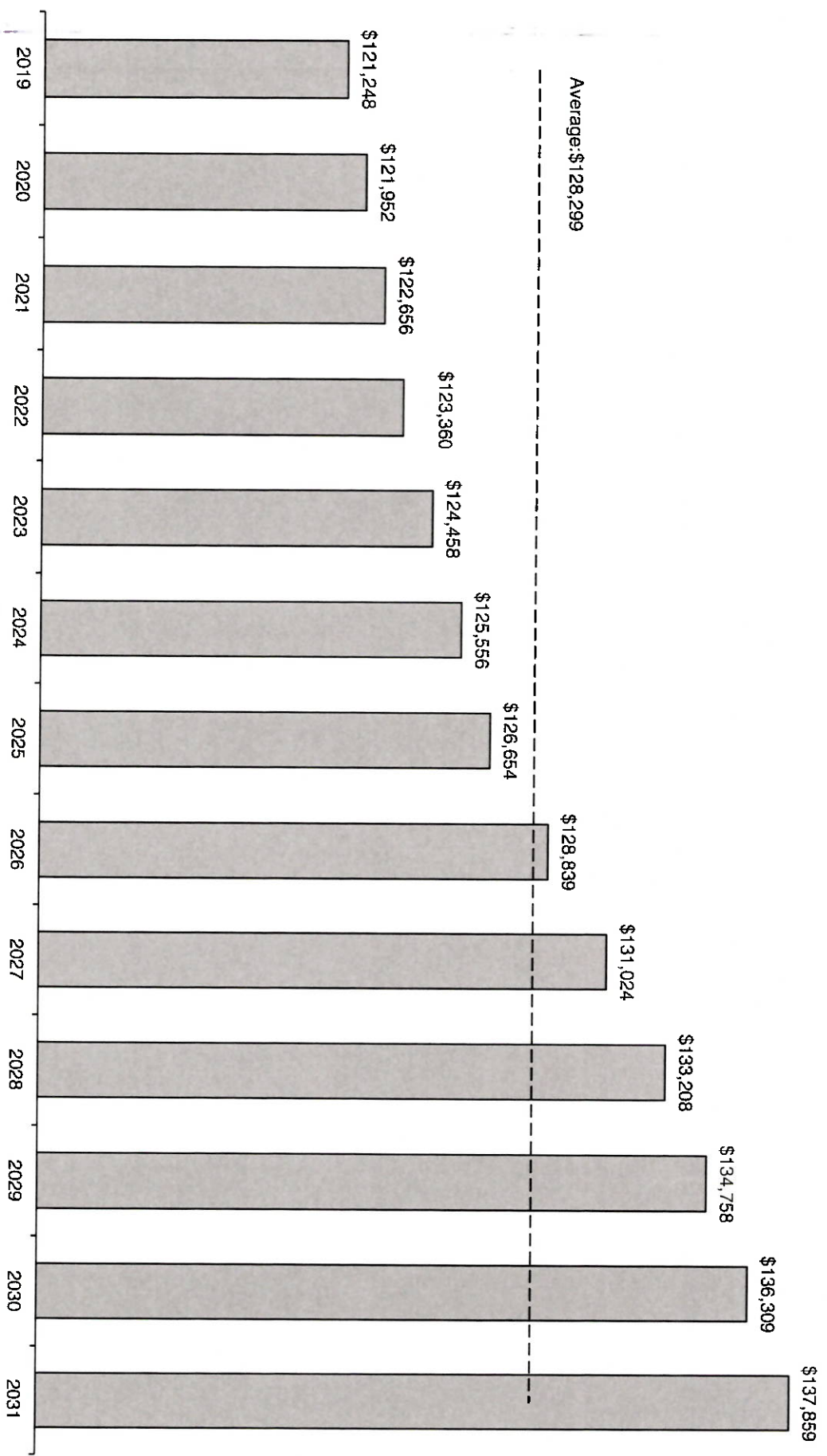
Scenarios 5 – 6					
Scenario	Price Ceiling (2021\$/MT CO2)	Price Ceiling (2021)	Price Ceiling (2030)	Speed Bump 1 and 2 (2021)	Speed Bump 1 and 2 (2030)
Scenario 5	\$65 rising at 5%	\$65	\$101	\$41, \$53	\$64, \$83
Scenario 6	\$65 rising at 1%	\$35	\$71	\$41, \$53	\$45, \$58

- Scenario 5 and 6 take into account the proposed amendment to the California cap on GHG emissions and market-based compliance mechanisms regulation released in September 2018.
- The fifth scenario reflects proposed ceiling, speed bump prices, and distribution of pre-2021 reserve allowances in 2021. The proposed floor price and ceiling prices start at \$17.8 and \$65, respectively, in 2021 and both rise at 5% in real terms. The speed bump prices were set at ½ and ¾ of the difference between the floor and ceiling prices, with 1/3 of the APCR allowances accrued through 2020 being made available at each of these prices. The remaining APCR allowances are assumed available or purchase the ceiling price. The ceiling price tier also includes 39 million previously unsold allowances.
- The sixth scenario assumes a 1% real rise in floor and ceiling prices, while all other assumptions remain the same as the fifth scenario.

<sup>5</sup>Source: NERA Economic Consulting, “Study: AB 398 – Allowance Ceiling Prices and Speed Bumps”

# Appendix C: Annual Petroleum Costs for Scenario 1 (Page 1 of 6)

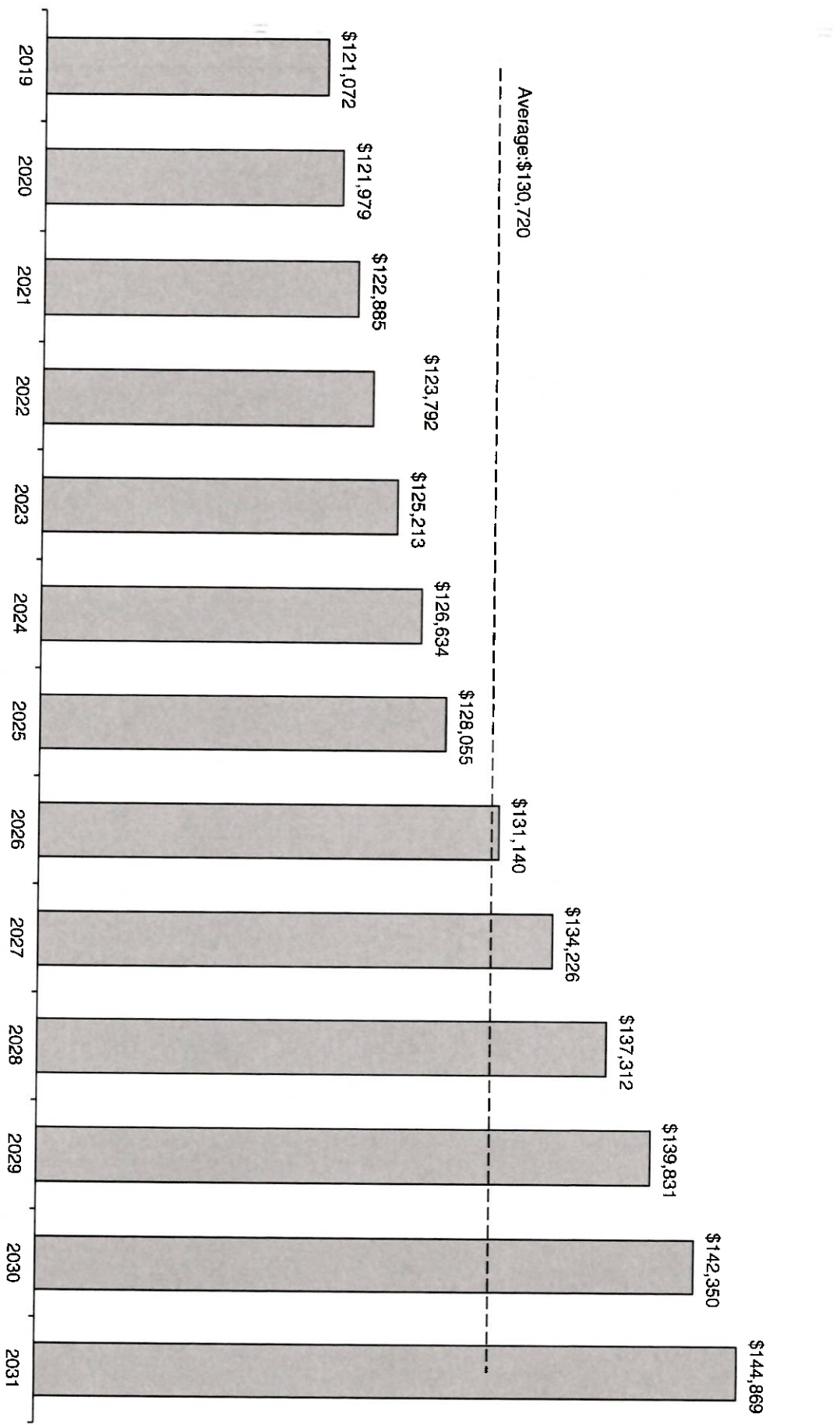
Annual Petroleum Costs (2019 - 2031): Scenario 1 (\$2017)



Source: Appendix E: Methodological Notes - Petroleum

# Appendix C: Annual Petroleum Costs for Scenario 2 (Page 2 of 6)

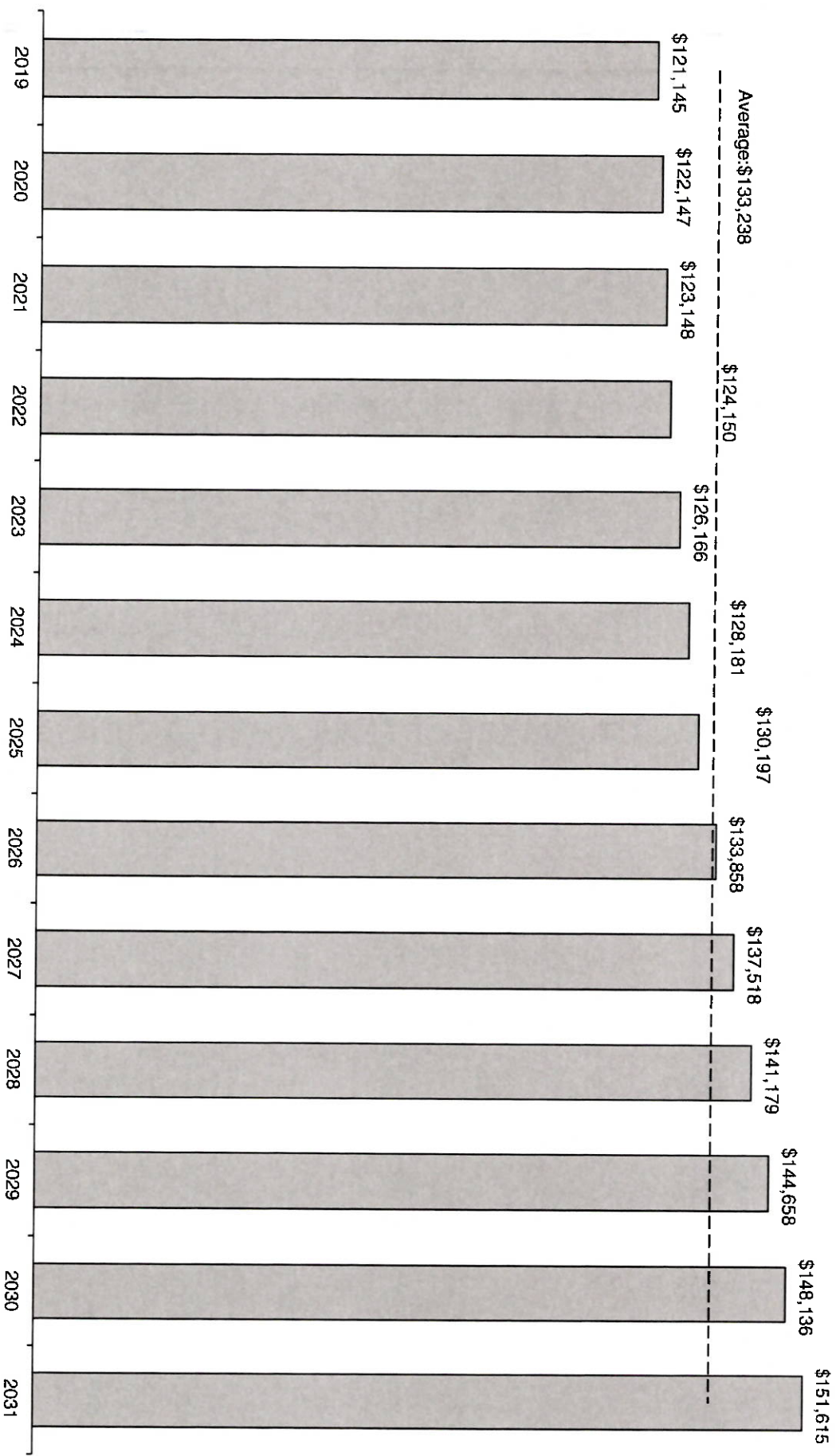
Annual Petroleum Costs (2019 - 2031): Scenario 2 (\$2017)



Source: Appendix E: Methodological Notes - Petroleum

# Appendix C: Annual Petroleum Costs for Scenario 3 (Page 3 of 6)

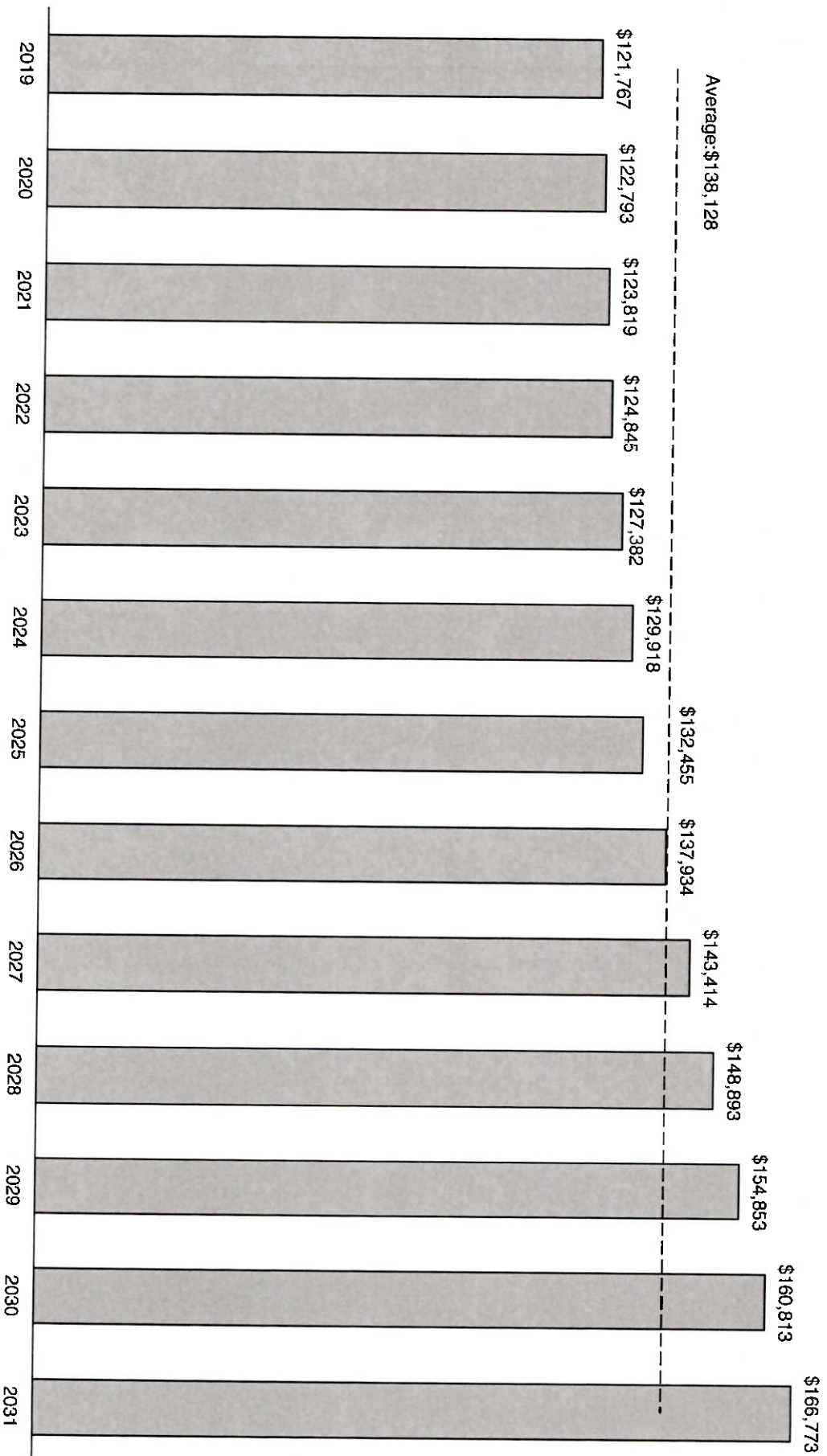
Annual Petroleum Costs (2019 - 2031): Scenario 3 (\$2017)



Source: Appendix E: Methodological Notes - Petroleum

# Appendix C: Annual Petroleum Costs for Scenario 4 (Page 4 of 6)

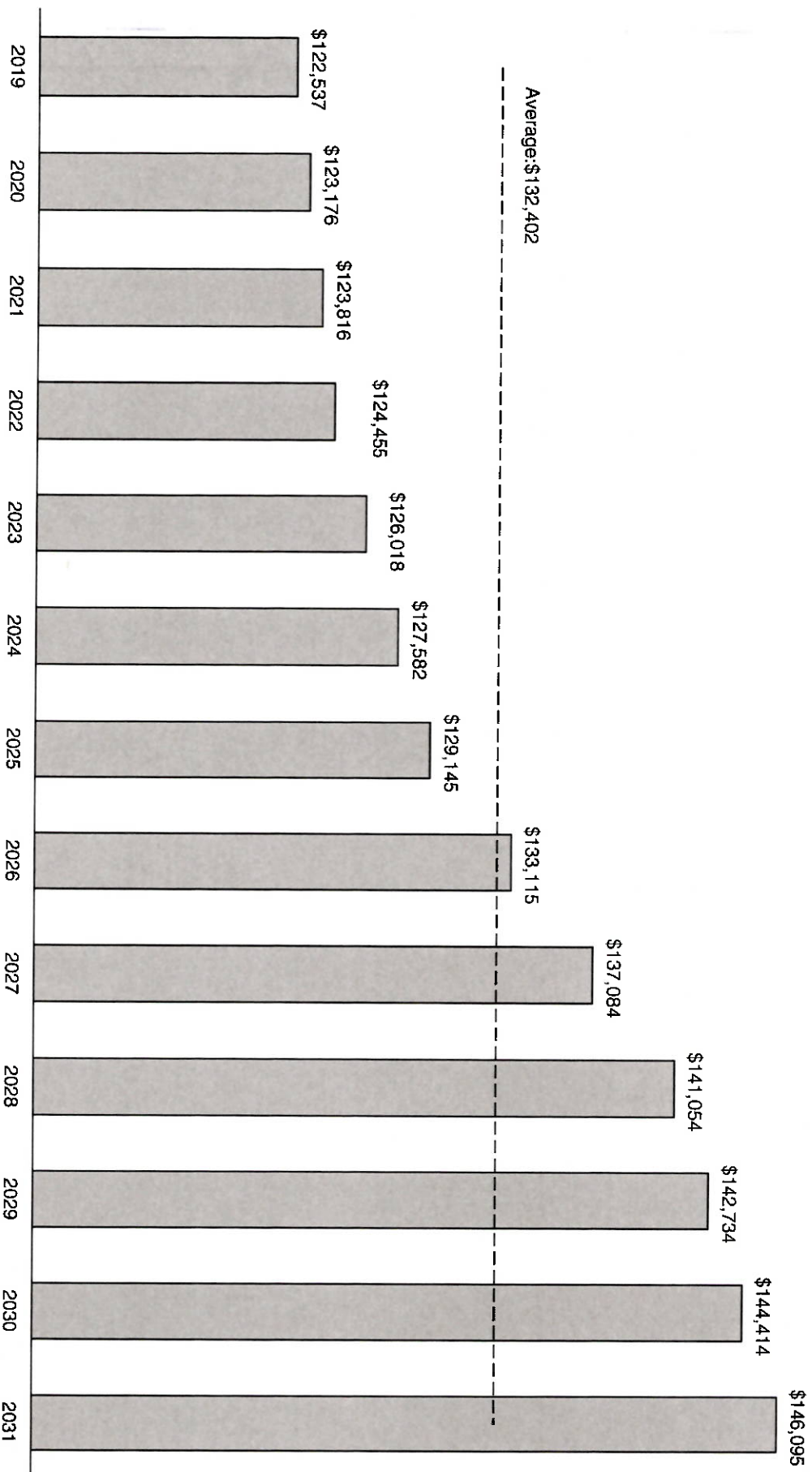
Annual Petroleum Costs (2019 - 2031): Scenario 4 (\$2017)



Source: Appendix E: Methodological Notes - Petroleum

# Appendix C: Annual Petroleum Costs for Scenario 5 (Page 5 of 6)

Annual Petroleum Costs (2019 - 2031): Scenario 5 (\$2017)

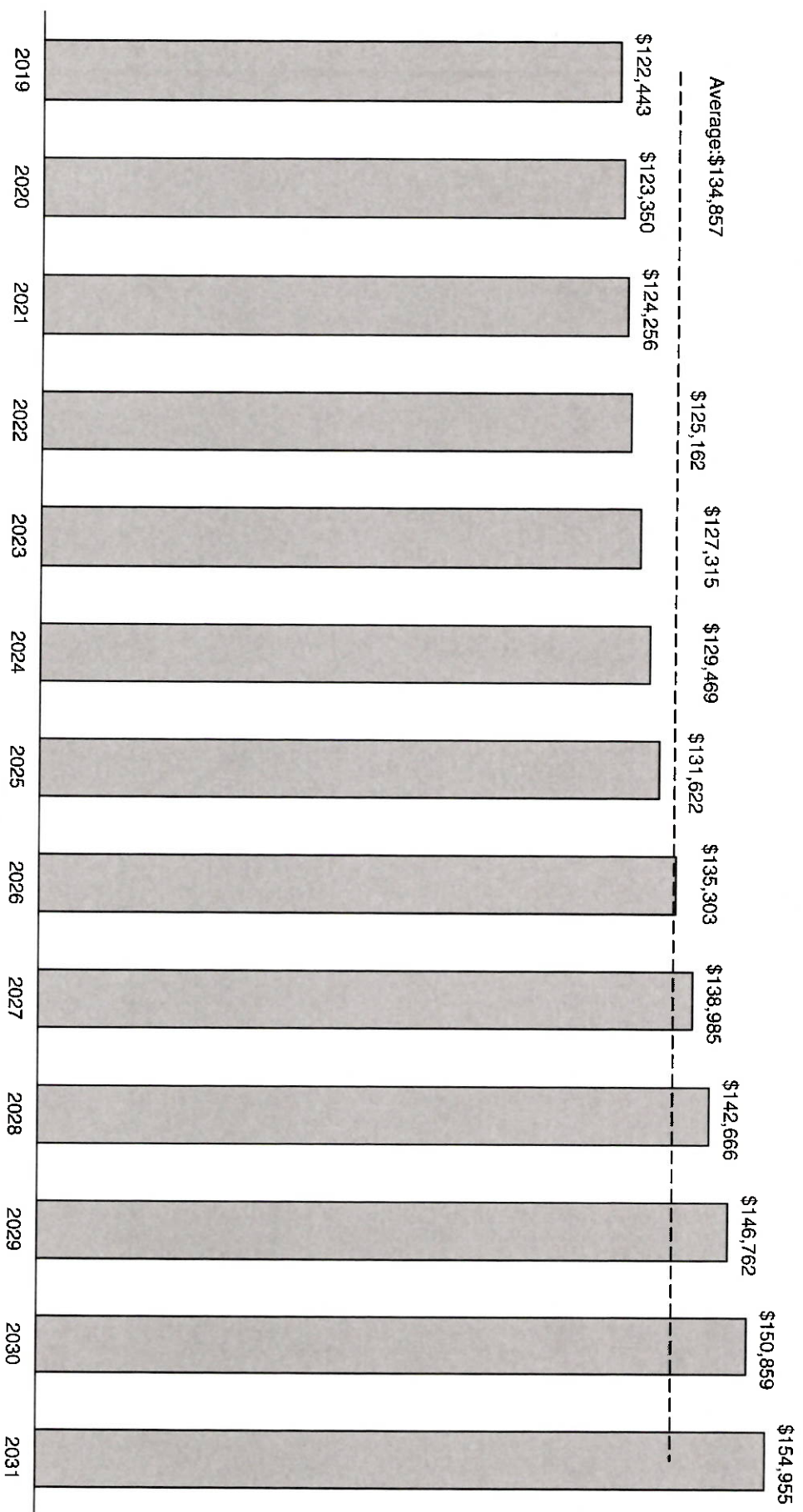


Source: Appendix E: Methodological Notes - Petroleum



# Appendix C: Annual Petroleum Costs for Scenario 6 (Page 6 of 6)

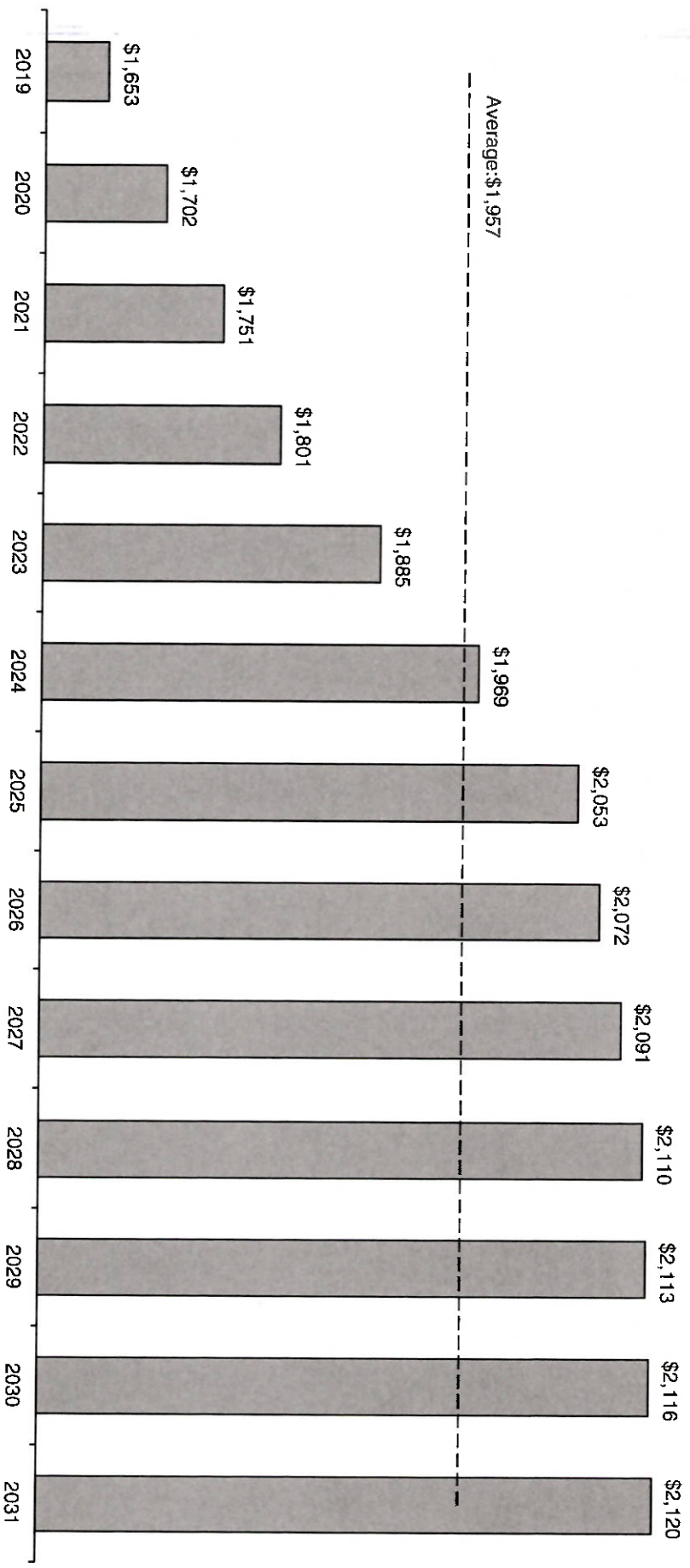
Annual Petroleum Costs (2019 - 2031): Scenario 6 (\$2017)



Source: Appendix E: Methodological Notes - Petroleum

# Appendix D: Annual Electricity Costs for Scenario 1 (Page 1 of 6)

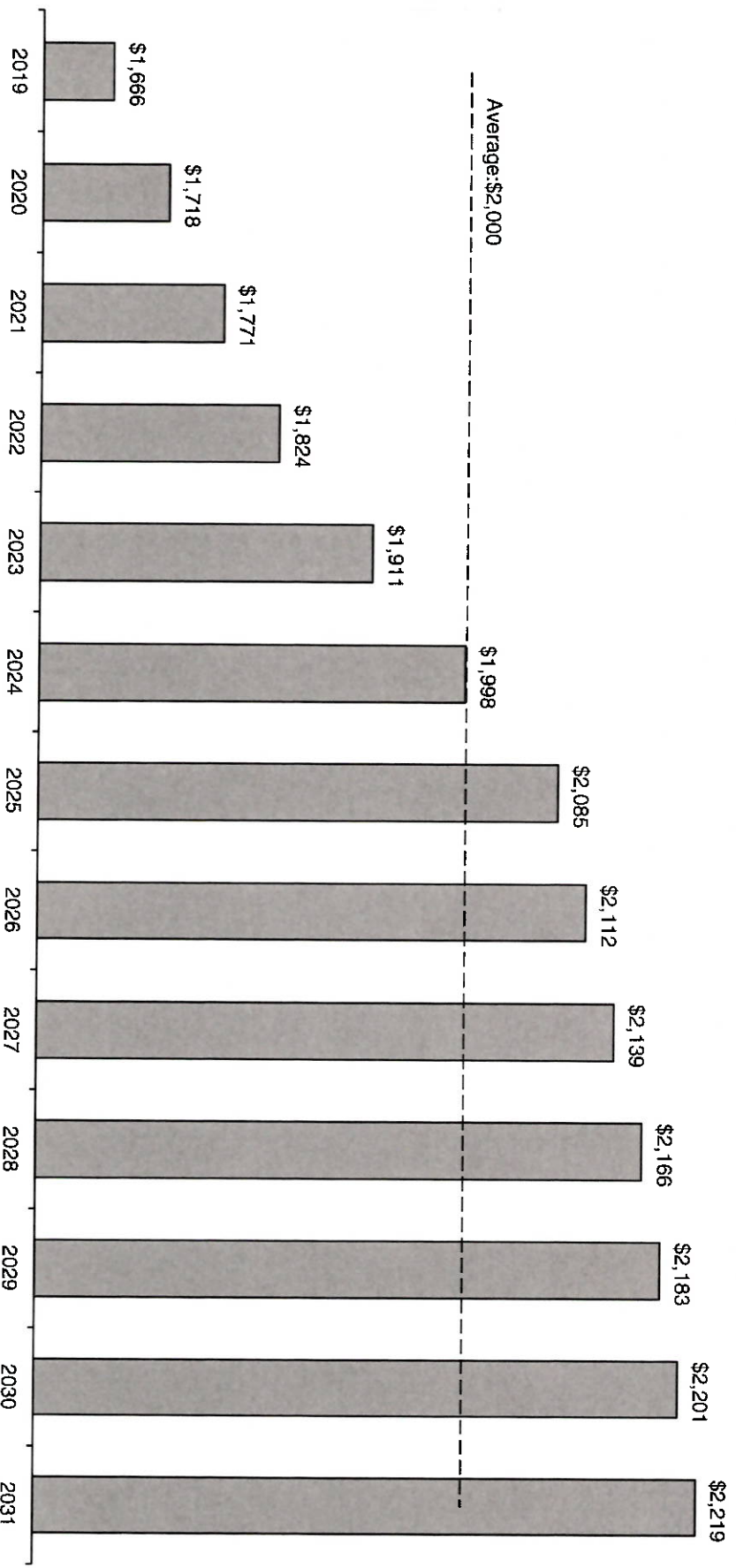
Annual Electricity Costs (2019 - 2031): Scenario 1 (\$2017)



Source: Appendix E: Methodological Notes - Electricity

# Appendix D: Annual Electricity Costs for Scenario 2 (Page 2 of 6)

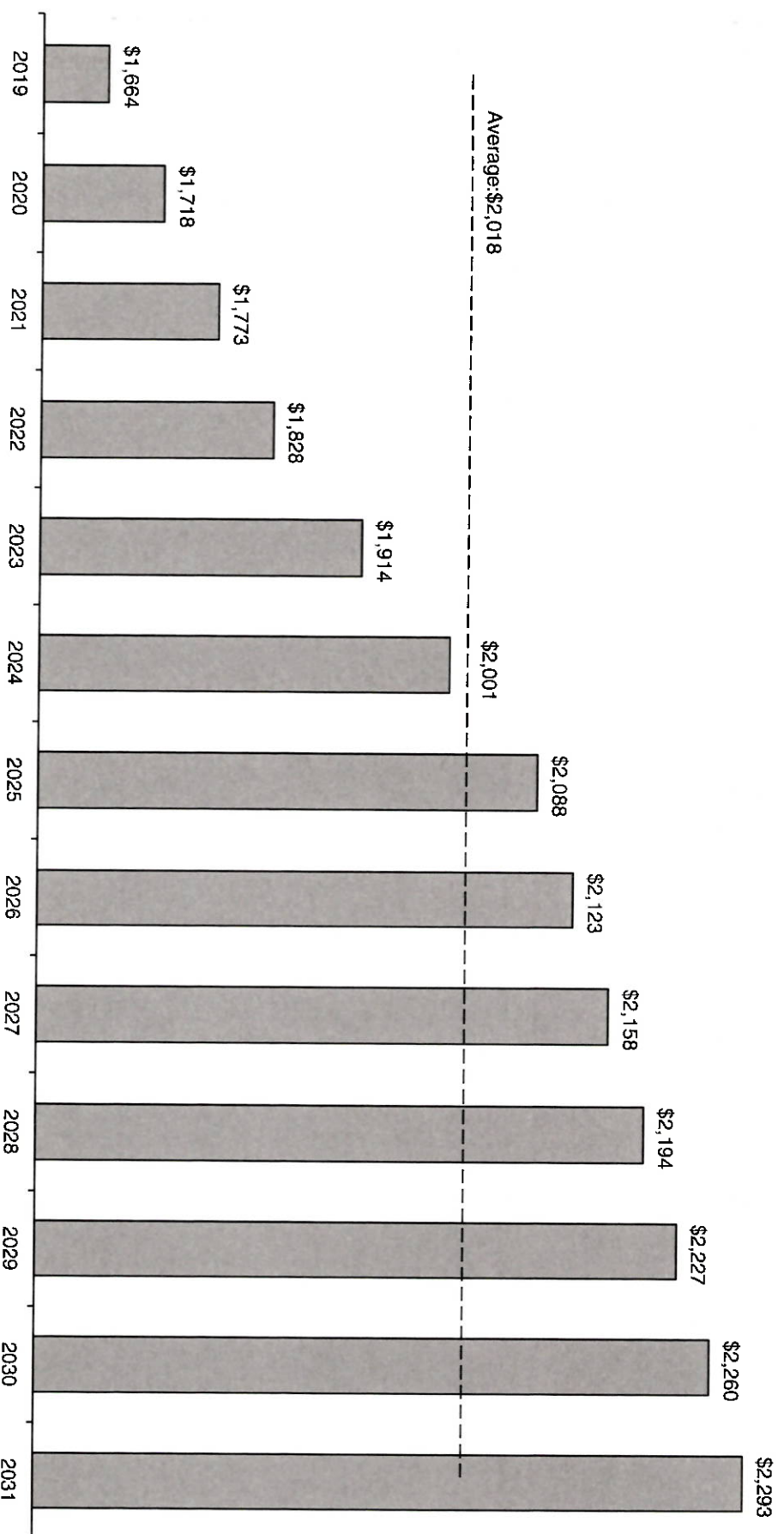
Annual Electricity Costs (2019 - 2031): Scenario 2 (\$2017)



Source: Appendix E: Methodological Notes - Electricity

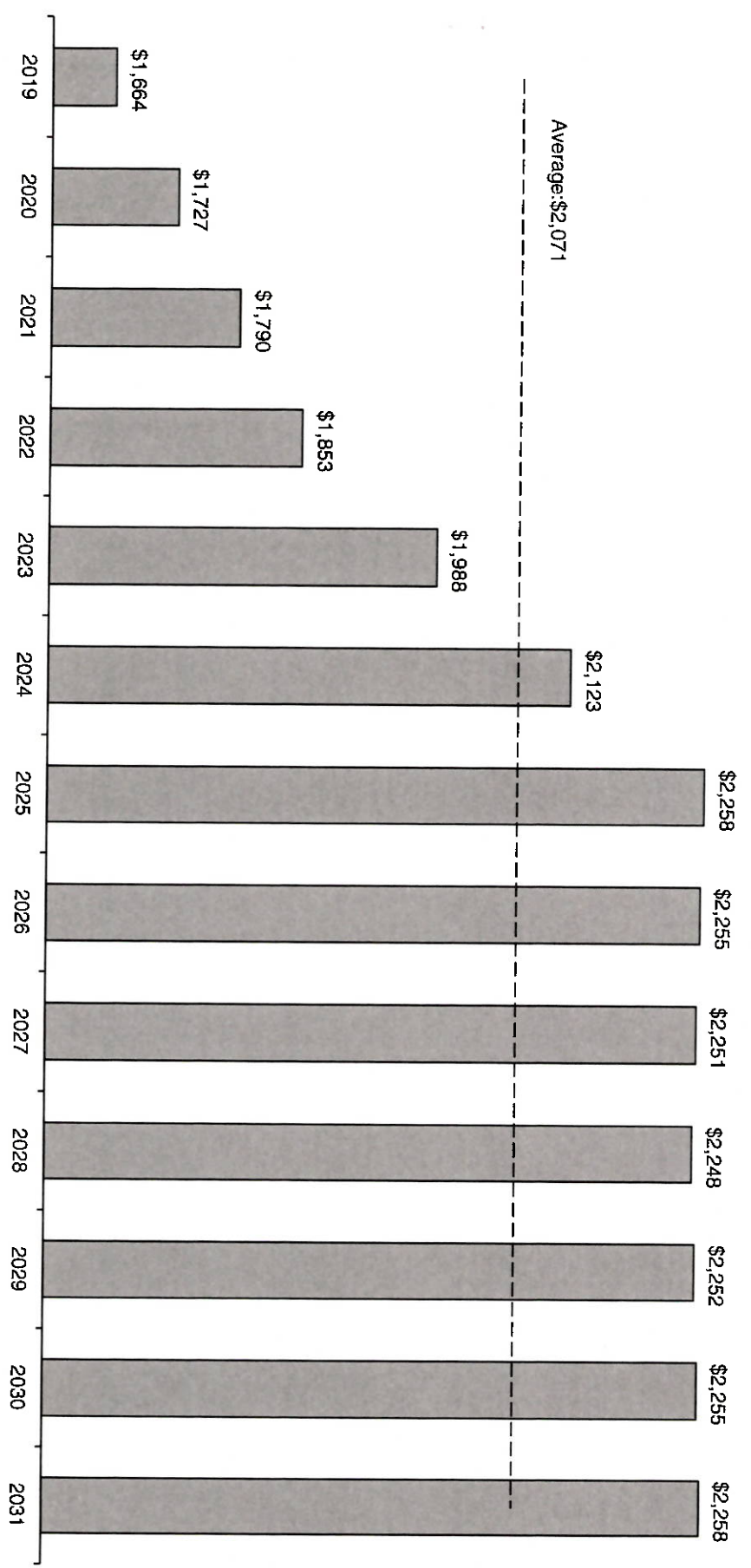
# Appendix D: Annual Electricity Costs for Scenario 3 (Page 3 of 6)

Annual Electricity Costs (2019 - 2031): Scenario 3 (\$2017)



# Appendix D: Annual Electricity Costs for Scenario 4 (Page 4 of 6)

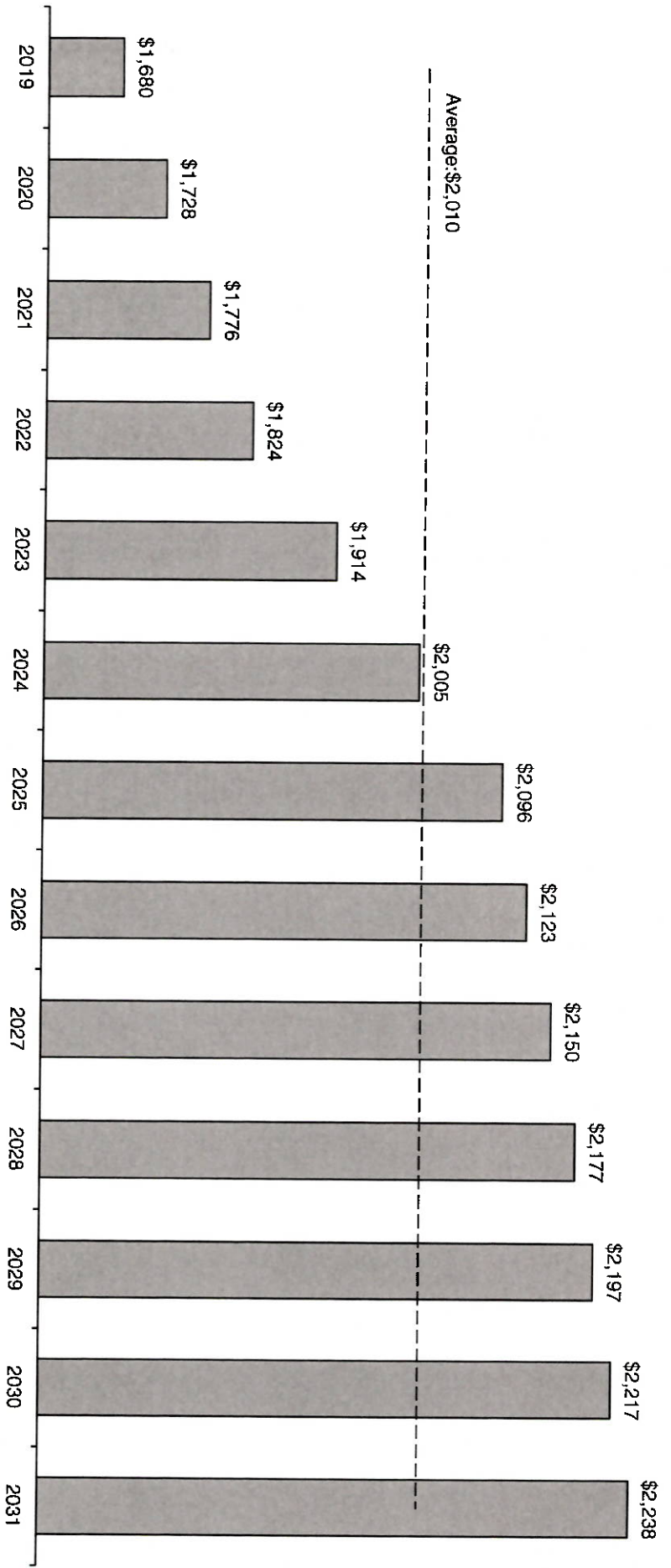
Annual Electricity Costs (2019 - 2031): Scenario 4 (\$2017)



Source: Appendix E: Methodological Notes - Electricity

# Appendix D: Annual Electricity Costs for Scenario 5 (Page 5 of 6)

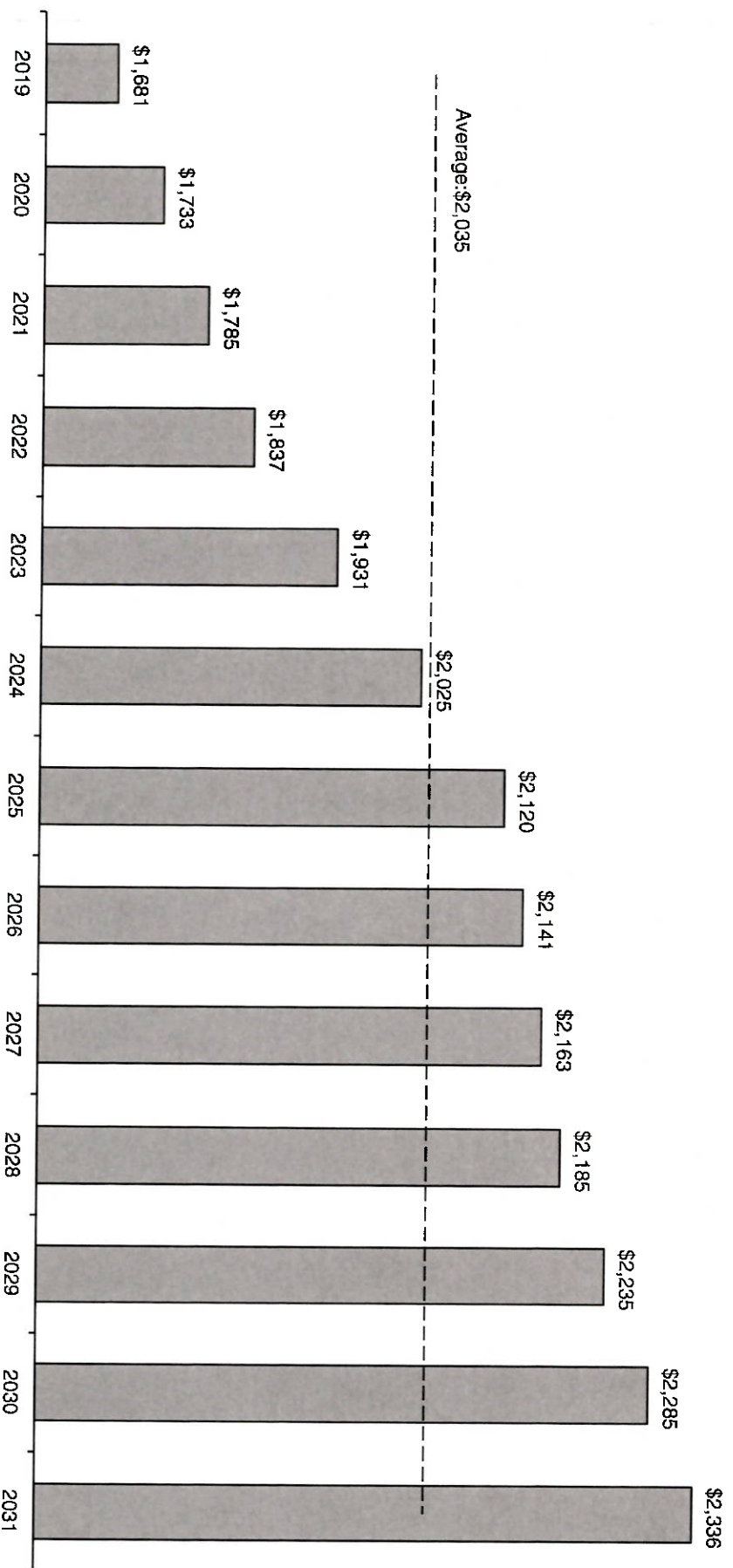
Annual Electricity Costs (2019 - 2031): Scenario 5 (\$2017)



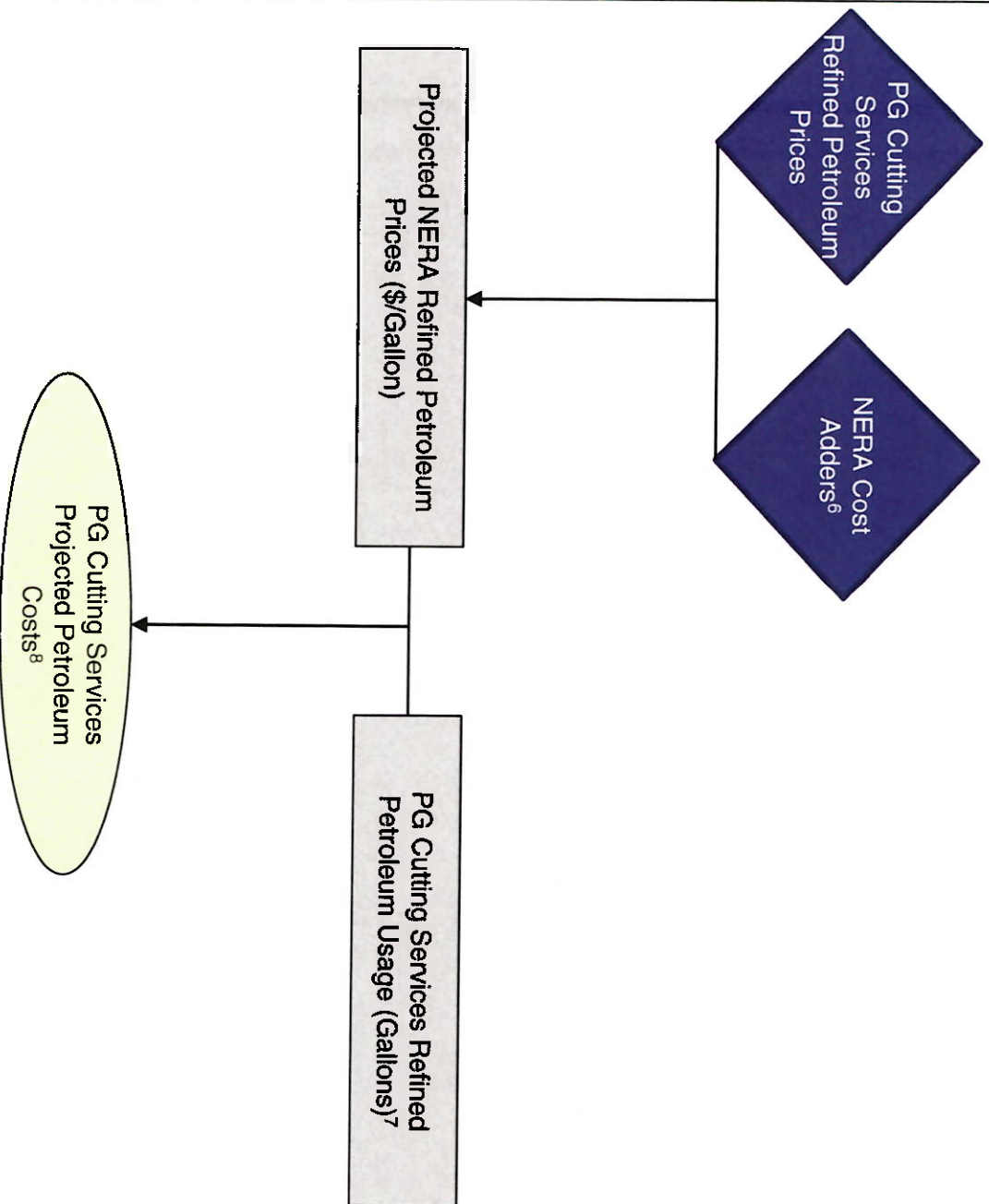
Source: Appendix E: Methodological Notes - Electricity

# Appendix D: Annual Electricity Costs for Scenario 6 (Page 6 of 6)

Annual Electricity Costs (2019 - 2031): Scenario 6 (\$2017)



Refined Petroleum Cost Calculations



Notes

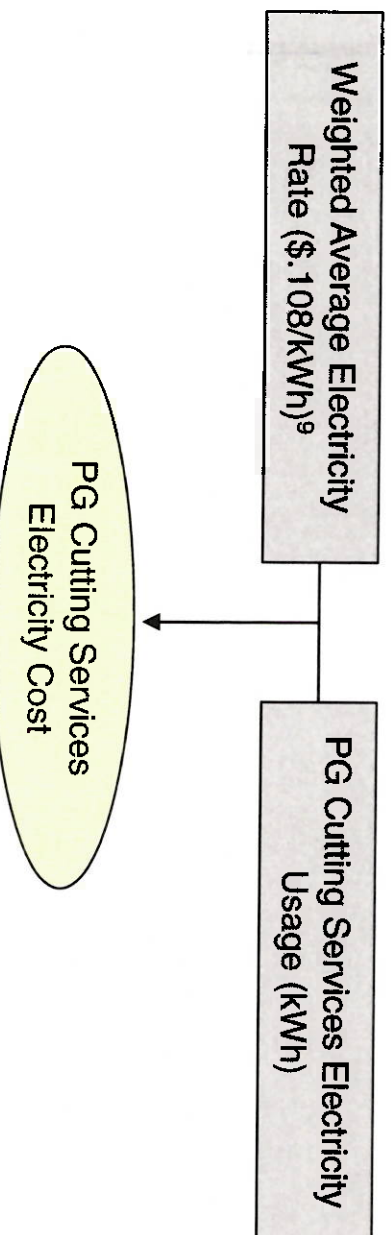
<sup>6</sup> NERA provided Cost Adders for the Carbon + LCFS permit prices. These cost adders of refined petroleum are for Gasoline of the Residential sector, and for Diesel of the Trucking sector, and there are cost adders for each of the 6 scenarios. They are added to the PG Cutting Services Refined Petroleum Prices, to obtain the Projected NERA Refined Petroleum Prices.

<sup>7</sup> These usage numbers were provided by PG Cutting Services, for their Gasoline and Diesel use.

<sup>8</sup> The PG Cutting Services projected petroleum costs are calculated for the six scenarios, for years 2019 to 2031.



### Electricity Cost Calculation



### Notes

<sup>9</sup> To calculate PG Cutting Service' 2017 electricity costs, a price rate for electricity was established by calculating a weighted average electricity rate. This was done by using Southern California Edison's listed Commercial/Industrial Schedule energy demand charge rates (Southern California Edison, <https://www.westernenergyboard.org/web/electric/dt/programs/sce-tou.doc>).