SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft Socioeconomic Impact Assessment For Proposed Amended Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities

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EXECUTIVE SUMMARY

On March 17, 1989, the South Coast Air Quality Management District (South Coast AQMD) Governing Board adopted a resolution which requires an analysis of the economic impacts associated with adopting and amending rules and regulations. In addition, Health and Safety Code Section 40440.8 requires a socioeconomic impact assessment for any proposed rule, rule amendment, or rule repeal which "will significantly affect air quality or emissions limitations." Lastly, Health and Safety Code Section 40920.6 requires an incremental cost-effectiveness analysis for a proposed rule or amendment which imposes Best Available Retrofit Control Technology (BARCT) or "all feasible measures" requirements relating to emissions of ozone, carbon monoxide (CO), sulfur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOC), and their precursors.

Proposed Amended Rule (PAR) 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities, establishes oxides of nitrogen (NOx) mass emission limits to reflect the Best Available Retrofit Control Technology (BARCT), requirements to install zero-emission (ZE) or near zero-emission (NZE) electricity generating equipment, and requirements to remove from service existing prime power diesel-internal-combustion engines for electricity generating units located on Santa Catalina Island. In addition, PAR 1135 establishes provisions for monitoring, reporting and recordkeeping for NZE electricity generating units and units not required to install continuous emissions monitoring systems (CEMS) located on Santa Catalina Island. PAR 1135 also includes updates to remove outdated rule provisions and correct rule references, and other editorial changes. Upon full implementation, PAR 1135 is expected to reduce NOx emissions by 65.3 tons per year (tpy).

A socioeconomic impact assessment has been conducted to assess the socioeconomic impacts from implementing PAR 1135 and the following presents a summary of the analysis and findings.

Key Elements of PAR 1135	PAR 1135 establishes NOx emission limits to reflect the BARCT, requirements to install ZE/NZE equipment, and requirements to remove from service existing prime diesel internal-combustion engines for electricity generating units located on Santa Catalina Island.
Affected Facilities and Industries	The implementation of PAR 1135 will affect only one electricity generating facility located on Santa Catalina Island, which currently operates six diesel internal combustion engines and 23 microturbines to generate power. The facility is classified under the industry of Fossil Fuel Electric Power Generation per North American Industry Classification System (NAICS) with a NAICS code 221112. The affected facility does not qualify as a small business, based on various definitions of small businesses.
Assumptions for the Analysis	PAR 1135 contains a final NOx emission limit (annual cap) of six tpy for the affected facility located on Santa Catalina Island. To achieve the final NOx emission limit, the affected facility may purchase and install solar photovoltaic cells (ZE equipment), propane-fueled linear generators and fuel cells (NZE equipment), and replace three existing diesel internal combustion engines (identified in Table 1 as Diesel Engine Units 8, 10 and

15) and all 23 microturbines with three Tier 4 Final diesel engines.

Because the age of the equipment to be replaced ranges from 29 to 60 years old , the analysis assumed that the three replaced diesel internal combustion engines and 23 microturbines would have no resale value and thus, their replacement would not result in stranded assets.

PAR 1135 would result in the replacement of the existing diesel internal combustion engines and microturbines with Tier 4 Final diesel engines no earlier than the year 2027, but no later than 2035. In addition, in order to achieve the final NOx limit, a combination of ZE technology such as solar technology and NZE equipment such as propane-fueled linear generators and fuel cells would need to be deployed between 2029 and 2035. All equipment is assumed in this analysis to have a useful life of 25 years.

Compliance Costs

The analysis of compliance costs covers the period from 2027 to2059. The implementation of PAR 1135 is projected to result in an overall cost savings attributable to the recurring costs from maintenance and parts, employee and service costs, and fuel costs. The average annual cost savings due to the implementation of PAR 1135 are estimated to range from $14.99 million to $14.16 million from 2027 to 2059, depending on real interest rates assumed (1% to 4%).

The following table presents a summary of the average annual costs or savings of PAR 1135 implementation by cost categories. While the implementation of PAR 1135 will result in annual compliance costs for all capital cost items, a substantial cost savings for most recurring cost items will also be expected overall.

Average Annual Compliance Costs/Savings (2027-2059)

Cost Categories	1% Real Interest Rate	4% Real Interest Rate
One-Time Cost		
Primary Equipment, Ancillary, Shipping and Delivery	$717,882	$982,838
Installation Costs, Direct	$1,125,759	$1,541,254
Installation Costs, Indirect	$425,426	$582,442
Recurring Costs/Savings		
Maintenance and Parts	($1,205,283)	($1,205,283)
Employee and Service Costs	($2,415,588)	($2,415,588)
Fuel Costs (including shipping)	($15,458,955)	($15,458,955)
Land Lease Cost	$1,817,580	$1,817,580
Total	**($14,993,179)**	**($14,155,712)**

Job Impacts

The direct effects of PAR 1135 were used as inputs to the REMI model in order to assess secondary/induced impacts for all the industries in the four-county economy on an annual basis and across a user-defined horizon.

When the compliance cost is annualized using a 4% real interest rate, a close-to-zero job impact is projected for the four-county economy over the period from 2027 to 2059 because the positive job impact and negative job impact cancel each other out over the forecast period.

In 2027, about 51 jobs are expected to be added to the economy due to compliance expenditures and additional spending associated with the installation of ZE and NZE electricity generating equipment. These additional jobs are expected to come from sectors such as Construction (NAICS 23), Professional, Scientific and Technical Services (NAICS 54), and Real Estate (531).

The cost savings in fuel costs and maintenance and parts, which are both part of the recurring operation & maintenance (O&M) costs, is expected to shrink the markets for wholesale diesel and professional contractors, which will lead to jobs foregone in sectors of Wholesale Trade (NAICS 42) and Professional, Scientific and Technical Services (NAICS 54). In 2036, about 95 jobs are expected to be foregone in the four-county economy where 41 and six jobs foregone are projected to occur in the sectors of Wholesale Trade, and Professional, Scientific and Technical Services, respectively, due to the cost savings resulting from implementing PAR 1135.

Competitiveness

The overall impacts of PAR 1135 on production costs and delivered prices in the South Coast AQMD region is not expected to be significant. According to the REMI Model, PAR 1135 is projected to decrease the relative delivered price and the cost of production in the sector of Utilities (NAICS 22) in the region by 0.034% and 0.056% over the period from 2027 to 2059, respectively, which would result in relatively cheaper utility rates for consumers in the region.

Impact of CEQA Alternatives

Four alternatives to the proposed project were developed for the CEQA analysis conducted in the Draft Subsequent Environmental Assessment (SEA): Alternative A – No Project, Alternative B – More Stringent, Alternative C – Less Stringent, and Alternative D – No ZE Equipment. Under Alternative A, the facility on Santa Catalina Island would still be subject to the 2018 amendment to Rule 1135, and thus, incur a positive compliance cost, while the facility would have a cost saving under the other alternatives analyzed. It is worth mentioning that Alternative B, the more stringent scenario, may lead to more NOx emission reductions and greater cost savings compared to the proposed project (PAR 1135). However, Alternative B may pose many logistical and reliability

challenges to the affected facility which could affect grid stability (e.g., reliability of providing uninterrupted supplies of electricity). Alternatives C and D would both be a cheaper alternative with greater cost savings than the proposed project but would result in fewer NOx emission reductions overall.

INTRODUCTION

South Coast Air Quality Management District (South Coast AQMD) Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities, is an industry-specific rule which applies to electricity generating units (i.e., boilers, turbines, engines, etc.) at investor-owned electric utilities, publicly owned electric utilities, or units having a generation capacity of at least 50 Megawatts (MW) of electrical power for distribution via the state or local electrical grid system. Rule 1135 was adopted in 1989 and amended in 1990, 1991, 2018 and 2022. In 2022, staff was directed to amend Rule 1135 again to include a revised Best Available Retrofit Control Technology (BARCT) assessment for the electricity generating units located on Santa Catalina Island with a specific focus on non-diesel alternatives and ZE/NZE technologies.

Accordingly, Proposed Amended Rule (PAR) 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities, establishes NOx mass emission limits to reflect the BARCT requirements to install ZE/NZE electricity generating equipment, and requirements to remove from service existing prime power diesel-internal-combustion engines for electricity generating units located on Santa Catalina Island. In addition, PAR 1135 establishes provisions for monitoring, reporting and recordkeeping for NZE electricity generating units and the units not required to install CEMS located on Santa Catalina Island. PAR 1135 also includes updates to remove outdated rule provisions and correct rule references, and other editorial changes. Note that PAR 1135 is partly related to the implementation of the 2022 AQMP Control Measure L-CMB-06: NOx Emission Reductions from Electricity Generating Facilities, which involves assessing low NOx and ZE technologies for power generation and replacing existing diesel internal combustion engines with lower-emitting technologies.

The implementation of PAR 1135 will potentially affect one existing electricity generating facility located on Santa Catalina Island, which currently operates six diesel internal combustion engines and 23 microturbines to generate power. The diesel internal combustion engines at this facility produce approximately 10 to 70 times more NOx per unit than any other electricity generating units subject to Rule 1135. As a result, the electricity generating facility located on Santa Catalina Island produces more than 10 percent of NOx emissions from all electricity generating facilities in South Coast AQMD region, while it provides less than 0.06% of the power generated by all the facilities.

PAR 1135 establishes a final NOx mass emission limit of six tpy for the electricity generating facility located on Santa Catalina Island which is based on a BARCT assessment that considered many repower parameters, including electricity demand, power reliability, transmission, grid stability, space limitations, fuel delivery and storage, and challenges for the deployment of new ZE/NZE technologies. The requirements of PAR 1135 that will incur incremental compliance costs include purchasing and installing ZE (e.g., solar photovoltaic cells) and NZE equipment (e.g., propane-fueled linear generators and fuel cells), as well as replacing three existing diesel internal combustion engines and 23 microturbines with three Tier 4 Final diesel engines. To achieve the final six tpy NOx emission limit, a deployment of 30% ZE and 50% NZE equipment with 20% Tier 4 Final diesel engines may be needed in order to meet the electricity demands on Santa Catalina Island. This mix of equipment is estimated to reduce NOx emissions at the facility by 65.3 tpy, or 0.18 ton per day.

LEGISLATIVE MANDATES

The legal mandates directly related to the assessment of PAR 1135 include South Coast AQMD Governing Board resolutions and various sections of the Health and Safety Code.

South Coast AQMD Governing Board Resolution

On March 17, 1989, the South Coast AQMD Governing Board adopted a resolution that calls for an economic analysis associated with adopting and amending rules and regulations that considers all of the following elements:

- Affected industries
- Range of probable costs
- Cost-effectiveness of control alternatives
- Public health benefits

Health and Safety Code Requirements

The state legislature adopted legislation which reinforces and expands the South Coast AQMD Governing Board resolution requiring socioeconomic impact assessments for rule development projects. Health and Safety Code Section 40440.8, which went into effect on January 1, 1991, requires a socioeconomic impact assessment for any proposed rule, rule amendment, or rule repeal which "will significantly affect air quality or emissions limitations."

To satisfy the requirements in Health and Safety Code Section 40440.8, the scope of the socioeconomic impact assessment should include all of the following information:

- Type of affected industries;
- Impact on employment and the regional economy;
- Range of probable costs, including those to industry;
- Availability and cost-effectiveness of alternatives to the rule;
- Emission reduction potential; and
- Necessity of adopting, amending, or repealing the rule in order to attain state and federal ambient air quality standards.

Health and Safety Code Section 40728.5, which went into effect on January 1, 1992, requires the South Coast AQMD Governing Board to: 1) actively consider the socioeconomic impacts of regulations; 2) make a good faith effort to minimize adverse socioeconomic impacts; and 3) include small business impacts. To satisfy the requirements in Health and Safety Code Section 40728.5, the socioeconomic impact assessment should include the following information:

- Type of industries or business affected, including small businesses; and
- Range of probable costs, including costs to industry or business, including small business.

Finally, Health and Safety Code Section 40920.6, which went into effect on January 1, 1996, requires an incremental cost-effectiveness analysis for a proposed rule or amendment which imposes BARCT or “all feasible measures” requirements relating to emissions of ozone, Carbon monoxide (CO), Sulphur oxides (SOx), Nitrogen oxides (NOx), Volatile organic compounds

(VOC) and their precursors. The BARCT and cost-effectiveness analyses for PAR 1135 were conducted and are included in Chapters 2 and 4 of the Draft Staff Report, respectively.

AFFECTED FACILITIES AND EQUIPMENT

The implementation of PAR 1135 will affect one electricity generating facility located on Santa Catalina Island, which currently operates six diesel internal combustion engines and 23 microturbines to generate power. More than 90% of the power generated by the facility is from the six diesel internal combustion engines. However, most of the diesel internal combustion engines are over 29 years old and emit approximately 10 to 70 times more NOx per unit than other electricity generating units subject to Rule 1135. As a result, the electricity generating facility on the island emits more than 10% of total NOx emissions of all electricity generating facilities in the South Coast AQMD region, while producing less than 0.06% of total power generated. Table 1 lists detailed information of the equipment that will potentially be affected by the implementation of PAR 1135:

Table 1
PAR 1135 Affected Equipment

Equipment Type	Rating (MW)	Installation Year	NOx Emissions*
Diesel Engine Unit 7	1	1958	97 ppmv
Diesel Engine Unit 8	1.5	1964	97 ppmv
Diesel Engine Unit 10	1.125	1968	140 ppmv
Diesel Engine Unit 12	1.5	1976	82 ppmv
Diesel Engine Unit 14	1.4	1985	103 ppmv
Diesel Engine Unit 15	2.8	1995	51 ppmv
Microturbines (23 units)	1.49	2011	0.07 lb/MW-hr

Key: ppmv = parts per million by volume, lb/MW-hr = pounds per Megawatt-hour
*Represents estimated emission concentrations for the diesel engines and emission intensity for the microturbines.

Small Business Analysis

South Coast AQMD defines a "small business" in Rule 102 for purposes of fees as one which employs 10 or fewer persons and which earns less than $500,000 in gross annual receipts. South Coast AQMD also defines “small business” for the purpose of qualifying for access to services from the South Coast AQMD’s Small Business Assistance Office (SBAO) as a business with an annual receipt of $5 million or less, or with 100 or fewer employees. In addition to the South Coast AQMD's definitions of a small business, the federal Small Business Administration (SBA) and the federal 1990 Clean Air Act Amendments (1990 CAAA) also provide definitions of a small business.

The 1990 CAAA classifies a business as a "small business stationary source" if it: 1) employs 100 or fewer employees; 2) does not emit more than 10 tons per year of either VOC or NOx; and 3) is a small business as defined by SBA. The SBA definitions of small businesses vary by six-digit

NAICS codes. More specifically, the industry of Fossil Fuel Electric Power Generation (NAICS 221112) has 750 employees as the threshold below which a business is considered as small. Since subsidiaries under the same parent company are interest-dependent, the revenue and employee data of a facility's parent company will be used for the determination of its small business status. The affected electricity generating facility on Santa Catalina Island belongs to Southern California Edison (SCE), whose parent company is Edison International. Using data from Google Finance, Edison International had 13,003 employees and earned revenue of $16.34 billion in 2023.[1] Thus, the affected facility will not be classified as a small business, based on all definitions of small business.

COMPLIANCE COSTS

PAR 1135 establishes a final NOx mass emission limit of six tpy for the electricity generating facility located on Santa Catalina Island which is based on a BARCT assessment that considered many repower parameters, including electricity demand, power reliability, transmission, grid stability, space limitations, fuel delivery and storage, and challenges for the deployment of new ZE/NZE technologies. The requirements of PAR 1135 that will incur incremental compliance costs include purchasing and installing ZE (e.g., solar photovoltaic cells) and NZE equipment (e.g., propane-fueled linear generators and fuel cells), as well as replacing three existing diesel internal combustion engines (identified in Table 1 as Diesel Engine Units 8, 10 and 15) and 23 microturbines with three Tier 4 Final diesel engines. To achieve the final NOx emission limit of six tpy, a deployment of 30% ZE and 50% NZE equipment with 20% Tier 4 Final diesel engines may be needed in order to meet the electricity demands on Santa Catalina Island.

This section estimates the compliance costs of the proposed project (PAR 1135), including both one-time incremental equipment-purchase/installation costs and recurring operation and maintenance (O&M) costs/savings. Because the age of the equipment to be replaced ranges from 29 to 60 years old, the analysis assumed that the three replaced diesel internal combustion engines and 23 microturbines would have no resale value and thus, their replacement would not result in stranded assets. The replacement of the existing diesel internal combustion engines with Tier 4 Final diesel engines is expected between 2027 and 2035. In addition, the deployment of ZE (solar) equipment is anticipated to occur between 2030 and 2035, while the installation of propane-fueled linear generators and fuel cells (NZE equipment) is expected to occur between 2029 and 2035. All equipment is assumed in this analysis to have a useful life of 25 years. To ensure the confidentiality of cost data provided by SCE, the following subsections describe the cost assumptions for the proposed project as a whole, rather than for specific equipment categories, and this information was relied upon to estimate the overall compliance costs of PAR 1135. The costs are presented in 2023 dollars.

Capital/One-Time Costs

Primary Equipment, Ancillary, Shipping and Delivery

SCE estimates indicate that the total one-time purchase costs for all of the equipment needed to achieve the NOx emission limits in PAR 1135 would be $18,170,638, which includes the purchase of primary and ancillary equipment, shipping and delivery.[2] As mentioned earlier in this chapter,

[1] Google Finance, https://www.google.com/finance/quote/EIX:NYSE, accessed on August 6, 2024.
[2] Note that all dollar amounts in this socioeconomic impact assessment are presented in 2023 dollars.

the analysis assumes that the existing diesel engines and microturbines will have no resale value; as such, all of the estimated purchase cost will be incremental for the affected facility.

Equipment Installation

SCE also provided cost data on direct and indirect installation costs. The total direct installation costs are $28,494,579 with the three most expensive items attributed to installation/concrete work, demolition, and load bank for testing, which constitute 67.8%, 7.5% and 4.3% of the total direct installation costs, respectively. The other items included in the total direct installation costs include plant renovation, contract startup and commissioning, contract construction site manager, controller support, construction trailer, contract test technician, and support commissioning. The total indirect installation costs are $10,768,145, and include contract engineering, a repower feasibility study and SCE labor.

Operation & Maintenance (O&M) Costs

Fuel Costs (Including Shipping)

Due to the increased fuel efficiency of the new equipment, fuel costs are anticipated to be substantially lower under the proposed project. The incremental fuel costs/savings are estimated by taking the difference between the fuel costs during baseline conditions/existing setting (e.g., before the implementation of PAR 1135) and the fuel costs associated with implementing PAR 1135 (e.g., replacing aging, more polluting equipment with newer, less polluting technology). According to data provided by SCE, their existing equipment utilizes approximately 1,941,724 gallons per year of diesel and 164,597 gallons per year of propane. To calculate the total fuel costs associated with implementing PAR 1135, this analysis relied upon the California Energy Commission's mid-demand diesel price forecast over the 2025-2050 period, which is $4.92 per gallon in 2023 dollars.[3] However, a long-term price forecast for propane was not available at the time of conducting this analysis, so the current propane price of $1.97 per gallon was relied upon instead.[4] In addition, since both diesel and propane is delivered to the affected facility via barge, the fuel cost estimate includes an annual shipping expense of $16,353,130. In total, the fuel costs for baseline conditions are estimated to be $26,230,668. For implementing PAR 1135, the demand for propane is expected to increase to 900,000 gallons per year due to the eventual deployment of more propane-fueled equipment, while the demand and usage of diesel is expected to reduce to 388,355 gallons per year. Taking into account an increased shipping cost, if PAR 1135 is implemented, the total annual fuel costs are estimated at $5,897,616, which represents an estimated annual fuel-cost saving of $20,333,052.

Maintenance & Parts, Employee & Service Costs

In addition to realizing savings in fuel costs, the new equipment anticipated to be installed as a result of PAR 1135 has the potential of realizing a cost savings on parts and employee costs for maintenance. Specifically, according to the baseline data provided by SCE, the annual maintenance and parts cost are $3,977,434, while the costs associated with implementing PAR 1135 would be $2,386,461, resulting in a net cost savings of $1,590,974. Similarly, SCE's baseline

[3] California Energy Commission, 2021. Presentation - Transportation Energy Demand Forecast, Docket 21-IEPR-03, https://efiling.energy.ca.gov/GetDocument.aspx?tn=240934&DocumentContentId=74780, accessed August 7, 2024.

[4] The propane price relied upon in this analysis is based on the current purchase price as provided by SCE.

data for employee and service costs indicate an annual cost of $8,177,445, while the costs associated with implementing PAR 1135 would be approximately $4,988,869, resulting in a net cost savings of $3,188,576.

Land Lease Costs

In order for solar equipment to be deployed, the affected facility does not have sufficient space within its existing footprint and thus will need to find and lease an offsite location with available land. SCE estimated that a land lease would cost $2,399,206 per year. Because the leased land is specific to solar deployment and not applicable to baseline conditions, all land lease costs will be incremental for the affected facility.

Other O&M Costs

In addition, the O&M costs include other cost categories, including insurance and permitting, hazard materials handling/treatment, annual emissions and performance testing, and propane handling, storage, and safety. Note that all these other O&M costs are almost identical for baseline conditions and under PAR 1135; therefore, incremental costs for these other O&M cost categories are not included in this analysis.

Monitoring, Reporting and Recordkeeping Costs

PAR 1135 also establishes provisions for conducting monitoring, reporting and recordkeeping of NZE electricity generating units, but continuous emissions monitoring systems (CEMS) are not required. Staff confirmed that the affected facility already conducts monitoring, reporting and recordkeeping; therefore, any additional costs associated with monitoring, reporting and recordkeeping due to the implementation of PAR 1135 are expected to be minimal, if any. For this reason, the incremental costs related to monitoring, reporting and recordkeeping are not included in this analysis.

Total Compliance Costs of PAR 1135

The compliance cost analysis covers the period of 2027-2059. To estimate the annual compliance cost of PAR 1135, the one-time capital cost over the 25-year useful life of the equipment was amortized and added to the recurring cost for each compliance year. Because of the recurring cost savings anticipated for the cost categories of maintenance and parts, employee and service, and fuel costs, the implementation of PAR 1135 is expected to result in an overall cost savings. As presented in Table 2, the total present value of cost savings over the forecast period is estimated at $370.71 million and $192.67 million, respectively, depending on the discount rate assumed (1% and 4%).[5] The average annual cost savings due to the implementation of PAR 1135 are estimated to range from $14.99 million to $14.16 million from 2027-2059, depending on different real interest rates assumed (1% to 4%). Table 2 presents the present value of the estimated compliance cost/savings and the average annual cost/savings of PAR 1135 by cost categories.

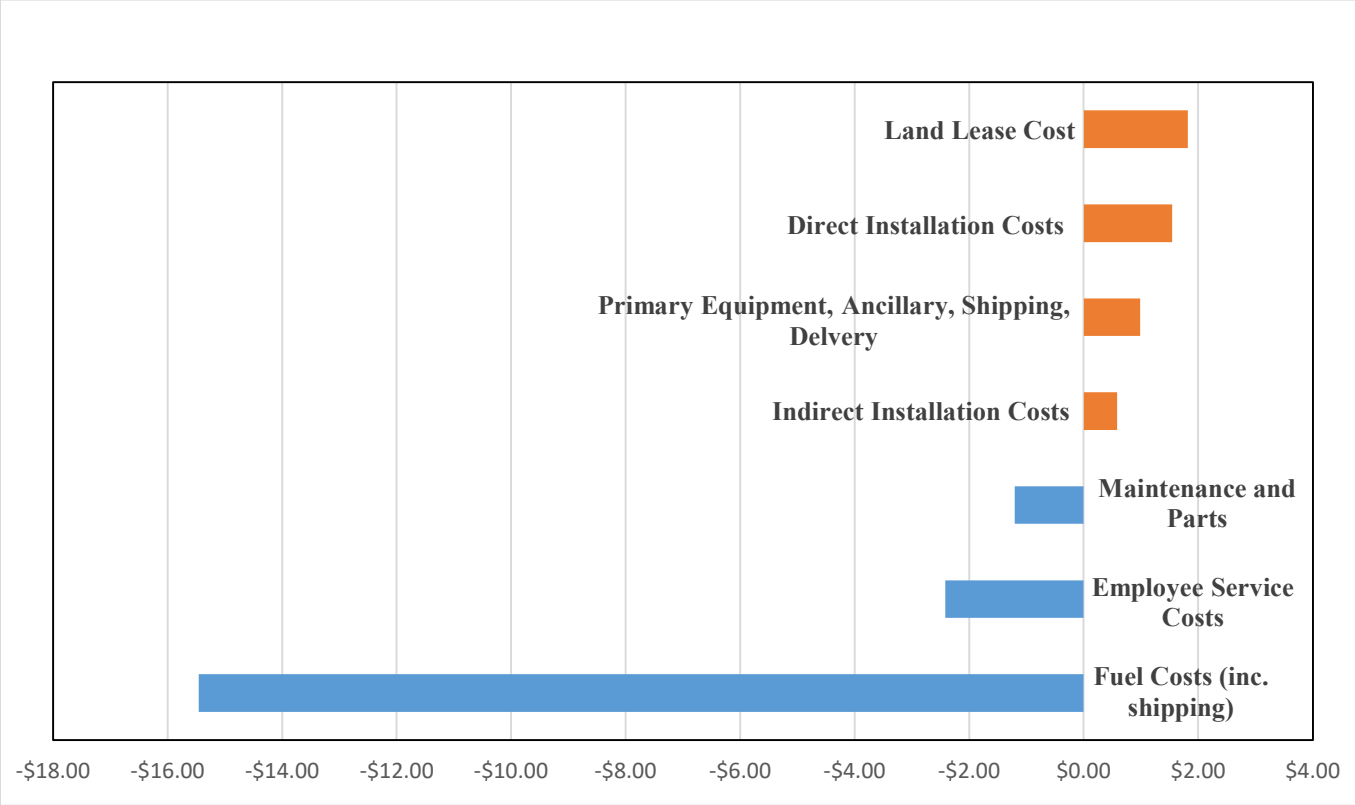
[5] In 1987, South Coast AQMD staff began to calculate cost-effectiveness of control measures and rules using the Discounted Cash Flow method with a discount rate of 4%. Although not formally documented, the discount rate is based on the 1987 real interest rate on 10-year Treasury Notes and Bonds, which was 3.8%. The maturity of 10 years was chosen because a typical control equipment life is 10 years; however, a longer equipment life would not have corresponded to a much higher rate -- the 1987 real interest rate on 30-year Treasury Notes and Bonds was 4.4%. Since 1987, the 4% discount rate has been used by South Coast AQMD staff for all cost-effectiveness calculations, including BACT analysis, for the purpose of consistency.

Table 2
Total Present Worth and Average Annual Estimated Costs of PAR 1135

Cost Categories	Present Value Worth (2024)		Annual Average (2027 – 2059)	
	1% Discount Rate	4% Discount Rate	1% Real Interest Rate	4% Real Interest Rate
Capital Costs				
Primary Equipment, Ancillary, Shipping, Delivery	$26,443,720	$15,125,202	$717,882	$982,838
Direct Installation Costs	$41,468,146	$23,718,830	$1,125,759	$1,541,254
Indirect Installation Costs	$15,670,876	$8,963,382	$425,426	$582,442
Recurring Costs/(Savings)				
Maintenance and Parts	($31,719,683)	($16,790,688)	($1,205,283)	($1,205,283)
Employee Service Cost	($63,571,526)	($33,651,334)	($2,415,588)	($2,415,588)
Fuel Costs (Including Shipping)	($406,836,463)	($215,357,262)	($15,458,955)	($15,458,955)
Land Lease Cost	$47,833,630	$25,320,542	$1,817,580	$1,817,580
Total	**($370,711,300)**	**($192,671,329)**	**($14,993,179)**	**($14,155,712)**

Figure 1 presents the estimated annual compliance costs/savings of implementing PAR 1135 by cost categories. Implementation of PAR 1135 is expected to result in annual incremental compliance costs for land lease, direct and indirect installation costs, and equipment, ancillary, shipping and delivery costs, combined with a massive cost savings for the items such as maintenance and parts, employee and service, and fuel costs. Notably, the deployment of ZE and NZE equipment greatly reduces the demand for diesel and thus will result in an annual fuel-cost savings of $15.46 million.

Figure 1
Annual Estimated Costs/Savings of PAR 1135 by Cost Category (in Millions)



MACROECONOMIC IMPACTS ON THE REGIONAL ECONOMY

The Regional Economic Model (REMI, PI+ v3) was used to assess the total socioeconomic impacts of the anticipated policy change (i.e., PAR 1135 in this case).[6, 7] The model, which is comprised of analytical modules with embedded datasets and econometric features, links the economic activities occurring in the counties of Los Angeles, Orange, Riverside, and San Bernardino, and for each county and considers five interrelated blocks: 1) output and demand; 2) labor and capital; 3) population and labor force; 4) wages, prices and costs; and 5) market shares.[8]

It should be noted that the REMI model is not designed to assess impacts on individual operations. The model was used to assess the impacts of the proposed project on various industries that make up the local economy. Cost impacts on individual operations were assessed outside of the REMI model and used as inputs into the REMI model.

Impacts of PAR 1135

The assessment herein is performed relative to a baseline ("business as usual") forecast where PAR 1135 would not be implemented. This analysis assumes that the affected facility would finance the capital and installation costs of control equipment at a 4% real interest rate and that these one-time costs are amortized and incurred over the life of the equipment. To achieve the final NOx emission limit of six tpy in PAR 1135, the affected facility may purchase and install solar photovoltaic cells (ZE equipment), propane-fueled linear generators and fuel cells (NZE equipment), and replace three existing diesel internal combustion engines and all 23 microturbines with three Tier 4 Final diesel engines. Installing and operating the equipment from the year 2027 onwards would result in an average annual cost savings of approximately $14.99 million when costs/savings are annualized using a 4% real interest rate, or $14.16 million when evaluated using a 1% real interest rate.

Direct effects of PAR 1135 are used as inputs to the REMI model in order for the model to assess secondary and induced impacts for all the industries in the four-county economy on an annual basis and across a user-defined horizon: 2027 (the first year when the affected facility is assumed to incur the compliance cost due to PAR 1135 implementation) to 2059 (when all equipment has been fully amortized). Direct effects of PAR 1135 include: 1) additional costs that the facility would incur by installing control equipment; 2) additional sales by local vendors of equipment, devices, or services which are needed to meet the proposed requirements; and 3) cost savings due to reduced fuel costs, maintenance and parts, employee labor, and service expenses.

In addition to the direct effects, the additional spending on solar equipment, propane-fueled linear generators and fuel cells, Tier 4 Final diesel engines, and land lease would increase the spending

[6] Regional Economic Modeling Inc. (REMI). Policy Insight® for the South Coast Area (70-sector model). Version 3. 2023.

[7] REMI v3 has been updated based on The U.S. Economic Outlook for 2022-2024 from the University of Michigan's Research Seminar in Quantitative Economics (RSQE) release on May 19, 2023, The Long-Term Economic Projections from CBO (supplementing CBO's March 2023 report, The 2023 Long-Term Budget Outlook).

[8] Within each county, the industrial sectors are made up of 156 private non-farm industries and sectors, three government sectors, and a farm sector. Trade flows are captured between sectors as well as across the four counties and the rest of U.S. Market shares of industries are dependent upon their product prices, access to production inputs, and local infrastructure. The demographic/migration component has 160 ages/gender/race/ethnicity cohorts and captures population changes in births, deaths, and migration. For details, please refer to REMI online documentation at http://www.remi.com/products/pi.

and sales of businesses across various sectors, most of which are located in the South Coast AQMD region. Meanwhile, cost savings in fuel costs, maintenance and parts, and employee labor and service expenses would decrease the revenue of other sectors, such as fuel dealers. Table 3 lists the industry sectors modeled in REMI that would either incur cost or benefit from the compliance expenditures.

Table 3
Industries Affected by Compliance Costs/Savings of PAR 1135 in REMI Model

Source of Compliance Cost	REMI Industries Incurring/ Achieving Compliance Costs/Savings (NAICS)	REMI Industries Benefitting/Losing from Compliance Spending/Saving (NAICS)
Subtotal, Purchase Costs	Utilities (22)	*Capital:* Machinery Manufacturing (333)
		Capital: Electrical Equipment, Appliance, and Component Manufacturing (335)
		Capital: Computer and Electric Product Manufacturing (334)
Direct Installation Costs		*Capital:* Construction (23)
Indirect Installation Costs		
Fuel Costs		*Recurring:* Wholesale Trade (42)
Land Lease Cost		*Recurring:* Real Estate (531)
Employee Labor and Service Cost		*N/A**
Maintenance and Parts		

*The wage income earned from employee and service cost, and the category of maintenance and parts is modeled as an increase in compensation for employees in the Fossil Fuel Electric Power Generation industry and thus, does not directly benefit a single industry.

Regional Job Impacts

When the compliance cost is annualized using a 4% real interest rate, the proposed net job impacts per year is close to zero on average from 2027 to 2059. The implementation of PAR 1135 has positive job impacts on the regional economy over time in the sectors of Construction (NAICS 23) and Utilities (NAICS 22) sectors due to compliance expenditures. In 2027, 51 additional jobs are expected to be added to the economy associated with the installation of ZE and NZE electricity generating equipment. These additional jobs are expected to come from sectors such as Construction (NAICS 23), Professional, Scientific and Technical Services (NAICS 54), and Real Estate (531).

However, the implementation of PAR 1135 will also result in jobs foregone in the sectors of Wholesale Trade (NAICS 42) and Professional, Scientific and Technical Services due to the cost savings from fuel and maintenance and parts, which will lead to an anticipated shrink in the markets for diesel wholesale and professional contractors.[9] The biggest negative job impacts are expected to occur in 2036 when approximately 95 jobs forgone are expected in the four-county economy; from the perspective of individual sectors, the sectors of Wholesale Trade, and Professional, Scientific and Technical Services are projected to have 41 and six jobs foregone, respectively.

Overall, the positive job impacts brought about by the installation of ZE/NZE equipment and the jobs foregone resulting from the cost saving will cancel each other out, leading to close-to-zero annual average job impacts over the 2027-2059 period.[10]

It is important to note that these projections of job impacts are based on assumptions and analysis using the REMI model. The actual job impacts may vary depending on various factors and uncertainties in the economy and industry dynamics. As presented in Table 4, many major sectors of the regional economy would experience positive or negative job impacts in later years from the secondary or induced effects of implementing PAR 1135.

[9] Note that the cost savings will benefit Southern California Edison and thus bring about jobs gained in the sector of Utilities (NAICS 22). However, because the sectors of Wholesale Trade and Professional, Scientific and Technical Services are much more labor-intensive than the Utilities sector, the jobs foregone in the former sectors will outweigh the jobs gained in the latter, when the cost savings of PAR 1135 is realized, which results in net jobs foregone.

[10] Specifically, the REMI model predicts a 0.12 job gained over the period, rounded to zero.

Table 4
Projected Job Impacts of PAR 1135 for Selected Industries and Years

Industry (NAICS)	2027	2036	2047	2057	2059	Annual Average (2027-2059)	Baseline Number of Jobs (Average, 2027-2059)	Percent Relative to Baseline
Wholesale Trade (42)	1	-41	-29	-22	-21	-22	412,664	0.0053%
Couriers and Messengers (492)	0	-7	-5	-5	-5	-4	285,800	0.0014%
Ambulatory Health Care Services (621)	2	-7	-3	-2	-2	-2	749,889	0.0003%
Personal and Laundry Services (812)	1	-4	-2	-2	-2	-2	449,350	0.0004%
State and Local Government (NA)	2	-4	1	1	2	0	983,463	0%
Computer and Electronic Product Manufacturing (334)	1	0	1	1	1	1	120,786	0.0008%
Professional, Scientific, and Technical Services (54)	2	-6	5	7	7	3	1,079,713	0.0003%
Real Estate (531)	2	2	5	5	5	4	790,077	0.0005%
Utilities (22)	0	5	11	10	10	7	21,192	0.0330%
Construction (23)	25	3	17	10	10	16	587,476	0.0027%
Other Industries	10	-32	1	5	6	-2	7,506,336	0%
All Industries	**51**	**-95**	**4**	**13**	**15**	**0**	**12,986,747**	**0%**

Note: Totals may not sum due to rounding.

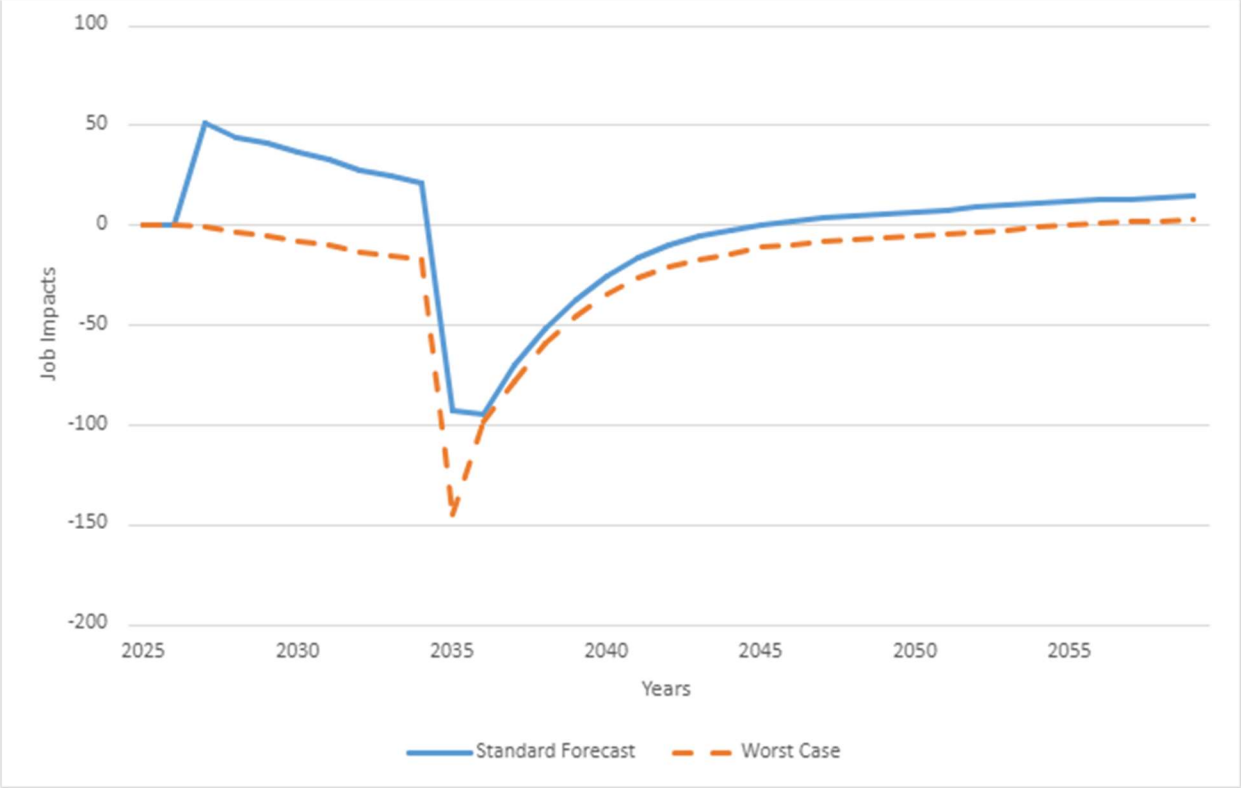
In addition, in 2013, South Coast AQMD contracted with Abt Associates Inc. to review the South Coast AQMD socioeconomic assessments for Air Quality Management Plans and individual rules with the goal of providing recommendations that could enhance South Coast AQMD's socioeconomic analyses. In 2014, Abt Associates Inc. published a report which included a recommendation for South Coast AQMD to enhance socioeconomic analyses by testing major assumptions through conducting a scenario analysis. As such, South Coast AQMD generally includes in Socioeconomic Impact Assessments an alternative worst-case scenario which assumes that the affected facilities would purchase all feasible monitoring equipment and services from providers located outside of the South Coast AQMD's jurisdiction.[11] This hypothetical scenario tests the sensitivity of the previously discussed scenarios where the analyses rely on REMI's embedded assumptions about how the capital and O&M spending would be distributed inside and

[11] Abt Associates Inc., August 2014, Review of the SCAQMD Socioeconomic Assessments, Chapter 6, Section 3, https://www.aqmd.gov/docs/default-source/Agendas/aqmp/scaqmd-report---review-socioeconomic-assessments.pdf, accessed August 16, 2024.

outside the region. As a practical matter, however, increased jobs in the manufacturing and construction sectors related to the purchase and installation of ZE/NZE electricity generating equipment are likely to be offered by local equipment manufacturers and contractors.

This alternative worst-case scenario would result in an annual average of approximately 20 jobs foregone. The 20 jobs foregone represents roughly 0.0002% of total jobs in the South Coast AQMD region. Figure 2 presents a projected time series of job impacts over the 2027 - 2059 period for both the standard and worst-case forecasts.

Figure 2
Projected Regional Job Impacts, 2027-2059



Competitiveness

The overall cost savings brought about by PAR 1335 would decrease the cost of services rendered by the Utilities sector in the region. The magnitude of the impact is dependent upon the size, diversification, and infrastructure in a local economy as well as interactions among industries. However, a large, diversified, and resourceful economy would absorb the aforementioned impacts with relative ease.

Meanwhile, changes in production/service costs in the Utilities sector would also affect the prices of goods produced locally in other sectors. Note that the relative delivered price of goods is based on the costs of production and transportation necessary to deliver the goods to where they will be

consumed or used. In addition, the average price of goods at the place of use reflects prices of local production combined with the cost of and importing them elsewhere.

According to the REMI Model, the implementation of PAR 1135 will have minimal impact on the relative delivered price and the production cost across various sectors. Among all sectors, the Utilities sector will be the most affected in 2035, when the relative delivered price and production cost will decrease in the South Coast AQMD jurisdiction by 0.051% and 0.083%, respectively, due to the cost savings of PAR 1135. On average, the relative delivered price and production cost in the Utilities sector will minimally decrease by 0.034% and 0.056%, respectively, over the period 2027-2059.

CEQA ALTERNATIVES

The California Environmental Quality Act (CEQA) requires an evaluation of alternatives when a proposed project may have significant adverse environmental impacts. Because potentially significant operational air quality impacts may occur if PAR 1135 is implemented, four alternatives were developed for the CEQA analysis conducted in the Draft Subsequent Environmental Assessment (SEA): Alternative A – No Project, Alternative B – More Stringent, Alternative C – Less Stringent, and Alternative D – No ZE Equipment. This section provides a description of each alternative as well as an assessment of possible socioeconomic impacts resulting from these alternatives.

Alternative A – No Project

CEQA requires the evaluation of a specific "No Project" alternative which considers what would happen if the proposed project (PAR 1135) were not approved, i.e., no amendments would be made to Rule 1135. Under Alternative A, the "No Project" scenario, the January 2022 amendments to Rule 1135 would remain in effect, which requires the electricity generating facility on Santa Catalina Island to comply with the final annual NOx limit of 13 tpy by January 1, 2026, but with an option to extend the deadline to January 1, 2029. Additionally, under Alternative A, the installation of any new diesel internal-combustion engines would be prohibited on or after January 1, 2024. Note that the continued implementation of the 2022 amendments to Rule 1135 will not impose any additional costs on the affected facilities.

Prior to the 2022 amendments, Rule 1135 was amended in November 2018 which aimed to reduce NOx emissions via a transition from South Coast AQMD Regulation XX – Regional Clean Air Incentives Market (referred to as the NOx RECLAIM program) to a command-and-control rule subject to South Coast AQMD Regulation XI – Source Specific Standards. The greatest compliance cost of the 2018 amendment was associated with installing natural gas turbines and replacing old diesel engines. The 2018 amendments to Rule 1135 had an estimated annual cost of $11.42 million with 32 affected facilities which emitted 662.98 tons of NOx in 2017. The electricity generating facility on Santa Catalina Island emitted 75.43 tons of NOx, or 11.38% of the total 662.98 tons of NOx emissions. At the time for the 2018 amendments to Rule 1135, the compliance costs of Alternative A were estimated based on the compliance costs for the entire universe of affected facilities. For the currently proposed project (PAR 1135) which affects one facility, the cost analysis of Alternative A relies on taking the proportion of NOx emissions only attributed to the facility on Santa Catalina Island, (e.g., the NOx emissions share of 11.38%). As

such, the analysis of Alternative A for PAR 1135 estimated an annual compliance cost of roughly $1.3 million in 2023 dollars using a 4% real interest rate.

Alternative B – More Stringent

For PAR 1135, the facility on Santa Catalina Island will be required to meet the final six tpy NOx emission limit by 2035. Alternative B analyzes a scenario that is more stringent than PAR 1135 where the final NOx emission limit is 1.8 tpy by 2035. In order to reduce NOx emissions to 1.8 tpy, under Alternative B electricity on Santa Catalina Island will need to be generated from a combination of 65% NZE equipment, 30% ZE equipment, and 5% from Tier 4 Final diesel engines. Using a 4% real interest rate, Alternative B is estimated to result in an annual cost savings of $14,608,768 over the 2027-2059 period. Note that compared to the proposed project (PAR 1135) which assumes that electricity will be produced from a combination of 50% NZE equipment, 30% ZE equipment, and 20% Tier 4 Final diesel engines, Alternative B would lead to a greater cost savings than PAR 1135 and could achieve more NOx emission reductions by an additional 4.2 tpy. However, according to SCE's representatives, the implementation of Alternative B would pose many logistical and reliability challenges to the affected facility which could affect grid stability (e.g., reliability of providing uninterrupted supplies of electricity).

Alternative C – Less Stringent

For PAR 1135, the facility on Santa Catalina Island will be required to meet the final six tpy NOx emission limit by 2035. Alternative C analyzes a scenario that is less stringent than PAR 1135 where the final NOx emission limit is 13 tpy by 2035. By having to reduce fewer NOx emissions under Alternative C by 2035, electricity on Santa Catalina Island could be generated from a combination of 50% NZE equipment, and 50% from Tier 4 Final diesel engines at a lower cost than PAR 1135. Implementing Alternative C would result in seven tpy more NOx emissions than PAR 1135 with an average annual cost savings of $15,590,383 over the period from 2027 to 2059, using a 4% real interest rate.

Alternative D – No ZE Equipment

For PAR 1135, the facility on Santa Catalina Island will be required to meet the final six tpy NOx emission limit by 2035. Alternative D analyzes a scenario that does not rely on the use of ZE equipment and is less stringent than PAR 1135 where the final NOx emission limit is 13 tpy by 2030. By having to reduce fewer NOx emissions under Alternative D but by 2030, which is five years earlier than what is considered under Alternative C, electricity on Santa Catalina Island could also be generated from a combination of 50% NZE equipment, and 50% from Tier 4 Final diesel engines at a lower cost than PAR 1135.

Similar to Alternative C, Alternative D would result in seven tpy more NOx emissions compared to PAR 1135 with an average annual cost savings of $18,592,220 over the 2027-2054 period, using a 4% real interest rate.

Summary of CEQA Alternatives Analysis

Table 5 presents a summary of the CEQA alternatives analyzed in terms of annual average cost/savings, net present value (NPV) of compliance costs/savings, and forecasted job impacts. The job impacts of Alternative A is forecasted for the 2019-2045 period, according to the Socioeconomic Impact Assessment previously conducted for the 2018 amendments to Rule 1135.

The annual job impacts for PAR 1135, Alternative B and Alternative C are forecasted for the 2027-2059 period. The annual job impacts for Alternative D is analyzed over the 2027-2054 period.

Table 5
Average Annual Costs, NPV and Job Impacts by CEQA Alternative

Alternatives	Average Annual Cost/Savings (4%)	NPV (4%)	Average Annual Job Impacts
Proposed Project (PAR 1135)	($14,155,712)	($192,671,329)	0
Alternative A — No Project	$1,300,132	$20,112,958	-15
Alternative B — More Stringent	($14,608,768)	($198,838,688)	0
Alterative C — Less Stringent	($15,590,383)	($214,061,243)	4
Alternative D — No ZE Equipment	($18,592,220)	($266,166,011)	5

Under Alternative A, the facility on Santa Catalina Island would still be subject to the 2018 amendment to Rule 1135, and thus, incur a positive compliance cost, while the facility would have a cost saving under the other alternatives analyzed. It is worth mentioning that Alternative B, the more stringent scenario, may lead to more NOx emission reductions and greater cost savings compared to the proposed project (PAR 1135). However, Alternative B may pose many logistical and reliability challenges to the affected facility which could affect grid stability (e.g., reliability of providing uninterrupted supplies of electricity). Alternatives C and D would both be a cheaper alternative with greater cost savings than the proposed project but would result in fewer NOx emission reductions overall.

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