ATTACHMENT G

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Socioeconomic Assessment for
PROPOSED AMENDED RULE 1193— CLEAN ON-ROAD RESIDENTIAL AND COMMERCIAL REFUSE COLLECTION VEHICLES

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Proposed Amended Rule (PAR) 1193 has been modified since the release of the draft socioeconomic report on May 4th, 2010. The modifications include language clarifications, additional compliance options, and additional exemptions. The net effect of the modifications creates a change in the compliance schedule, a potential reduction in the number of vehicles affected by the proposed amendments, and a potential reduction in compliance cost. As a result, the modifications should lower the socioeconomic impacts presented herein.

EXECUTIVE SUMMARY

A socioeconomic analysis was conducted to assess the impacts of Proposed Amended Rule (PAR) 1193–Clean On-Road Residential and Commercial Refuse Collection Vehicles. A summary of the analysis and findings is presented below.

Elements of Proposed Rule	PAR 1193 clarifies the applicability of requirements for public fleet operators, except federal fleets, to purchase alternative-fuel rolloff, transfer, and solid waste collection vehicles in consideration of the February 6, 2008 settlement agreement between the Engine Manufacturers Association (EMA), Western States Petroleum Association (WSPA), and the AQMD. The proposed amendments enhance rule applicability criteria to focus on solid waste collection fleet management practices at the discretion of governmental agencies. PAR 1193 would require the purchase of alternative-fuel solid waste collection vehicles upon contract initiation or renewal by a government agency and when adding or replacing vehicles in existing fleets where the combined total government and private vehicles used under contract is 15 or more. PAR 1193 would accelerate the purchase of alternative-fuel vehicles and the retirement of diesel vehicles used for solid waste collection. Two Scenarios are analyzed herein. Scenario 1 is the proposed amendments, as of April 2, 2010. Scenario 2 differs from Scenario 1 in its application of the criteria to commercial solid waste collection contracts between private fleets and government agencies by allowing greater flexibility in the use of existing diesel vehicles in these contracts.
Affected Facilities and Industries	PAR 1193 would affect approximately 45 facilities in the waste management and remediation services [North American Industry Classification System (NAICS) 562] sector of the South Coast's regional economy. Additional affected facilities are in the nonstore retail sector (NAICS 454), which includes fuel dealers.
Assumptions	Scenario 1 would require government agencies contracting for solid waste collection services to ensure that 100 percent of the vehicles used under the contract are alternative-fuel vehicles within two or three years (depending on the size of the fleet) of contract execution. Full implementation of Scenario 1 would be January 1, 2020.

Assumptions (continued)	Scenario 2 would require government agencies contracting for residential solid waste collection services to ensure 100 percent of the vehicles used under the contract are alternative-fuel vehicles. For new or renewed solid waste collection commercial service contracts, government agencies are required to ensure 100 percent alternative-fuel vehicle conversion within four years from the date of contract execution. Scenario 2 also provides a compliance option for government agencies that allows commercial solid waste collection service contracts initiated or renewed prior to January 1, 2020 to include diesel vehicles that are not older than 12 model years. Scenario 2 would be fully implemented by no later than January 1, 2020. Under Scenario 2, the accelerated purchase requirements of PAR 1193 do not affect commercial fleets with fewer than 15 vehicles under a franchise agreement. Each scenario would result in a different mix of diesel and alternative-fuel vehicles. The cost of newly purchased alternative-fuel vehicles is assumed to be about $300,000 with their maintenance cost at $3.50 per diesel equivalent gallon [dge] used. The price of alternative fuel is assumed to be $2.30 per dge. The scrap value of used diesel vehicles retired is assumed to be $2,500 on average. Both scenarios would accelerate the construction of 13 alternative-fuel filling stations to provide fuel for the alternative fueled vehicles. The assumed cost of construction for each filling station is $3 million and the operation and maintenance cost of alternative-fuel filling stations is $0.075 per dge delivered.
Compliance Costs	The average annual total cost and the distribution of the costs to sectors would be similar under both implementation scenarios. Under Scenario 1, the average annual total cost is projected to be $14.4 million from 2010 to 2025. Under Scenario 2, the average annual total cost would be $13.3 million over the same period. Under Scenario 1, 93 percent of average annual cost ($13.4 million) would occur in the waste management and remediation services sector (NAICS 562) and seven percent ($1 million) would occur in the nonstore retail sector (NAICS 454). Under Scenario 2, 93 percent of the average annual costs ($12.4 million) would occur in the waste management and remediation services sector and seven percent ($0.9 million) would occur in the nonstore retail sector.

Compliance Costs (continued)	The total cost is comprised of the costs associated with accelerating the purchase of alternative-fuel solid waste collection vehicles and the costs associated with accelerating construction of alternative-fuel filling stations. The average annual cost of accelerating alternative-fuel vehicle purchases from 2010 to 2025 in Scenarios 1 and 2 is $17.5 million and $15.7 million, respectively. Scenarios 1 and 2 would reduce fuel costs for solid waste collection vehicle fleets because of the lower price of alternative-fuels relative to diesel fuel. The annual average fuel savings for Scenarios 1 and 2 are $4.1 million and $3.3 million, respectively. The early retirement of diesel vehicles will also generate income for fleet operators in both scenarios. The average annual income from diesel retirement under Scenarios 1 and 2 is projected to be about $0.1 million. The average annual cost of accelerating alternative-fuel filling station construction from 2010 to 2025 in Scenarios 1 and 2 is $1 million and $0.9 million, respectively. Facilities bearing these construction costs sell alternative fuels for use in solid waste collection vehicles and are part of the nonstore retail sector.
Employment Impacts	The overall job impacts are similar for both scenarios. Under Scenario 1, 195 jobs or 0.000195 percent of total jobs in the four county region could be forgone annually, on average, between 2010 and 2025. Under Scenario 2, 172 jobs or 0.000172 percent of total jobs in the four county region, could be forgone annually, on average, between 2010 and 2025. Job impacts in the local economy at the sector level relative to total industry employment are modest.
Competitiveness	Adoption of the proposed rule is expected to cause very few changes in the relative costs of production and prices of goods in the local economy. The impacts on the cost of production and prices for Scenarios 1 and 2 are similar. Under Scenario 1 and Scenario 2, the waste management and remediation sector (NAICS 562) would experience an increase in the cost of production of about 0.5%, or less, from 2010 to 2025. All other sectors would experience an increase of less than 0.003 percent in the cost of production in most years from 2010 to 2025 under both scenarios.

Competitiveness (continued)	Under Scenario 1 and 2, an increase in the delivered price in the waste management and remediation sector of 0.4 percent or less, would occur from 2010 to 2025. In all other sectors, both scenarios would increase the price of delivered goods by less than 0.003 percent from 2010 to 2025.

INTRODUCTION

Proposed Amended Rule 1193 (PAR 1193) clarifies the applicability of requirements for public fleet operators, except federal fleets, to purchase alternative-fuel rolloff, transfer, and solid waste collection vehicles in consideration of the February 6, 2008 settlement agreement between the Engine Manufacturers Association (EMA), Western States Petroleum Association (WSPA), and the AQMD. The proposed amendments enhance rule applicability criteria to focus on solid waste collection fleet management practices at the discretion of governmental agencies. As a result, the proposed amendments specify a compliance obligation for public fleets and private fleets where the combined total of vehicles operated by, or under contract with, a governmental agency is 15 or more. Upon adoption, the proposed rule amendments require these fleets to purchase or lease alternative-fuel vehicles when vehicles are added to, or replaced in, an existing fleet of rolloff, transfer, or solid waste collection vehicles. A similar requirement applies to the formation of new fleets. The proposed amendments will accelerate the transition of solid waste collection fleets from diesel to alternative-fuel vehicles.

The socioeconomic assessment herein analyzes the impacts of the proposed rule amendments on affected facilities and the entire economy in the four-county region. The analysis includes a comparison of two scenarios with different implementation schedules.

REGULATORY HISTORY

Rule 1193—Clean On-Road Residential and Commercial Refuse Collection Vehicles—was adopted by the AQMD's Governing Board in 2000. Rule 1193 was amended in 2002 and 2003. The rule requires public and private solid waste collection fleet operators with 15 or more vehicles to purchase alternative-fuel or dual-fuel solid waste collection vehicles when adding or replacing vehicles in an existing fleet or forming a new fleet. The rule was intended to reduce nitrogen oxide emissions 695 tons/year and particulate matter emissions 68 tons/year by 2010, and also reduce air toxic emissions. The total average annual cost of the rule was estimated at $14.7 million from 2001 to 2015.

Rule 1193 was amended in 2002 to extend a sunset provision on the purchase of dual-fuel solid waste collection vehicles for one year. Dual-fueled engines were estimated to be less costly than alternative-fuel vehicles. Therefore, the proposed amendments were expected to result in savings to owners or operators of refuse collection vehicles. After reviewing newly available emissions data on in-use dual-fuel vehicles with particulate matter traps, the AQMD Governing Board in 2003 extended the sunset provision for an additional year and included pilot-ignition heavy-duty solid waste collection vehicles as a compliance option. Both amendments resulted in savings for affected fleet operators.

LEGISLATIVE MANDATES

The socioeconomic assessments at the AQMD have evolved over time to reflect the benefits and costs of regulations. The legal mandates directly related to the assessment of the proposed rule include the AQMD Governing Board resolutions and various sections of the California Health & Safety Code (H&SC).

AQMD Governing Board Resolutions

On March 17, 1989 the AQMD Governing Board adopted a resolution that calls for preparing an economic analysis of each proposed rule for the following elements:

- Affected Industries
- Range of Control Costs
- Cost Effectiveness
- Public Health Benefits (see staff report)

On October 14, 1994, the Board passed a resolution which directed staff to address whether the rules or amendments brought to the Board for adoption are in the order of cost effectiveness as defined in the AQMP. The intent was to bring forth those rules that are cost effective first.

Health & Safety Code Requirements

The state legislature adopted legislation that reinforces and expands the Governing Board resolutions for socioeconomic assessments. H&SC Sections 40440.8(a) and (b), which became effective on January 1, 1991, require that a socioeconomic analysis be prepared for any proposed rule or rule amendment that *"will significantly affect air quality or emissions limitations."* Specifically, the scope of the analysis should include:

- Type of Affected Industries
- Impact on Employment and the Economy of the District
- Range of Probable Costs, Including Those to Industries
- Emission Reduction Potential
- Necessity of Adopting, Amending or Repealing the Rule in Order to Attain State and Federal Ambient Air Quality Standards
- Availability and Cost Effectiveness of Alternatives to the Rule

For emission reduction potential, necessity of rule adoption and cost effectiveness of alternatives to the proposed rule, please refer to the Staff Report for PAR 1193. Additionally, the AQMD is required to actively consider the socioeconomic impacts of regulations and make a good faith effort to minimize adverse socioeconomic impacts. H&SC Section 40728.5, which became effective on January 1, 1992, requires the AQMD to:

- Examine the type of industries affected, including small businesses; and
- Consider socioeconomic impacts in rule adoption

H&SC Section 40920.6, which became effective on January 1, 1996, requires that incremental cost effectiveness be performed for a proposed rule or amendment setting a Best Available Retrofit Control Technology (BARCT) requirement or a "feasible measure" relating to ozone, carbon monoxide (CO), oxides of sulfur (SO_x), oxides of nitrogen (NO_x), and their precursors. Incremental cost effectiveness is defined as the difference in costs divided by the difference in emission reductions between one level of control and the next more stringent control.

Incremental cost effectiveness for this proposed rule is addressed in the Staff Report for PAR 1193.

AFFECTED FACILITIES

The proposed amendments will affect facilities in the waste management and remediation services [North American Industry Classification System (NAICS) Code 562] and nonstore retail (NAICS 454) sectors. Staff estimates that 45 firms in waste management and remediation services sector would be affected by the proposed amendments. Approximately, 59 percent of affected facilities are in Los Angeles County, 18 percent are in Orange Country, 11 percent are in Riverside County, and 12 percent are in San Bernardino County. The analysis assumes alternative-fuel dealers, part of the nonstore retail sector (NAICS 454), would also be affected by the proposed amendments by accelerating the construction of alternative fuel filling stations. Under Scenario 2, commercial fleets with fewer than 15 vehicles under franchise agreements are subject to the same requirement as public fleets. When a vehicle is replaced or added to one of these fleets, it must be alternative-fuel under existing rule requirements. Therefore, the accelerated purchase requirements of PAR 1193 do not affect commercial fleets with fewer than 15 vehicles under a franchise agreement.

Small Businesses

The AQMD defines a "small business" in Rule 102 as one which employs 10 or fewer persons and that earns less than $500,000 in gross annual receipts. In addition to the AQMD's definition of a small business, the federal Small Business Administration (SBA), the federal Clean Air Act Amendments (CAAA) of 1990, and the California Department of Health Services (DHS) also provide definitions of a small business.

The SBA's definition of a small business uses the criteria of gross annual receipts (ranging from $0.75 million to $35.5 million), number of employees (ranging from 50 to 1,500), megawatt hours generated (4 million), or assets ($175 million), depending on industry type (US SBA, 2008). The SBA definitions of small businesses vary by 6-digit NAICS code. For example, in the Waste Collection Sector (NAICS 562111) gross annual receipts of less than $12.5 million is considered “small.”

The CAAA classifies a facility 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.

Of the 45 facilities examined, data on gross annual receipts and employment was available for 28 facilities. Data on emissions of VOC and NOx were available for two of the 45 facilities. Applying the small business criteria to the facilities with adequate data for evaluation revealed that 12 facilities meet the SBA criteria for small business designation. Under the AQMD criterion for small businesses, 8 affected facilities would be categorized as small businesses. Under the CAAA definition, two facilities are designated as small businesses.

COMPLIANCE COST

Two scenarios are analyzed. Scenario 1 is the proposed amendments, as of April 2, 2010. Upon adoption, Scenario 1 would require that public fleets and private fleets purchase or lease alternative-fuel vehicles when the combined total of vehicles operated by, or under contract with, a governmental agency is 15 or more. Prior to January 1, 2012, Scenario 1 would also require government agencies contracting for solid waste collection services to ensure that 100 percent of the vehicles used under the contract are alternative-fuel vehicles within three years of contract execution. Scenario 1 would include a 100 percent alternative-fuel vehicle compliance deadline for all government solid waste collection contracts of January 1, 2014.

Scenario 2 would require government agencies contracting for residential solid waste collection services to ensure 100 percent of the vehicles used under the contract are alternative-fuel vehicles. For new or renewed solid waste collection commercial service contracts, government agencies are required to ensure 100 percent alternative-fuel vehicle conversion within four years from the date of contract execution. Scenario 2 also provides a compliance option for government agencies that allows commercial solid waste collection service contracts initiated or renewed prior to January 1, 2020 to include diesel vehicles that are not older than 12 years. Scenario 2 would fully implement the 100 percent alternative-fuel vehicle conversion by January 1, 2020.

Cost Assumptions

The estimated compliance costs for Scenarios 1 and 2 of PAR 1193 included the cost of accelerating the acquisition of alternative-fuel vehicles for currently-affected fleet owners, the cost of acquiring alternative-fuel vehicles for newly-affected fleet operators, the associated fuel switching costs for affected vehicles, and the cost of accelerating construction of alternative-fuel filling stations. The distribution of these costs among affected facilities depends on the size of the affected fleets and fleet management practices. These costs are compared to the costs associated with existing Rule 1193. Table 1, below, summarizes data used for the socioeconomic analyses of Scenarios 1 and 2.

Table 1
PAR 1193 Assumptions

Cost Analysis Assumptions	Affected Fleets			
	Private			Public
Fleet Size	51+	15-50	1-14	1-14
# of Vehicles	2629	226	98	12
Economic Life (Yrs.)	15	22	22	7
Vehicle Useful Life (Yrs.)	22			
Alt-Fuel Vehicle Price (New)	$302,600			
Diesel Price (New)	$264,800			
Alt-Fuel Price per dge*	$2.31			
Diesel Price per gallon	$2.95			
Maintenance per dge	$3.53			
Fueling Station Construction Costs	$3 million/station			
Fueling Station Maintenance Costs	$0.075/dge			

*dge = diesel gallon equivalent

Alternative-Fuel Solid Waste Collection Vehicles

Both scenarios assume the accelerated purchase of approximately 90 vehicles per year over a 10 year period. The accelerated purchase schedule assumes 30 percent of affected vehicles are operating under Evergreen Contracts/Fixed Term Option Years. All vehicles providing services under Evergreen Contracts/Fixed Term Option Years are assumed to be affected in the first year (2010) of implementation of the proposed amendments.

For Scenario 1, the remaining 70 percent of affected vehicles are assumed to be operating under fixed term contracts, 10 percent of these would be affected per year from 2011 to 2017. Furthermore, an estimated additional 110 vehicles in privately and publicly-owned fleets of fewer than 15 vehicles would be subject to a new requirement to purchase alternative-fuel vehicles.

Scenario 2 would require that all new and renewed residential solid waste collection contracts include 100 percent alternative-fuel vehicles, which increases the number of alternative-fuel vehicle purchases in 2011 relative to Scenario 1. The additional flexibility in Scenario 2 regarding the use of diesel vehicles for commercial solid waste collection service contracts would reduce alternative-fuel vehicle purchases relative to Scenario 1 in the remaining years until full implementation in 2020. Under Scenario 2, 110 solid waste collection vehicles owned by privately and publicly owned-fleets of fewer than 15 vehicles would also be subject to a new requirement to purchase alternative-fuel vehicles.

For both scenarios, the purchase of a new alternative-fuel vehicle is assumed to trigger the sale of the diesel vehicle replaced. Except for the 12 public fleet vehicles affected, the analysis assumes used diesel vehicles are scrapped. The scrap value of a used diesel is assumed to be $2,500 on average. For the 12 public fleet vehicles, the incremental income from the early sale

of used diesels is assumed to be $16,000 per vehicle. The full vehicle costs, including the cost of borrowing at a four-percent real interest rate, are spread over the economic life of vehicles to annualize them.

Staff estimates that solid waste collection vehicles use 10,000 diesel equivalent gallons (dge) annually. Recent published data from the U.S. Energy Information Administration indicates that switching to alternative fuels from diesel fuel would result in a savings of $0.64 per dge, or an annual fuel savings of $6,400 per vehicle.

Fueling Stations

Both scenarios would accelerate the construction of 13 fueling stations with a majority of new stations located at transfer stations or landfills. A new fueling station is assumed to cost approximately $3 million (based on the estimated cost to construct a liquefied/compressed natural gas fueling station) to build in both scenarios. Fuel station's operation and maintenance (O&M) costs depend on the annual utilization (measured in dge delivered). Staff data suggests the O&M cost of a filling station is approximately $0.075 per dge. There are minor differences in the schedules for alternative-fuel filling station construction under the two scenarios because of differences in the number of alternative-fuel solid waste collection vehicles that require fuel station services over time. The cost of fueling stations is annualized over a 30 year economic life assuming a four-percent real interest rate.

Costs by Industry

The difference between the streams of annualized capital (i.e., alternative-fuel vehicles and fueling station construction) costs, annual fuel costs, and the resale values of used diesel vehicles for each scenario and the existing rule is used to calculate the incremental cost (relative to the Baseline) for Scenarios 1 and 2. Tables 2 and 3 provide a summary of the annual incremental costs for each scenario over the period of 2010 to 2025 compared to the cost associated with the existing rule.

Of the $14.4 million average annual costs for Scenario 1, 93 percent would be incurred in the waste management and remediation services sector (NAICS 562) due to the accelerated purchase of alternative-fuel vehicles. Table 2 shows that the compliance costs of Scenario 1 grow continuously from the date of adoption until full implementation in 2020. From 2014 to 2020, the costs steadily increase by about $0.55 million per year. After all affected diesel vehicles have been replaced with alternative-fuel vehicles the incremental compliance costs of Scenario 1 begin to decline by about $5 million per year. The sale of used diesel vehicles is a source of income for fleet owners in most years analyzed. Beginning in 2021, the sale of used diesels represents a cost on an incremental basis due to the accelerated schedule of diesel sales. Selling used diesel vehicles earlier than would have occurred under the baseline scenario implies that accelerated sales results in forgone income from diesel vehicle sales that would have taken place later under the Baseline scenario. Switching from diesel to alternative fuels and the early sale of used diesel vehicles would represent significant savings from the implementation of Scenario 1.

For Scenario 1, Table 2 shows that the nonstore retail sector (NAICS 454), which includes fuel dealers, would have $1.1 million in annual average compliance costs. The incremental compliance costs of nonstore retailers from the accelerated construction of 13 alternative-fuel filling stations comprise approximately seven-percent of the total annualized compliance costs.

Table 2
Annual (2010-2025) Incremental Cost (in $Millions)—Scenario 1

Year	Alt-Vehicle Purchase	Fuel Savings	Used Diesel Salvage	Stations	Total
2010	$0.00	$0.00	$0.00	$0.00	$0.00
2011	$2.09	-$0.60	-$0.24	$0.24	$1.50
2012	$12.17	-$3.08	-$0.97	$0.69	$8.81
2013	$19.53	-$4.93	-$0.73	$1.08	$14.96
2014	$24.83	-$5.72	-$0.55	$1.41	$19.97
2015	$25.32	-$5.78	-$0.09	$1.43	$20.88
2016	$25.81	-$5.85	-$0.09	$1.45	$21.33
2017	$26.30	-$5.91	-$0.09	$1.47	$21.78
2018	$26.78	-$5.96	-$0.11	$1.49	$22.20
2019	$27.26	-$6.01	-$0.11	$1.51	$22.64
2020	$27.73	-$6.06	-$0.11	$1.53	$23.09
2021	$22.67	-$5.06	$0.41	$1.39	$19.40
2022	$17.60	-$4.05	$0.41	$1.07	$15.03
2023	$12.53	-$3.05	$0.41	$0.76	$10.65
2024	$7.47	-$2.05	$0.41	$0.45	$6.27
2025	$2.40	-$1.05	$0.41	$0.14	$1.90
Average	$17.53	-$4.07	-$0.07	$1.01	$14.40

*The minus sign (-) indicates savings.

Of the $13.3 million average annual costs for Scenario 2, 93 percent is incurred in the waste management and remediation services sector (NAICS 562) due to the accelerated purchase of alternative-fuel vehicles. Table 3 shows that the compliance costs of Scenario 2 also grow continuously from the date of adoption until full implementation in 2020. From 2014 to 2020, the costs steadily increase by about $1.5 million per year. After all affected diesel vehicles have been replaced with alternative-fuel vehicles the incremental compliance costs of Scenario 2 begin to decline by about $5 million per year. The sale of used diesel vehicles is also a source of income for fleet owners in most years analyzed. Beginning in 2021, the sale of used diesels represents a cost on an incremental basis due to the accelerated schedule of diesel sales. Selling used diesel earlier than would have occurred under the baseline scenario implies that accelerated sales results in forgone income from diesel vehicle sales that would have take place later under the baseline scenario. Switching from diesel to alternative fuels and the early sale of used diesel vehicles would also represent significant savings from the implementation of Scenario 2. However, the average annual fuel savings from Scenario 2 are about $1 million less than would occur under Scenario 1 due to the increased flexibility associated with diesel vehicle utilization afforded to commercial solid waste collection contracts under Scenario 2.

For Scenario 2, Table 3 shows that the nonstore retail sector (NAICS 454), which includes fuel dealers, would have $0.9 million in annual average compliance costs. The incremental compliance costs of nonstore retailers from the accelerated construction of 13 alternative-fuel filling stations comprise approximately seven percent of the total annualized compliance costs.

Table 3
Annual (2010-2025) Incremental Cost (in $Millions)—Scenario 2

Year	Alt-Vehicle Purchase	Fuel Savings	Used Diesel Salvage	Stations	Total
2010	$0.00	$0.00	$0.00	$0.00	$0.00
2011	$8.65	-$2.08	-$0.83	$0.59	$6.33
2012	$11.46	-$2.79	-$0.30	$0.66	$9.04
2013	$14.40	-$3.52	-$0.31	$0.75	$11.32
2014	$17.66	-$4.12	-$0.35	$1.02	$14.20
2015	$19.16	-$4.06	-$0.21	$1.07	$15.96
2016	$20.42	-$4.25	-$0.16	$1.28	$17.29
2017	$21.68	-$4.44	-$0.16	$1.31	$18.39
2018	$22.93	-$4.62	-$0.18	$1.35	$19.47
2019	$24.18	-$4.80	-$0.18	$1.38	$20.58
2020	$27.74	-$5.52	-$0.40	$1.48	$23.31
2021	$22.67	-$4.46	$0.41	$1.34	$19.96
2022	$17.61	-$3.41	$0.41	$1.03	$15.64
2023	$12.54	-$2.35	$0.41	$0.71	$11.31
2024	$7.47	-$1.29	$0.41	$0.39	$6.98
2025	$2.41	-$0.24	$0.41	$0.08	$2.66
Average	$15.69	-$3.25	-$0.06	$0.90	$13.28

*The minus sign (-) indicates savings.

The analysis herein does not analyze the impacts of ability or difficulty in obtaining loans because of the limitation of data and analytical tools.

Compliance cost estimates used by staff to analyze the effects of both scenarios for PAR 1193 are likely greater than the actual compliance costs that would result from rule adoption. The cost of acquiring alternative-fuel vehicles used by staff is based only on the price of new alternative-fuel solid waste collection vehicles. Staff expects the supply of used alternative-fuel solid waste collection vehicles from AQMD requirements established prior to 2003 to provide greater opportunities to satisfy requirements of the proposed amendments with lower-priced used alternative-fuel vehicles in the coming years. An active local market for used alternative-fuel vehicles will likely significantly reduce the cost of acquiring compliant alternative-fuel vehicles and the overall cost of complying with the proposed amendments. Staff also anticipates that some fleets will re-power existing diesel vehicles with an alternative-fuel engine to achieve compliance at a lower cost than a new alternative-fuel vehicle purchase.

TOTAL IMPACTS

The REMI PI+ model (version 1.0.116) is used to assess the total socioeconomic impacts of a policy change. The model links the economic activities in the counties of Los Angeles, Orange, Riverside, and San Bernardino. The REMI model for each county is comprised of a five block structure that includes (1) output and demand, (2) labor and capital, (3) population and labor force, (4) wages, prices and costs, and (5) market shares. These five blocks are interrelated. Within each county, producers are made up of 165 private non-farm industries, three government sectors, and a farm sector. Trade flows are captured between sectors and borders as well as across 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.

The assessment herein is performed relative to a baseline without the implementation of PAR 1193. Direct effects of the policy change (the proposed amended rule) have to be estimated and used as inputs to the REMI model in order for the model to assess secondary and induced impacts for all the actors in the four-county economy on an annual basis and across a user-defined horizon (2010 to 2025). Direct effects of PAR 1193 scenarios include additional costs to the affected industries and additional sales of compliance devices (e.g., alt-fuel vehicles) by local vendors at the county (or finer) level and by industry.

The proposed rule would create an additional demand for alternative-fuel solid waste collection vehicles supplied by the wholesale trade sector, which includes commercial and industrial vehicle dealers (NAICS 423). PAR 1193 would also create an additional demand for the nonstore retail sector (NAICS 454), which includes alternative-fuel dealers, due to the expected increase in alternative fuel sales. Under both scenarios alternative-fuel filling station construction acceleration would generate additional demand in the construction sector (NAICS 236), and the machinery manufacturing sector (NAICS 333), which manufactures fuel pumping equipment. The expenditures on vehicles, equipment, and devices, would also add to the cost of doing business for the waste management and remediation services sector (NAICS 562) and nonstore retail sector (NAICS 454).

Employment Impact by Industry

The job impacts of Scenarios 1 and 2 would be similar. The job impacts of Scenario 2 are smaller with 23 fewer jobs forgone on an annual average basis compared with Scenario 1. For Scenario 1, overall 195 jobs could be forgone annually, on average, between 2010 and 2025 in the local economy. Under the baseline forecast, the four-county region will average 10 million jobs annually from 2010 to 2025. The forecast of 195 jobs forgone represents 0.00195 percent of total jobs in the four county region. For Scenario 2, overall 172 jobs could be forgone annually, on average, between 2010 and 2025 in the local economy. Under the baseline forecast, the four-county region will average 10 million jobs annually from 2010 to 2025. The forecast of 195 jobs forgone represents 0.00172 percent of total jobs in the four county region.

However, Scenario 2 in 2011 has more job gains than Scenario 1 due to the immediate impact of alternative-fuel vehicle purchase requirements for new and renewed residential solid waste collection service contracts, which increases demand in the wholesale trade sector (NAICS 423).

The job gains from Scenario 1 exceed those of Scenario 2 by a similar amount—about 1,000 jobs—in 2012 due to increasing alternative-fuel vehicle purchase requirements under Scenario 1.

Tables 4 and 5 present the estimated job impacts by industry for Scenarios 1 and 2, respectively. Job gains in the near term are mainly caused by the expenditure on accelerated purchase of alternative-fuel vehicles as required by both scenarios, and additional income from the sale of used diesel vehicles. As the annualized cost of doing business reaches its full effect and the positive impact of increased spending on alternative fuel vehicle purchases and filling station construction lessens, jobs forgone are expected to begin in 2015 for both scenarios. Jobs forgone in future years are associated with avoided alternative-fuel vehicle purchases that are required under the existing rule, but would not be needed under both scenarios, and the additional cost of doing business from the accelerated purchase of alternative-fuel vehicles. On average, the retail trade sector (NAICS 454), which includes fuel dealers, experiences the largest jobs forgone—42 jobs under Scenario 1 and 35 jobs under Scenario 2—due to the accelerated schedule of alternative fuel station construction and decreased expenditures on fuel. In addition, this sector also absorbs indirect impacts from fluctuations in other sectors.

Table 4
Job Impact of Scenario 1 by Sector by Selected Year

Industry	2011	2012	2013	2015	2016	2021	2025	**Average Annual**
Construction	18	62	51	-11	-26	-58	-43	**-18**
Wholesale trade	100	450	312	7	6	-167	-132	**23**
Retail trade	20	79	26	-63	-65	-100	-53	**-42**
Truck transportation	3	15	9	-4	-5	-13	-9	**-3**
Monetary authorities	6	25	14	-8	-8	-18	-9	**-4**
Securities, commodity contracts, investments	5	20	10	-7	-7	-14	-5	**-3**
Real estate	8	36	19	-14	-16	-40	-27	**-13**
Professional and technical services	20	89	59	-17	-21	-77	-58	**-17**
Management of companies and enterprises	4	16	10	-3	-3	-11	-7	**-2**
Administrative and support services	25	110	72	-17	-20	-79	-59	**-14**
Waste management and remediation services	1	1	-7	-24	-28	-43	-26	**-25**
Ambulatory health care services	12	52	28	-18	-17	-39	-20	**-9**
Food services and drinking places	8	36	24	-5	-7	-30	-26	**-7**
Personal and laundry services	5	21	10	-8	-8	-17	-8	**-4**
Private households	4	18	9	-6	-5	-11	-5	**-2**
Government	28	121	80	-16	-22	-84	-64	**-16**
Other Private	40	158	97	-45	-53	-136	-100	**-38**
Total Private Industry	**308**	**1307**	**824**	**-259**	**-306**	**-936**	**-651**	**-195**

The sum of individual numbers may not be the same as the total due to rounding.

Table 5
Job Impact of Scenario 2 by Sector by Selected Year

Industry	2011	2012	2013	2015	2016	2021	2025	**Average Annual**
Construction	80	23	14	-6	0	-51	-53	**-16**
Wholesale trade	405	122	122	62	39	-167	-132	**21**
Retail trade	82	-1	-8	-36	-39	-96	-52	**-35**
Truck transportation	14	3	2	-1	-2	-13	-9	**-3**
Monetary authorities	25	4	3	-2	-3	-18	-10	**-4**
Securities, commodity contracts, investments	19	2	2	-3	-3	-14	-6	**-3**
Real estate	34	5	4	-7	-9	-39	-28	**-12**
Professional and technical services	82	20	18	-1	-6	-75	-60	**-15**
Management of companies and enterprises	15	3	3	0	-1	-11	-7	**-2**
Administrative and support services	101	24	23	2	-3	-78	-61	**-12**
Waste management and remediation services	2	-5	-9	-18	-22	-40	-26	**-22**
Ambulatory health care services	50	7	6	-6	-8	-41	-22	**-8**
Food services and drinking places	33	9	8	0	-2	-28	-26	**-6**
Personal and laundry services	20	2	2	-3	-4	-17	-9	**-4**
Private households	18	2	2	-2	-2	-12	-10	**-2**
Government	115	29	26	2	-4	-80	-65	**-15**
Other Private	170	28	22	-16	-14	-150	-109	**-10**
Total Private Industry	**1265**	**275**	**241**	**-36**	**-83**	**-911**	**-685**	**-172**

The sum of individual numbers may not be the same as the total due to rounding.

Competitiveness

The additional cost of Scenarios 1 and 2 may increase the cost of production of the affected industries relative to their national counterparts. Changes in relative production costs would thus be a good indicator of changes in relative competitiveness. The magnitude of the impact depends on the size, diversification, and infrastructure in a local economy, as well as interactions among industries. A large, diversified, and resourceful economy would absorb the impact with relative ease. Implementation of the proposed amendments increases the cost of doing business for affected industries.

Tables 6 and 7 show the impact of Scenarios 1 and 2, respectively, on the cost of production by industry for selected years. An index of 0 indicates that there is no change in the cost of production relative to the rest of the United States. An index of above or below 0 means that the cost of production in the four-county areas resulting from the proposed amendments is higher or lower, respectively, than that in the rest of the U.S.

Under Scenario 1, the waste management and remediation sector would experience an increase in relative cost of production of about 0.04 percent in 2011. The relative cost of production for this sector increases steadily under Scenario 1 until 2020 when the relative cost of production index would be about 0.51 percent. Thereafter, the relative cost of production index for the waste management and remediation sector begins to decline. Scenario 1 would cause a change in the relative cost of production for all other sectors of 0.003 percent or less from 2010 to 2025.

Table 6
Impacts on Relative Cost of Production (Relative to the U.S.)—Scenario 1

Industry	2011	2012	2014	2020	2021	2025
Construction	0.000	0.001	0.002	0.000	0.000	-0.001
Wholesale trade	0.000	0.001	0.001	0.000	0.000	-0.001
Retail trade	0.000	0.002	0.003	0.001	0.001	-0.001
Truck transportation	0.000	0.002	0.002	0.001	0.000	-0.001
Monetary authorities	0.000	0.001	0.002	0.000	0.000	-0.001
Securities, commodity contracts, investments	0.000	0.001	0.002	0.000	-0.001	-0.001
Real estate	0.000	0.002	0.003	0.001	0.000	-0.002
Professional and technical services	0.000	0.001	0.002	0.000	0.000	-0.001
Administrative and support services	0.000	0.001	0.002	0.000	0.000	-0.001
Waste management and remediation services	0.042	0.248	0.499	0.507	0.405	0.030
Ambulatory health care services	0.000	0.001	0.002	0.000	0.000	-0.001
Food services and drinking places	0.000	0.001	0.002	0.000	0.000	-0.001
Repair and maintenance	0.000	0.001	0.002	0.000	0.000	-0.001
Personal and laundry services	0.000	0.002	0.003	0.001	0.000	-0.001
Private households	0.000	0.001	0.001	-0.001	-0.001	-0.001

Under Scenario 2, the waste management and remediation sector would experience an increase in relative cost of production of about 0.18 percent in 2011. The relative cost of production for this sector increases steadily under Scenario 2 until 2020 when the relative cost of production would be about 0.52 percent higher than under the existing rule. Thereafter, the relative cost of production index for the waste management and remediation sector begins to decline. Scenario 2 would cause a change in the relative cost of production for all other sectors of 0.002 percent or less from 2010 to 2025. Both scenarios modestly decrease the relative cost of production by about 0.001 percent in most sectors after 2021.

Table 7
Impacts on Relative Cost of Production (Relative to the U.S.)—Scenario 2

Industry	2011	2012	2014	2020	2021	2025
Construction	0.001	0.001	0.001	0.001	0.000	-0.001
Wholesale trade	0.001	0.001	0.001	0.000	0.000	-0.001
Retail trade	0.001	0.002	0.002	0.001	0.001	-0.001
Truck transportation	0.001	0.002	0.002	0.001	0.001	-0.001
Monetary authorities	0.001	0.001	0.001	0.000	0.000	-0.001
Securities, commodity contracts, investments	0.001	0.001	0.001	0.000	0.000	-0.001
Real estate	0.001	0.002	0.002	0.001	0.001	-0.002
Professional and technical services	0.001	0.001	0.001	0.000	0.000	-0.001
Administrative and support services	0.001	0.001	0.001	0.000	0.000	-0.001
Waste management and remediation services	0.183	0.236	0.353	0.519	0.419	0.048
Ambulatory health care services	0.001	0.001	0.001	0.000	0.000	-0.001
Food services and drinking places	0.001	0.001	0.001	0.001	0.000	-0.001
Repair and maintenance	0.001	0.002	0.001	0.001	0.000	-0.001
Personal and laundry services	0.001	0.002	0.002	0.001	0.001	-0.001
Private households	0.001	0.001	0.001	0.000	-0.001	-0.001

Changes in production costs will affect prices of goods produced locally and imported elsewhere. Based on the measurement of relative delivered prices in the REMI model, Scenarios 1 and 2 are projected to result in higher delivered prices. These impacts are smaller than those on the relative cost of production (Tables 6 and 7).

Tables 8 and 9 show the impact of Scenarios 1 and 2, respectively, on the delivered price by industry for goods produced locally. The relative delivered price of a good is based on its production cost and the transportation cost of delivering the good to where it is consumed or used. The average price of a good at the place of use reflects prices of the good produced locally and imported elsewhere.

Under Scenario 1, the waste management and remediation sector would experience an increase in delivered price of about 0.03 percent in 2011. The delivered price for this sector increases steadily under Scenario 1 until 2020 when the delivered price would be about 0.4 percent higher than under the existing rule. Thereafter, the increase in delivered price for the waste management and remediation sector begins to decline. Scenario 1 would cause a change in delivered price for all other sectors of 0.003 percent or less.

Table 8
Impacts on Relative Delivered Price (Relative to the U.S.)—Scenario 1

Industry	2011	2012	2014	2020	2021	2025
Construction	0.000	0.001	0.002	0.000	0.000	-0.001
Wholesale trade	0.000	0.001	0.001	0.000	0.000	-0.001
Retail trade	0.000	0.002	0.003	0.001	0.000	-0.001
Truck transportation	0.000	0.001	0.002	0.001	0.000	-0.001
Monetary authorities	0.000	0.001	0.002	0.000	0.000	-0.001
Securities, commodity contracts, investments	0.000	0.001	0.001	0.000	0.000	-0.001
Real estate	0.000	0.002	0.003	0.001	0.000	-0.002
Professional and technical services	0.000	0.001	0.002	0.000	0.000	-0.001
Administrative and support services	0.000	0.001	0.002	0.000	0.000	-0.001
Waste management and remediation services	0.033	0.196	0.394	0.400	0.321	0.025
Ambulatory health care services	0.000	0.001	0.001	0.000	0.000	-0.001
Food services and drinking places	0.000	0.001	0.002	0.000	0.000	-0.001
Repair and maintenance	0.000	0.001	0.002	0.000	0.000	-0.001
Personal and laundry services	0.000	0.002	0.003	0.001	0.000	-0.001
Private households	0.000	0.001	0.001	-0.001	-0.001	-0.001

Under Scenario 2, the waste management and remediation sector would experience an increase in delivered price of about 0.14 percent in 2011. The delivered price for this sector increases steadily under Scenario 2 until 2020 when the delivered price would be about 0.41 percent higher than under the existing rule. Thereafter, the increase in delivered price for the waste management and remediation sector begins to decline. Scenario 2 would cause a change in delivered price for all other sectors of 0.002 percent or less. Both scenarios modestly decrease the delivered price by about 0.001 percent in most sectors after 2021.

Table 9
Impacts on Relative Delivered Price (Relative to the U.S.)—Scenario 2

Industry	2011	2012	2014	2020	2021	2025
Construction	0.001	0.001	0.001	0.001	0.000	-0.001
Wholesale trade	0.001	0.001	0.001	0.000	0.000	-0.001
Retail trade	0.001	0.002	0.002	0.001	0.001	-0.001
Truck transportation	0.001	0.001	0.001	0.001	0.000	-0.001
Monetary authorities	0.001	0.001	0.001	0.000	0.000	-0.001
Securities, commodity contracts, investments	0.001	0.001	0.001	0.000	0.000	-0.001
Real estate	0.001	0.002	0.002	0.001	0.001	-0.002
Professional and technical services	0.001	0.001	0.001	0.000	0.000	-0.001
Administrative and support services	0.001	0.001	0.001	0.000	0.000	-0.001
Waste management and remediation services	0.144	0.187	0.279	0.410	0.332	0.039
Ambulatory health care services	0.001	0.001	0.001	0.000	0.000	-0.001
Food services and drinking places	0.001	0.001	0.001	0.001	0.000	-0.001
Repair and maintenance	0.001	0.002	0.001	0.001	0.000	-0.001
Personal and laundry services	0.001	0.002	0.002	0.001	0.001	-0.001
Private households	0.001	0.001	0.001	0.000	-0.001	-0.001

Overall, the projected increases in the cost of production and delivered prices indicate that the impact on the regional economy's competitiveness relative to their national counterparts would be small.

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