



Overview of Socioeconomic Analyses for Air District Rulemaking

Board of Directors

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Presentation Outline

- Background on Rule Development Requirements
- Statutory Requirements for Socioeconomic Impacts
- Overview of Socioeconomic Analyses
- Additional Information for Decision Making Processes
 - Health and Equity Assessments
 - Expanded Analysis of Socioeconomic and Economic Impacts

Rule Development Requirements

- Air District develops new rules and rule amendments to be considered by the Board of Directors for adoption
- Number of requirements for evaluating and considering different impacts as part of the rule development process include estimates of:
 - Emission reductions
 - Compliance costs
 - Cost-effectiveness and incremental cost-effectiveness
 - Environmental impacts
 - Socioeconomic impacts

Statutory Requirements

- **California Health and Safety Code, Section 40728.5**
 - “...agency shall, to the extent data are available, perform an assessment of the socioeconomic impacts of the adoption, amendment, or repeal of the rule or regulation.”
 - “The district board shall actively consider the socioeconomic impact of regulations and make a good faith effort to minimize adverse socioeconomic impacts...”

Statutory Requirements (cont.)

- “Socioeconomic impact” means the following:
 - (1) The type of industries or business, including small business, affected by the rule or regulation
 - (2) The impact of the rule or regulation on employment and the economy of the region affected by the adoption of the rule or regulation
 - (3) The range of probable costs, including costs to industry or business, including small business, of the rule or regulation

Statutory Requirements (cont.)

- “Socioeconomic impact” means the following (cont.):
 - (4) The availability and cost-effectiveness of alternatives to the rule or regulation being proposed or amended
 - (5) The emission reduction potential of the rule or regulation
 - (6) The necessity of adopting, amending, or repealing the rule or regulation to attain state and federal ambient air standards

Overview of Socioeconomic Analyses

- Air District performs some of these assessments as part of other analyses and requirements (such as evaluating emission reductions, cost-effectiveness of alternatives, necessity findings)
- Impacts to industries, businesses, and regional employment and economy assessed with support of socioeconomic consultants

Socioeconomic Analysis: Current Process

Identify Industry

- Identify entities impacted by the proposed regulation
- Estimate economic value of these entities to the Bay Area via input-output (I-O) models, such as IMPLAN (Impact Analysis for Planning) and REMI (Regional Economic Models, Inc.)

Identify Costs

- Estimate average cost of device and implementation to comply with regulation (including cost-effective alternatives)

Assess the Impact

- Analyze economic performance of entities
- Estimate emissions reduction and need for regulatory action
- Estimate impact of regulation (i.e., costs) on continued economic performance (i.e., assumptions of profit reduction/loss, jobs losses)

Limitations of Analysis

- Analysis is focused on regional macroeconomic indicators
 - Does not answer more nuanced local/community-level questions
- Socioeconomic analyses are not designed to provide information on changes to consumption patterns resulting from regulation
 - Direct impact is measured currently, but analysis of impacts on changes in consumption patterns resulting from a change to a regulation, i.e., induced impact estimates, are not currently conducted nor required

Limitations of Analysis (cont.)

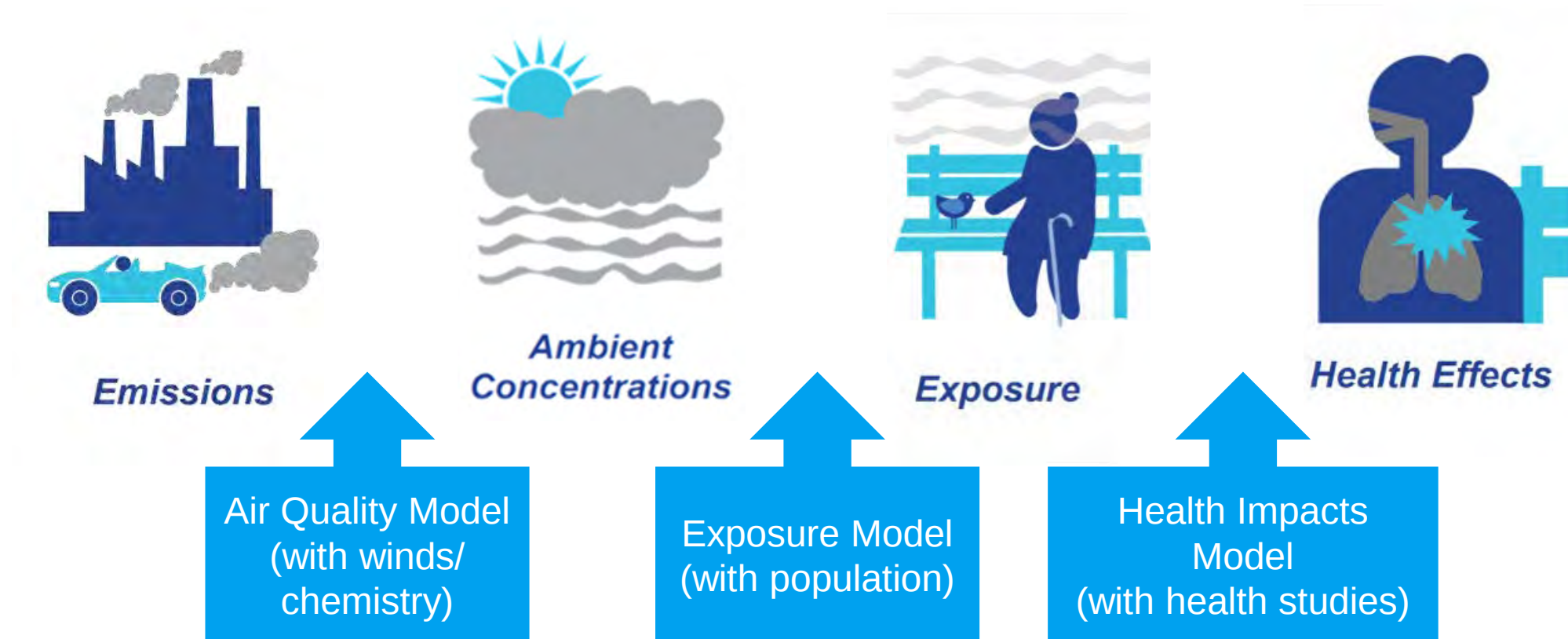
- While some groups have expressed concerns about the adequacy or completeness of the analyses, a precise impact assessment is hard to achieve due to data availability – proprietary business data, such as profit details, relevant cross-sectional data to measure impact on certain specific areas or people groups

Additional Information for Decision Making

- Types of information that are not statutorily required, but can provide supplemental information to the Board and public
 - Modeling-based assessments on health and equity benefits for proposed new rules or amendments
 - Expanded analysis or more detailed assessment of potential socioeconomic and economic impacts

Health and Equity Assessments

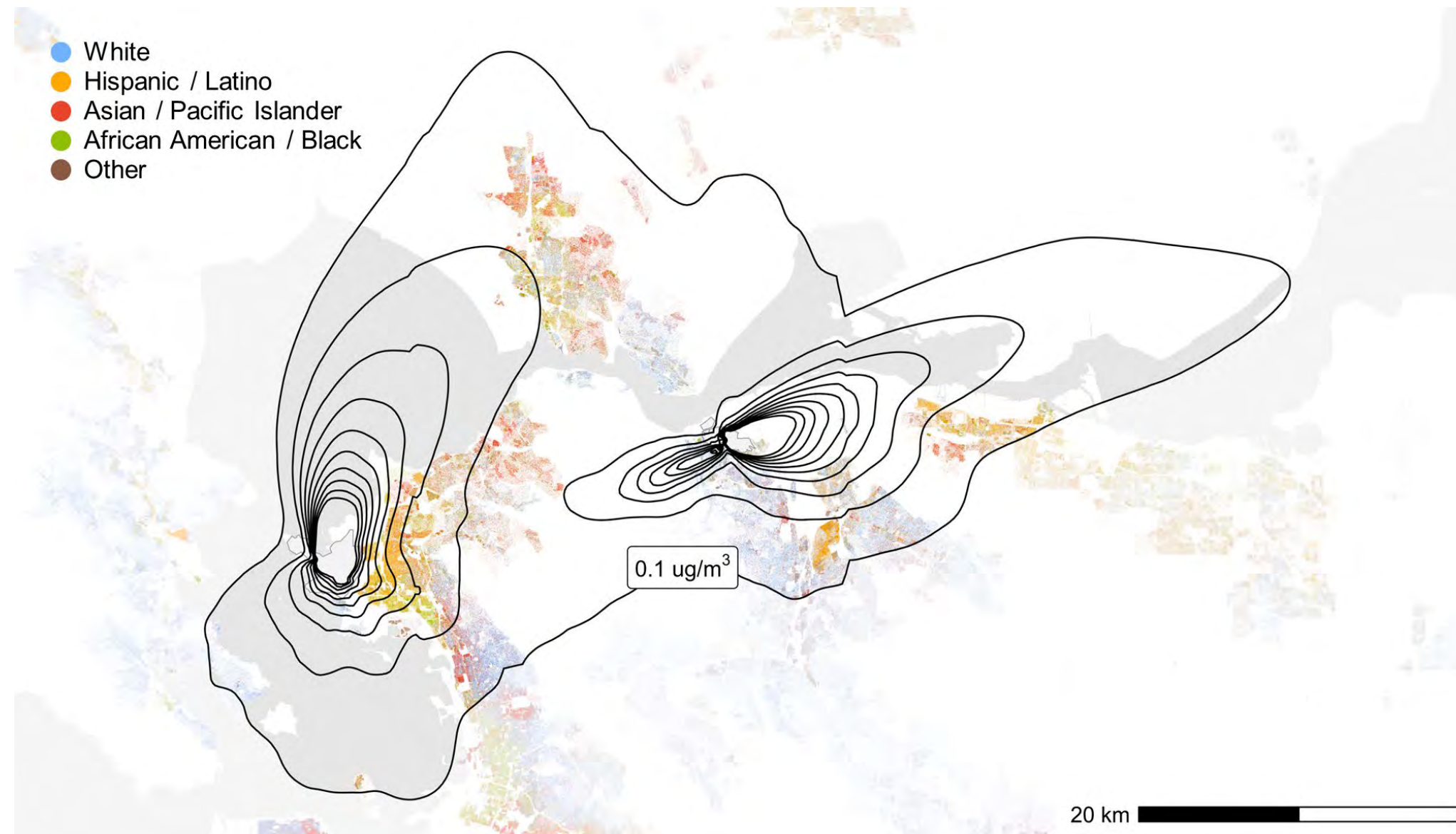
- Modeling can link proposed emission reductions to health impact reductions



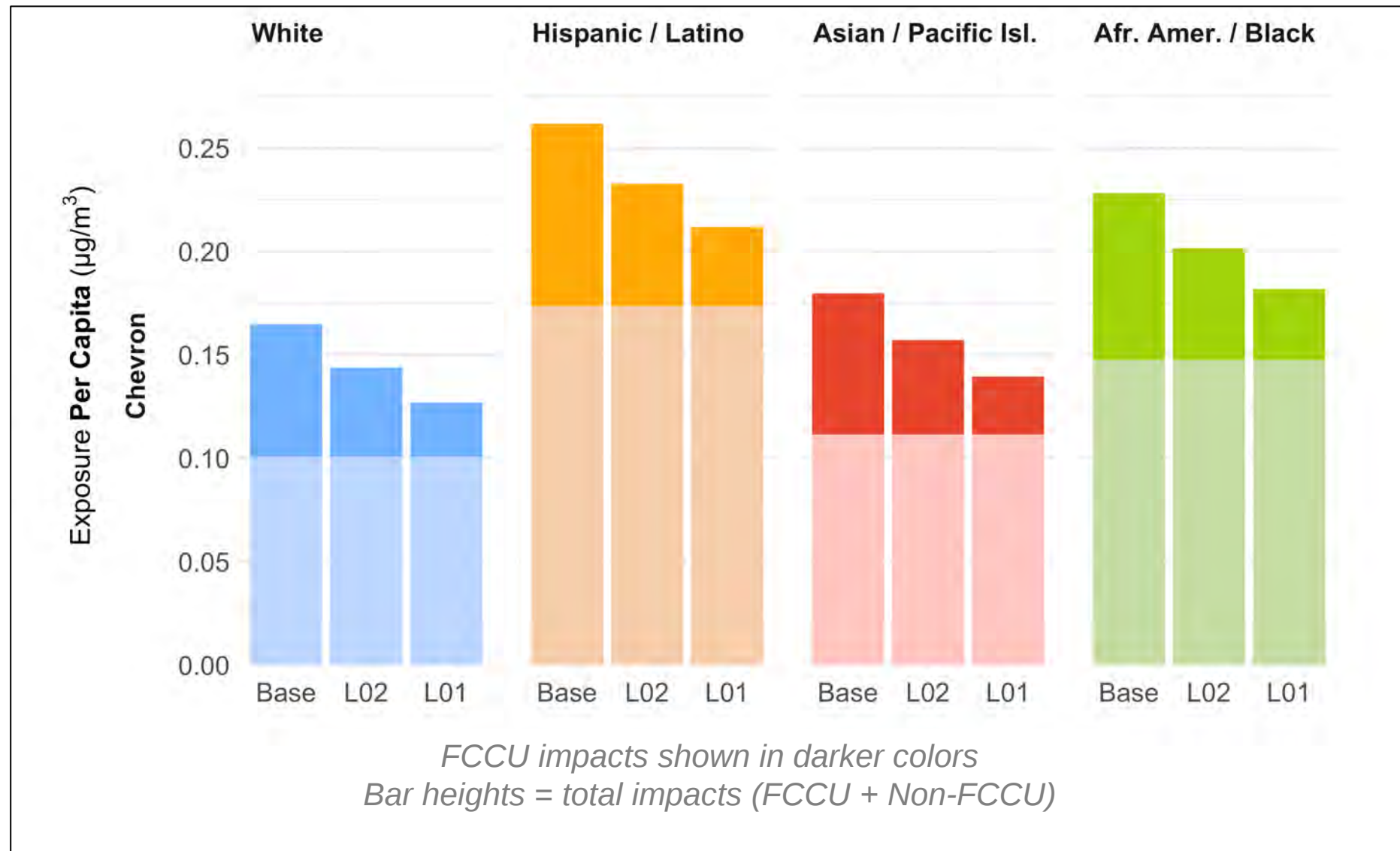
Health and Equity Assessments: Examples

- Examples from past rulemakings:
 - 2021 Amendments to Rule 6-5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs)
 - 2023 Amendments to Rules 9-4 and 9-6: Nitrogen Oxides (NOx) from Natural Gas Space and Water Heaters
- Modeled contributions to annual average particulate matter (PM_{2.5}) at 1 kilometer scale
- Evaluated corresponding exposure levels and disparities
- Estimated health benefits and valuations from rulemakings

2021 Amendments to Rule 6-5: Refinery FCCUs – Modeled PM_{2.5} Levels & Residential Demographics



2021 Amendments to Rule 6-5: Refinery FCCUs – Exposure Disparities



2021 Amendments to Rule 6-5: Refinery FCCUs – Health Benefits

Modeled Health Endpoints

Premature mortality

Cardiovascular: heart attacks, hospital admissions

Restricted activity days

Work loss days

Asthma: exacerbations, Emergency Room visits, hospital admissions

Respiratory illness: upper/lower tract, bronchitis, chronic lung disease

Expected PM_{2.5} exposure reductions →

Decreased mortality & morbidity →

Overall valuations (\$)

Expanded Socioeconomic Impact Analysis

- Often beyond statutory requirement, but can provide additional information for the Board and public
- Additional analysis relevant or appropriate often specific to project of interest and dependent on data availability:
 - Pass down of compliance costs from industry to consumers
 - Special impacts to small businesses
 - Cumulative regional economic impact, location, and market structure of the affected industries
 - Incremental impacts of potential alternative control options

Expanded Socioeconomic Impact Analysis: Example

- **2023 Amendments to Rules 9-4 and 9-6: NOx from Natural Gas Space and Water Heaters**
 - Direct cost impacts on residential consumers
 - Household level impacts – Income groups, housing tenure, poverty level
 - Shifts in consumer spending and potential job losses (direct and indirect/induced)
 - Potential costs of related infrastructure upgrades

Expanded Socioeconomic Impact Analysis: Example (cont.)

- **2025 Amendments to Rule 6-3 and Regulation 5 (Woodburning)**
 - Industry impacts and direct cost impacts on residential consumers
 - Household level impacts – Income groups, poverty level
 - Shifts in consumer spending and potential job losses (direct and indirect/induced)

Expanded Socioeconomic Impact Analysis: Potential Future Work

- Evaluating and expand vendor capabilities as needed:
 - Air District selected vendors in 2023 from a Request For Proposals (RFP) solicitation process with capabilities for additional/expanded analysis (given appropriate data is available for analysis)
 - Evaluate the need for potential expansion of capabilities in the future (Request For Qualifications (RFQs), RFPs, etc.)

Expanded Socioeconomic Impact Analysis: Potential Future Work (cont.)

- Expanding analysis when appropriate and feasible for specific projects
- Amendments to Regulation 3: Fees
 - Socioeconomic analysis not required for these amendments under California Health and Safety Code, Section 40728.5
 - Additional information on impacts to industries/businesses
- Other future rulemaking projects with potential impacts:
 - Broad and widespread impacts
 - Direct small business and/or household impacts
 - Data availability to support level of analysis

Recent Comments and Discussion

- Presented at Stationary Source Committee (SSC) on November 12, 2025
- Committee members and public commenters:
 - Impacts on consumers
 - Equity impacts
 - Understand caveats/limitations and additional resources/time
 - Due diligence on impacts for informed decision making on costs and benefits
 - Air District policy to set expectations

Next Steps

- Continued discussions with stakeholders
- Assess the need for an Air District policy
- Study best practices on socioeconomic analysis within regulatory environment
- Committed to regular updates and discussion at SSC meetings

Questions & Discussion

For more information:

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