# Evaluating the Air Quality Implications of Alternative Energy Futures Using EPA's § 812 Benefit-Cost Methodology

NREL Conference -- Denver

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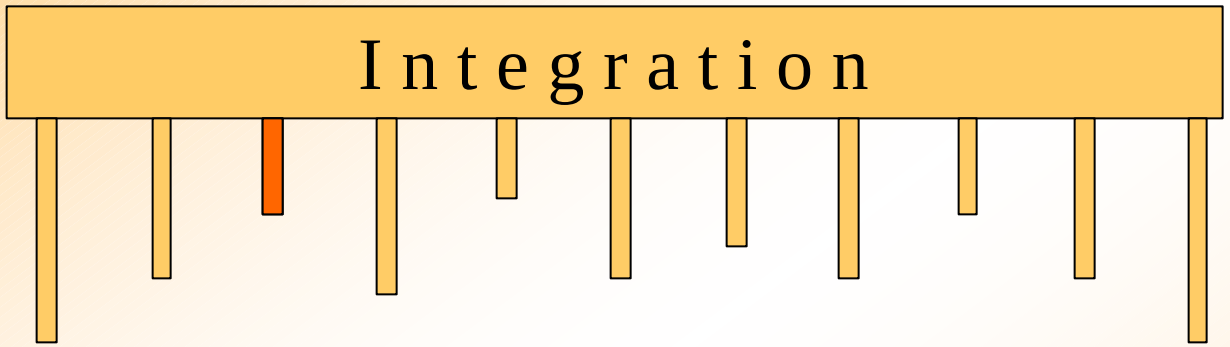
Integration

Expertise


Integration

# Purpose and Scope of Presentation

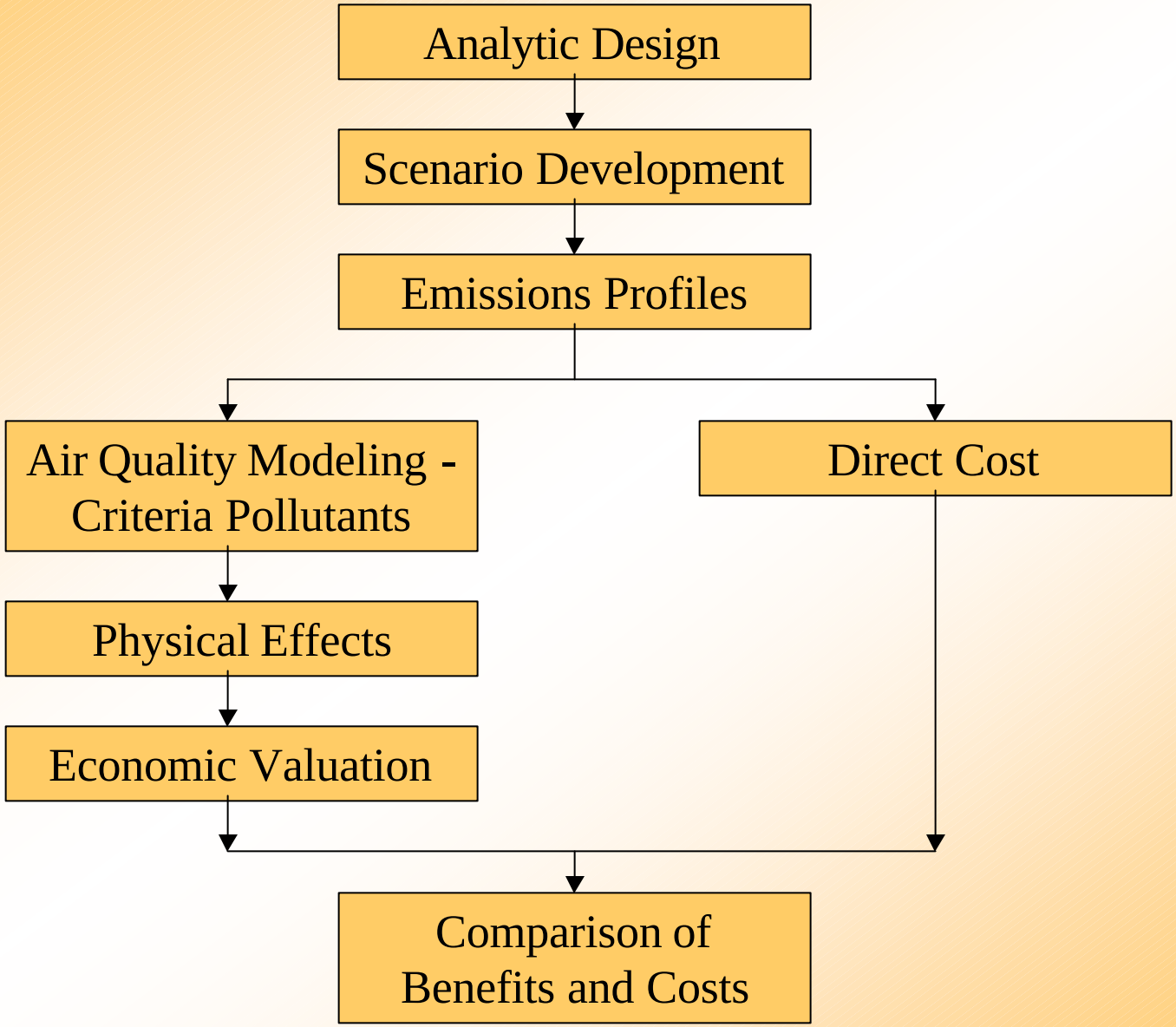
- Background on previous section 812 studies, methods, and results
- Plans for upcoming third study in series
- Opportunities for evaluation of alternative energy futures using section 812 study framework

# Clean Air Act Amendments § 812 Statutory Requirements

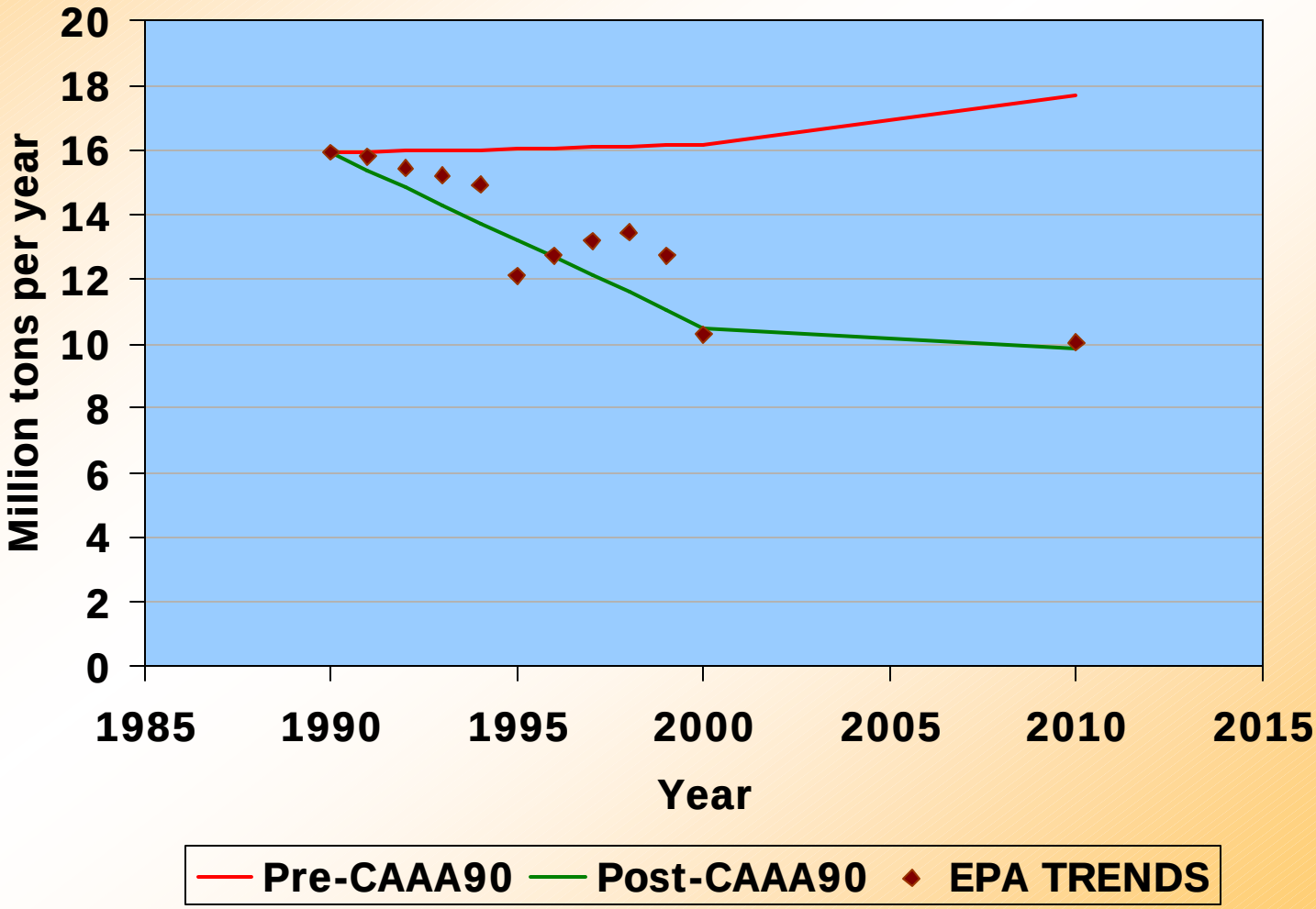
- "(a)…The Administrator shall conduct a comprehensive analysis of this Act on the public health, economy, and environment…
- "(f)…The Administrator shall appoint an Advisory Council… [consisting of] recognized experts in… health and environmental effects of air pollution, economic analysis, environmental sciences, and other [appropriate] fields."
- "(g)…The Council shall review… the data… the methodology… and the findings of such report, and make recommendations to the Administrator concerning the validity and utility of such findings."

# §812 Major Analytical Goals

- Support CAA re-authorization and related legislation
- Complement rulemaking analyses by capturing program interactions
- Improve analytical methodologies for future 812 and other analyses
- Identify program and research priorities


Analytic Design
Scenario Development
Emissions Profiles
Air Quality Modeling - Criteria Pollutants
Direct Cost
Physical Effects
Economic Valuation
Comparison of Benefits and Costs

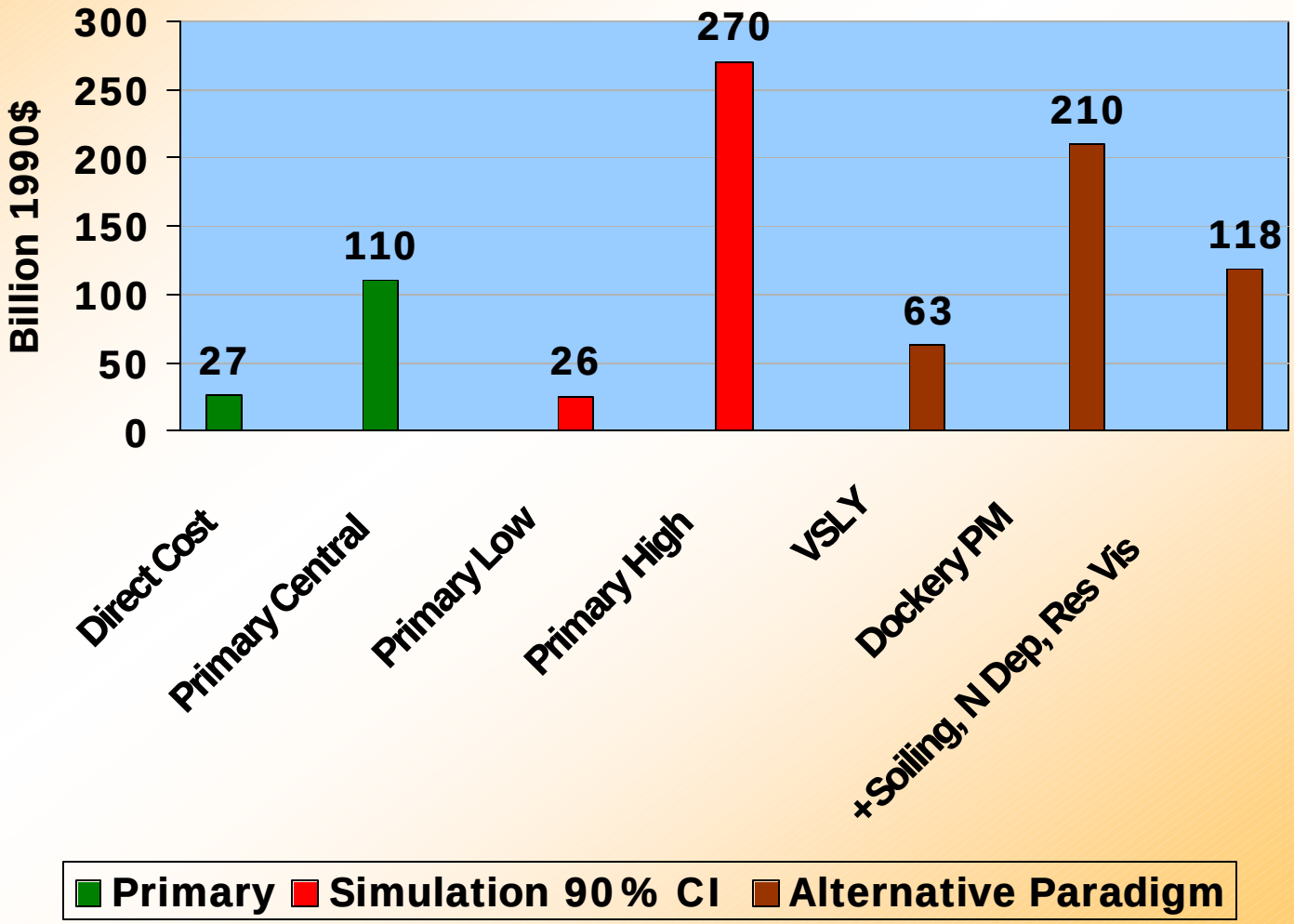
# 812 Prospective I Utility SO2 Emissions



# 812 Prospective I Health Effect
# 2010 Title I - V Incidence Reductions

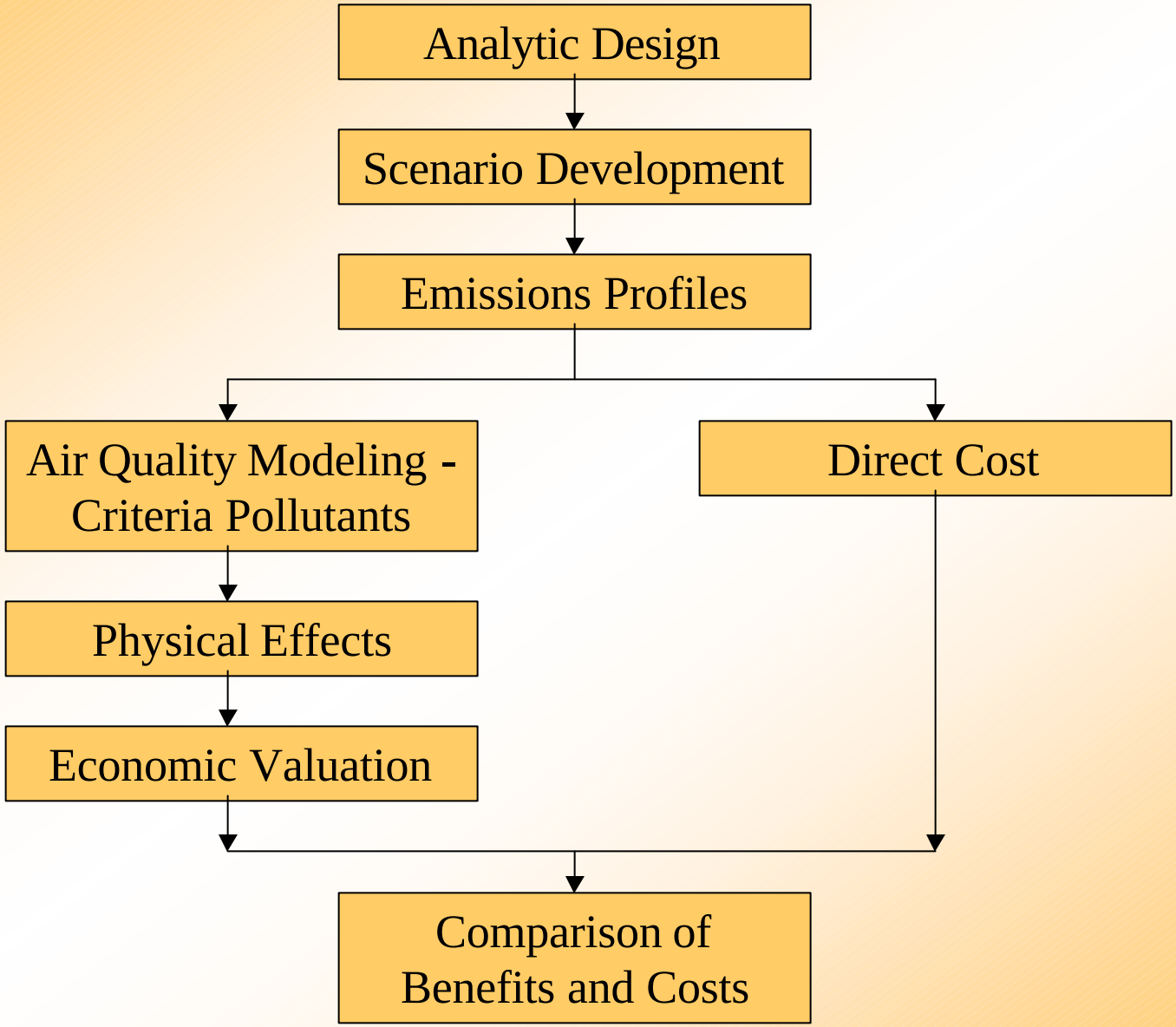
| *Endpoint* | *5th %* | *Mean* | *95th %* |
|---|---|---|---|
| Mortality (30+) | 14,000 | 23,000 | 32,000 |
| Chronic Bronchitis | 5,000 | 20,000 | 34,000 |
| Chronic Asthma | 1,800 | 7,200 | 12,000 |
| Cardiopulmonary Hospitalization | 23,000 | 64,000 | 134,000 |
| Asthma ERVs | 430 | 4,800 | 14,000 |
| Minor Illnesses | Millions | Millions | Millions |
| Restricted Activity Days | 10,000,000 | 12,000,000 | 13,000,000 |
| Work Loss Days | 3,600,000 | 4,100,000 | 4,600,000 |

# 812 Prospective I 2010 Title I - V Benefits and Costs



# Key Scope Changes for 812 III

- Update and expansion/extension of first prospective
- 1990 to 2020 reference period
- Increased disaggregation of results: by emitting sector
- Supplemental reduction cases: utilities, on-highway, both
- HAP benefit case study (probably benzene)
- Ecological benefit case study (ozone or nitrogen?)
- Updated benefits of Title VI
- General equilibrium modeling
- Alternative energy baseline?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<u>Supplemental Analyses</u>:

HAP case study

Eco case study

Supplemental reduction cases

Title VI reanalysis

CGE modeling

Alternative energy baseline?

# Opportunities for Energy Sector Analysis

- Alternative energy baselines
- Supplemental reduction scenarios
  - Utilities
  - Highway Vehicles
  - Both
- Sensitivity analysis to evaluate air quality implications of alternative energy futures:
  - Changes in fuel use
  - Changes in prices
  - Changes in emissions factors
- Expected outcome = any energy program or policy which reduces ambient fine particulate matter will likely show substantial economic benefits using current methods

# Conclusion

- 812 studies are ongoing
- Analytical system is state of the art
  - Best available data, models and methodologies
  - Talented and experienced team of analysts
  - Rigorous external peer review by dedicated SAB panel
- Opportunities available to evaluate air quality implications of different energy futures
  - Emissions
  - Air quality
  - Human health and (limited) ecological consequences
  - Economic costs and benefits
- *www.epa.gov/oar/sect812*