

# **EAAC Economic Modeling Subcommittee**

**August 13, 2009**

**San Francisco**

# Committee Members

- **Subcommittee**
  - **Jim Bushnell (Chair)**
  - **Larry Goulder**
  - **Chris Knittel**
  - **Steve Levy**
  - **Nancy Ryan**
  - **Nancy Sidhu**
  - **Jim Sweeney**
  - **Matthew Barger (secondary)**
- **ARB Staff Members**
  - **Mark Wenzel**
  - **Matt Zaragoza**

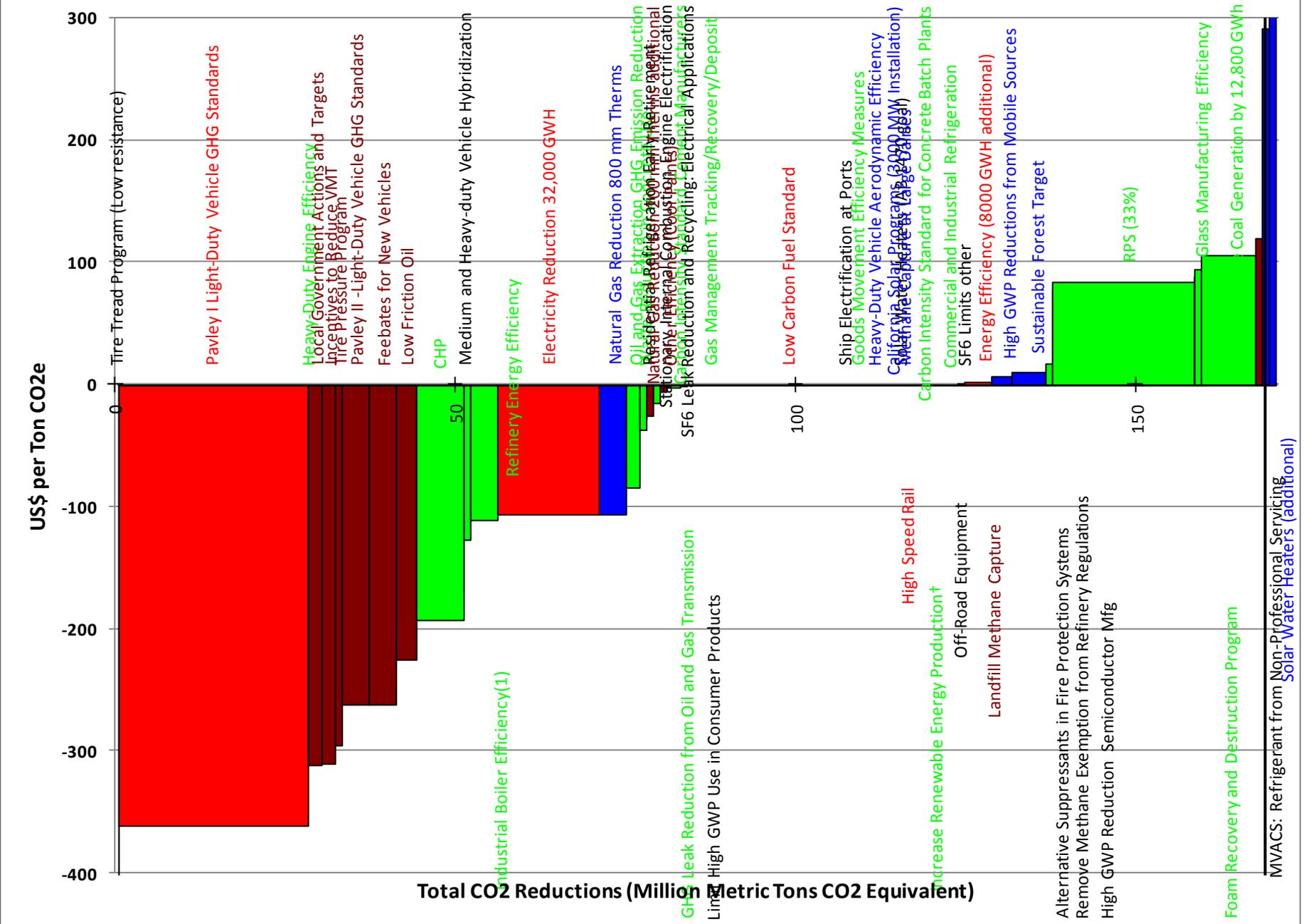
# Issues to be Addressed

- **Inputs to State-wide Economic Models**
  - Assumptions re regulatory changes
  - Analysis of quantity and cost impacts of direct interventions
    - Including co-benefits and co-costs
- **Models of Economic Impacts of Programs**
  - Choice of Models
  - Representation of combined regulatory changes and carbon limitations in Models
- **Interpretation of Results**
  - Overall Package

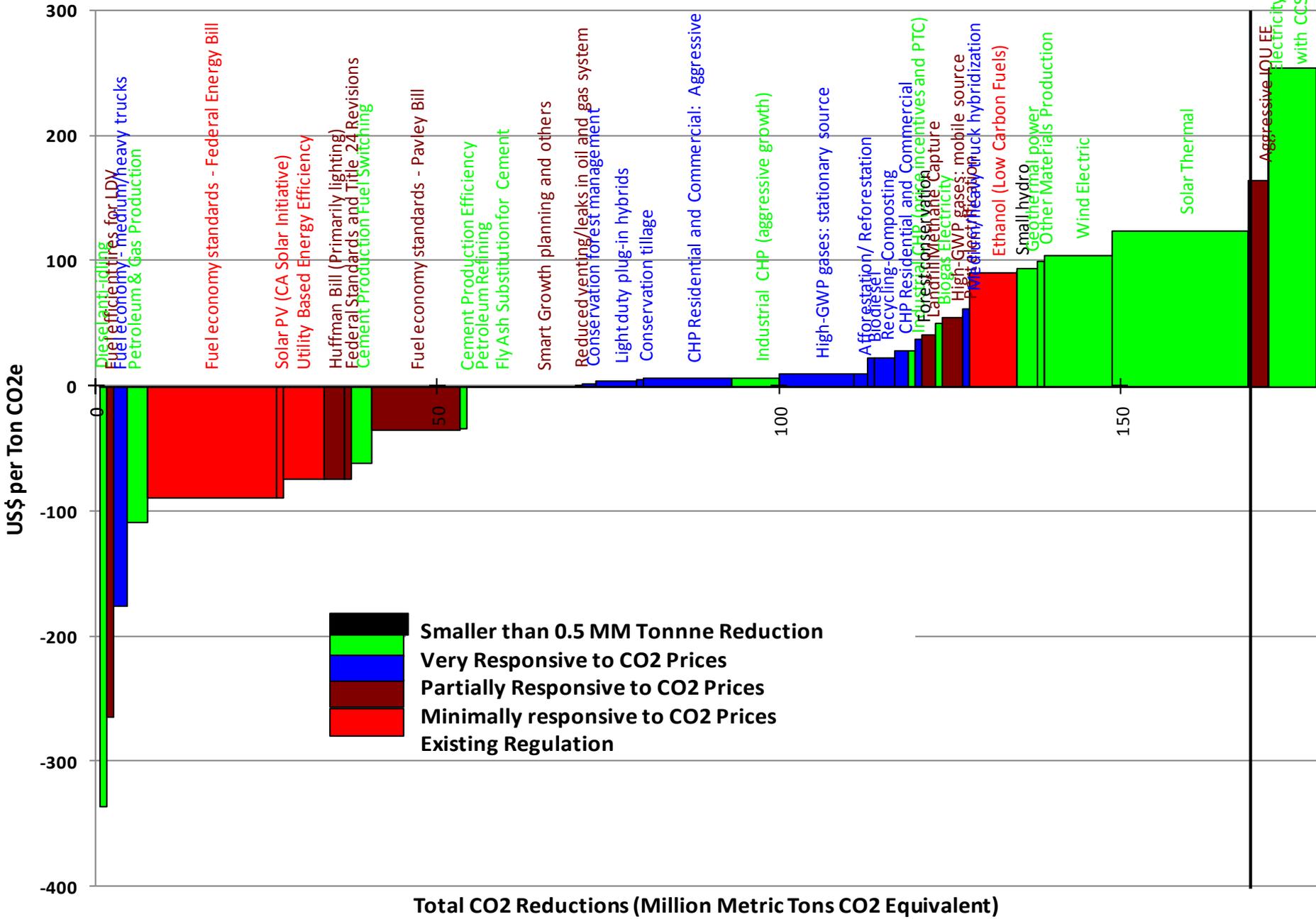
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# Scoping Plan Marginal Abatement Cost Estimates (From Appendix)



# Alternative Estimates (From Stanford Project)



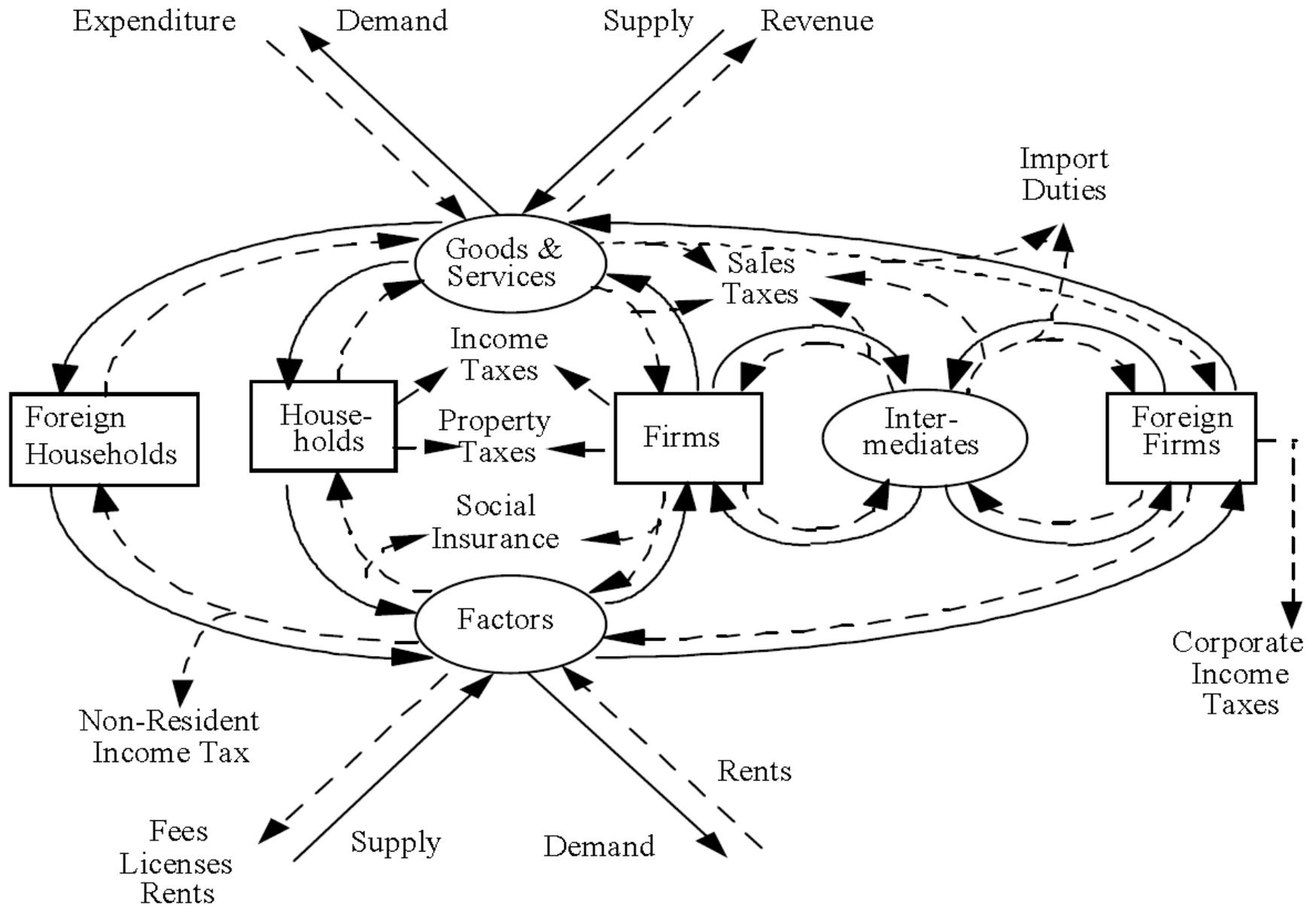
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# **Choice of Overall Model: E-DRAM**

- **Environmental Version of Dynamic Revenue Allocation Model**
- **Original model developed by Professor Peter Berck (Department of Agricultural and Resource Economics and Policy; University of California, Berkeley)**
- **Model developed in the mid 1990s to argue case that tax cuts raise revenues in a “dynamic revenue” context**

# Environmental Dynamic Revenue Allocation Model (E-DRAM)



# Questions on E-DRAM

- **Is this model appropriate for the assessment being undertaken?**
  - **Was E-DRAM model designed for this kind of work?**
  - **Is the structure appropriate ?**
  - **Are parameters consistent with best evidence?**
- **What are BAU economic and demographic inputs?**
  - **The E-DRAM model does not include an economic forecasting component and so economic and demographic BAU inputs were exogenous.**
  - **Are BAU economic and demographic inputs and forecasts consistent with the main-stream assumptions?**

# Choice of Overall Model

- **Would another model or models be better for use by ARB?**
- **Can models be used in combination?**

# **BAU Input Data Sources**

## **(From Matthew Zaragoza-Watkins)**

- **Economic Output from the U.S. Department of Commerce's Bureau of Economic Analysis Census of Business (2003)**
- **Employment is from CA Employment Development Department.**
- **The BEA data are corrected for energy use based on the California Energy Balances (CALEB) study**
- **Demand is estimated from the Consumer Expenditure Survey for the Western U.S.**
- **State Government data comes from CA state records**
- **Most parameters (e.g., elasticities of substitution) are taken from the literature.**
- **Forecasts of employment and output were "scaled up" from 2003 inputs**

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# Interpretation of Results

- **What economic and environmental impacts are being reported? What impacts should be reported?**
  - **Growth in aggregate economic activity ?**
  - **Aggregate benefits and costs (co-benefits/co-costs) ?**
  - **Greenhouse gases releases ?**
  - **Cap-and-trade net revenues ?**
  - **Non-greenhouse gas environmental impacts ?**
  - **Jobs in California – distribution of jobs ?**
  - **Distribution of economic activity by industry ?**
  - **Distribution of benefits/costs by income class ?**
- **Should impacts be reported for individual initiatives or only for aggregate of all measures ?**