



# **Preliminary Approach to Scenario Modeling**

**Economic Analysis Technical Stakeholder Workgroup  
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# Outline

- Description of Overall Approach
- Establishing a Reference Case
- How the Core Policies will be Modeled
- General Assumptions for the Five Preliminary Scenarios
- Questions

## Overall Approach

- April 17<sup>th</sup> workshop will include a presentation of preliminary results for the following modeling runs:
  - Reference Case
  - Core Policies Run
  - Five Policy Scenarios

# Defining a Reference Case

- Incorporate state policies through 2007.
- Incorporate federal energy policy through the Energy Independence and Security Act of 2007:
  - Updated CAFE standards
  - Increased use of biofuels
  - New building and device efficiency standards
- For the electricity sector:
  - Energy Efficiency included in 2007 CEC Demand Forecast
  - 20% Renewable Portfolio Standard

# The Core Measures

- The following core measures will be included in all scenarios:
  - Greenhouse gas tailpipe emission standards
  - Low carbon fuel standard
  - Other discrete early actions adopted by the Board in 2007
  - Increased energy efficiency beyond current programs
  - Reductions in vehicle miles traveled



## How Core Measures will be Modeled

- Greenhouse gas tailpipe emission standards
  - Increases in light duty vehicle efficiency beyond CAFE requirements.
- Low carbon fuel standard
  - Increased penetration of biofuels.
  - Increased penetration of electric vehicles.

## How Core Measures will be Modeled

- Examples of other (non LCFS) discrete early actions adopted by the Board in 2007
  - Green Ports
    - Modeled as a reduction in diesel use and an increase in electricity use.
  - SmartWay Truck Efficiency
    - Modeled as heavy-duty vehicle efficiency improvements.
- Reductions of high-GWP gases not treated in preliminary work

## How Core Measures will be Modeled

- Increased energy efficiency beyond current programs
  - GWh reduction in demand for electricity
  - BTU reductions for natural gas
- Reductions in vehicle miles traveled
  - Some percentage reduction exogenously determined and included in the model as an input.



# Five Policy Scenarios

1. Additional direct regulations.

Three cap-and-trade scenarios:

2. Coverage of large point sources.

3. Coverage of large point sources with regional trading.

4. Coverage of large point sources, residential & commercial natural gas, and transportation fuels with regional trading.

5. A carbon fee applied to fuels throughout the California economy at the distribution level.

# General Assumptions for Additional Direct Regulation Scenario

- Expanded versions of core policies
  - Example:  $f_U$  further increases in light duty vehicle efficiency
- Measures beyond core policies
  - Primarily modeled as increases in device or process efficiencies outside of core policy coverage.
- Levels of feasible reductions will be established based on input from sector teams

## General Assumptions for All Cap-and-Trade Scenarios

- Assumptions discussed today apply only to the initial modeling efforts.
  - Policy decisions on these issues will require more in-depth analysis in the future
- Sectors outside of the cap are required to make the same amount of reductions as expected in the direct regulation scenario.
- No offsets in preliminary modeling
  - Discussion of how to model offsets April 4<sup>th</sup>.

# General Assumptions for All Cap-and-Trade Scenarios

- Phased in auction
  - 20% in 2012 to 100% in 2020.
  - Plan to return auction revenue directly to consumers in preliminary work.
  - Discussion of distribution of allowance value this issue in the afternoon session.
  - More detailed treatment of this issue in future phases of modeling.
- No banking or borrowing in preliminary modeling
  - Not well suited to evaluation in the model at this time.
  - Discussion of these issues on April 25<sup>th</sup>.



# Setting the Cap for Cap-and-Trade Scenario Runs

- Cap in 2012 = emissions for capped sectors based on historical data.
  - Some level of reductions expected below 2012 reference case.
- Cap in 2020 = overall 1990 target – emission levels expected from sectors outside of the cap in 2020
- The cap will decline linearly between these two points



## General Assumptions for Carbon Fee Scenario

- Applied based on carbon content for all fossil fuels.
- Applied to entities at the distribution level.
- Three levels of economy-wide carbon fee evaluated.
  - 10 \$/tonne
  - 30 \$/tonne
  - 50 \$/tonne

# Questions and Comments?

**E-mail questions to [CCPlan@arb.ca.gov](mailto:CCPlan@arb.ca.gov)**