Cap Setting and Data Review:
Establishing Surrender Obligation
and Examining Historical GHG Data Trends

November 16, 2009
California Air Resources Board
Agenda

• Opening Remarks (15 minutes)
• Staff Presentation (45 minutes)
• Round-Table Discussion (2 hours)
• Other Issues (15 minutes)
• Adjourn
Timeframe for Cap-and-Trade Rulemaking

- **November 2009**: release preliminary draft regulation for public comment
- **Spring 2010**: release complete draft regulation for public comment
- **August 2010**: release staff report and draft regulation for formal 45 day review
- **October 2010**: Board consideration of regulation
- **Late 2011**: First auction of allowances
- **January 1, 2012**: Program formally launches
Today’s Meeting

• Purpose:
  1. Discuss staff thinking on which emissions are covered in the cap-and-trade program
  2. Provide estimates of historical emissions for these covered sources
  3. Present example cap levels

• Stakeholders are asked to provide written comments on these topics to ARB by December 14th.

(http://www.arb.ca.gov/cc/capandtrade/comments.htm)
Outline of Presentation

• Introduction and background
• Which emissions are covered by the cap?
• Examining emissions data trends
• What are appropriate California cap levels?
• Relationship between cap stringency offset limit
• What major outstanding factors might influence cap estimates?
• Current thinking on timeline for development of cap numbers
Important Definitions

- **Covered Entities** – Those that have a ‘surrender obligation’ for greenhouse gas emissions covered by the cap-and-trade program

- **Compliance Instruments** – Either an allowance or an offset credit

- **Surrender Obligation** – The quantity of compliance instruments a covered entity is responsible for submitting to match against a specified set of greenhouse gas emissions

- **Allowance budget** – Annual number of allowances associated with one year (when multiple budgets are summed across time referred to as ‘the cap’)

- **Cap** – The total amount of allowances to be issued in a given time period (sum of multiple budgets)
Covered Entities

• 2012-2014 (Narrow Scope)
  – In-State Electricity Generation Facilities and Imported Electricity
  – Large Stationary Sources

• 2015-2020 (Broad Scope)
  – Addition of ‘upstream’ treatment of fuel combustion where fuel enters into commerce covering:
    • Fuel use at small stationary sources (captures combustion at facilities < 25,000 MT CO$_2$e/year)
    • Residential and commercial fuel use
    • Transportation fuel use

• ARB is seeking additional comment on the possibility of accelerating the inclusion of upstream fuel deliverers to 2012
Establishing Surrender Obligation (1)

• What emissions count toward the surrender obligation for narrow-scope sources exceeding the threshold?

• Possible considerations:
  – Accuracy of specific reporting methodologies
  – Treatment of emissions from biomass combustion
  – Process emissions
  – Imported electricity

• Mandatory reporting regulations provide acceptable quantification methods:
  – Potentially add or exclude some quantification methods as part of C&T regulatory package

• Current staff thinking represented in ‘scope table’ handout
Establishing Surrender Obligation (2)

• What emissions count toward the surrender obligation for broad scope sources?
  – Still considering appropriate points of regulation for fuels
  – New reporting requirements will be developed for fuel deliverers as part of the C&T regulatory package
• Current status of staff thinking represented in ‘scope table’ handout
• Possible Considerations:
  – Approaches for calculating surrender obligation for transportation fuels
  – ‘Netting-out’ fuels sold by fuel deliverers to large point sources with direct surrender obligations
Historical GHG Emission Trends and Scoping Plan BAU Projections

Sources:
ARB Greenhouse Gas Inventory  http://www.arb.ca.gov/cc/inventory/inventory.htm
Revision of Emissions Projections

- Scoping Plan ‘business-as-usual’ emission estimates predated the current economic downturn
- ARB staff is revising projections in conjunction with WCI efforts
- Evaluating external sources of emission projections
  - For example, EIA projects GHG emissions for the Pacific region (see next slide)
Energy Information Administration Data on Total CO₂ Emissions for the Pacific Region (CA, OR, WA, HI, AK)

Sources:
- Energy Information Administration State Carbon Dioxide Emissions (October 2008)
  http://www.eia.doe.gov/oiaf/1605/ggrpt/excel/tbl_statetotal.xls
- Energy Information Administration Annual Energy Outlook 2009 (Updated Reference Case)
  http://www.eia.doe.gov/oiaf/aeo/supplement/supref.html
Update on Western Climate Initiative Coordination

- WCI has contracted with Pechan to assist in projecting ‘best estimates’ of emissions for 2012 and 2015 for all jurisdictions.
  - Will be harmonized with ARB’s efforts

- ARB working as part of the WCI Cap Setting and Allowance Distribution Committee to develop more details of the cap-setting method.
• 2012 allowance budget level (Point A on slide 16) will be established at ARB’s best estimate of expected actual emissions in 2012 for narrow scope sources

• Method of setting rate of decline in first compliance period (sets Point C) still needs to be determined
• 2015 allowance budget level (Point D) will be the sum of the expected actual emissions in 2015 for broad scope emissions and narrow scope budget level (Point C).

• Rate of decline through 2020 based on straight line from 2015 budget (Point D) to 2020 budget (Point E).
Figure Used in Derivation of Example CA Allowance Numbers

- Allowances Issued
- Emissions from All Sources (Period 1)
- Linear Projection to Target (Broad Scope Sources)
- Proportional Projection to % of Target (Narrow Scope Sources)
Historical Emission Trends Relative to Example Allowance Levels

- **Allowances**
- **Broad Scope Historical Emissions**
- **Narrow Scope Historical Emissions**
Current Staff Thinking: Quantitative Offset Limit

- Implement limit as a ‘usage limit’ based on a percentage of an entity’s surrender obligation

- WCI is proposing:
  - Regionally harmonized percentage limit
  - Carry-over mechanism of ‘unused’ limit between compliance periods


Assumptions Embedded in Example California Offset Numbers

- Offsets Allowed = 49% of cumulative reductions from initial cap levels
- Assume that the limit is implemented as a percentage use limit based on entity’s surrender obligation
- Limit calculated is ~4% of total surrender obligation
- Max amount of offsets presented graphically on next slide
  - Distributed using the same percentage over all years (proportional to scope)
Historical Emission Trends Relative to Example Allowance and Offset Levels

- **Offsets**
- **Allowances**
- **Broad Scope Historical Emissions**
- **Narrow Scope Historical Emissions**
Comparison of Example Cap Levels to Scoping Plan BAU and Expected Reductions from Complimentary Policies

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Annual Budget</th>
<th>Average Annual Budget Plus Offsets</th>
<th>Scoping Plan BAU - comp policies for scope</th>
<th>Scoping Plan BAU for scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2014 (narrow scope)</td>
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<tr>
<td>2015-2017 (broad scope)</td>
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<tr>
<td>2018-2020 (broad scope)</td>
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<tr>
<td>Factor to Consider</td>
<td>Estimated Impact of Factor</td>
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<tr>
<td><strong>Emissions Projections</strong> – 2012 and 2015 ‘Best Estimates’</td>
<td>Small-Large Change</td>
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<tr>
<td><strong>Imported Electricity</strong> – Reflecting emissions covered in linked trading programs (WCI)</td>
<td>Large Change (0-12% decrease in broad scope emissions coverage)</td>
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<tr>
<td><strong>Transportation Fuels</strong> – Possible obligation for lifecycle emissions</td>
<td>Medium Change (2-6% increase in broad scope emissions coverage)</td>
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<tr>
<td><strong>Industrial Facilities</strong> – Additional process emissions not captured in inventory</td>
<td>Small Change</td>
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<tr>
<td><strong>Imported Electricity</strong> – Changes due to choice of default emission factor for unspecified electricity</td>
<td>Small Change (0.5-1% change in broad scope emissions assuming no impact of linked programs)</td>
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<td><strong>Thresholds/Coverage</strong> – Other minor adjustments to scope for all sectors not captured in inventory</td>
<td>Small Change</td>
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</table>
Transportation Fuels Coverage in Cap-and-Trade Program

- Direct emissions from electricity generation will be covered by electricity deliverers.
- Direct emissions from in-state production of hydrogen will be covered at the production facility.
- Combustion emissions from CNG/LNG use in transportation will be covered at upstream fuel providers.
- ARB is still considering how to calculate surrender obligation for remaining transportation fuels:
  - Gasoline
  - Diesel
  - Liquid biofuels
Possible Approaches for Calculating Transportation Fuels’ Obligation (1)

• Emissions factors based on the net “carbon content”
  – Gasoline and diesel factors based on direct combustion emissions
  – Liquid biofuel factors would be zero
  – Straightforward, but may over-incentivize those biofuels with high lifecycle emissions

• Emissions factors based on the tailpipe combustion factor
  – Gasoline, diesel, and biofuel factors based on direct combustion emissions
  – Straightforward, but may under-incentivize those biofuels with low lifecycle emissions
Possible Approaches for Calculating Transportation Fuels’ Obligation (2)

- Emission factors based on net “carbon content” plus some portion of fuels’ lifecycle emissions
  - *e.g.*, lifecycle portion could be direct and/or indirect land use emissions
  - Hybrid approach of incorporating some lifecycle price signals, but maintaining simplicity of set emissions factors

- Emission factors based on lifecycle carbon intensity factor (per LCFS)
  - Relative fuel-switching incentives more aligned with each fuel’s total GHG footprint
  - Would need to harmonize with narrow scope sources by netting out portion of LCFS factor that is already capped (*e.g.* in-state refinery emissions)
  - Reporting process may rely on LCFS reporting—requires coordination among GHG Mandatory Reporting Tool, LCFS Reporting Tool, and market platform
Current Expected Timeline of CA and WCI Cap Number Development (1)

• Today
  – Example CA Cap (Example CA Allowance Budgets)
• November 2009
  – Example CA Cap in first draft of CA regulation text
• December 2009
  – Public release of Pechan report for WCI on projections
• February 2010
  – “Preliminary” WCI Allowance Budgets
Current Expected Timeline of CA and WCI Cap Number Development (2)

- **June 2010**
  - “Established” WCI Allowance Budgets Released for Public Comment
- **October 2010**
  - ARB Board Adopts “Established” CA Budgets as part of C&T Rulemaking
- **November 2011**
  - “Final Allowance Budgets”
- **August 2014**
  - “Revised Final Budgets”
- **August 2017**
  - “Revised Final Budgets”

Potential Adjustments After 2010 Board Adoption of Regulation?
Potential Topics for Future Meetings on Cap Setting

• Ongoing Improvements to Cap Numbers
  – In coordination with WCI, establish detailed method for projections of future expected emission levels (2012 and 2015)

• Developing compliance pathway scenarios analysis
  – Coordination with the Economic Analysis Subcommittee of the Economic and Allocation Advisory Committee (EAAC)
Key Questions for Stakeholders

• Comments on example allowance and offset levels?
• What flexibility should ARB have to adjust the number of allowances in the system?
  – Post-regulation adoption?
  – Before the beginning of a compliance period?
  – During compliance periods?
• What is the most appropriate approach for calculating the surrender obligation for fuels?
  – What is the relative importance of fuel-switching incentives, consistency across sectors and end uses, scalability to a broader program, and reporting and administrative complexity?