Cap and Trade Workshop on Refineries and Related Industries

August 13, 2013

California Air Resources Board

Logistical Information

- Slides posted at

  http://www.arb.ca.gov/cc/capandtrade/meetings/meetings.htm

- Email questions to:

  auditorium@calepa.ca.gov

- Comments will be accepted at the above website until August 26th, 5 PM

Purpose

- To discuss the benchmarking approach for the second compliance period and following
  - Will also address true-up changes
- Discuss how related industries will be handled

Outline

- Purpose
- Status Update
- Product Based Benchmarking Principles
- Current Regulation and Options
- True-Up
- Solomon Presentation
- Discussion

Cap and Trade Status Update

- Cap-and-Trade Regulation effective January 1, 2012
- Regulatory Amendments effective September 1, 2012
- Emissions Compliance began January 1, 2013
- Linkage Amendments approved April 19, 2013
- Investment Plan released May 14, 2013
- Additional Amendments and Offset Protocols
  - Anticipated Board consideration Fall 2013

General Product-Based Allocation Equation

- Refineries will receive allocations using the same basic equation used for other sectors
  - A_t = output* B* AF_t * c_t
- Benchmark B is set as
  - 0.9 * (emissions/output) or
  - Best in class if no one refinery meets the above
- One Product – One Benchmark
  - Plan to keep this approach unless data shows need for different approach

Benchmark Treatment of Electricity and Steam

- Carbon cost recovery approach
- Steam consumed on-site included
  - Both produced or purchased from a third-party
- Electricity
  - Generated on-site and consumed: included
  - Generated on-site and sold: excluded
  - Purchased from grid and third party CHP: excluded
    - CPUC proceedings for compensation
- Propose that bottoming cycle cogeneration electricity sales will not be subtracted off to maintain consistency with MRR and CPUC decisions

Current Second Compliance Period Approach

- Carbon Dioxide Weighted Tonne (CWT)
  - Provides a carbon dioxide weighted factor (CWF) for each process unit normalized to the distillation unit
  - Throughput provided by unit and multiplied by CWF
  - Added for total CWT
  - Benchmark based on total emissions and total CWT for refineries
- Benchmark from EU
  - Based on EU data
  - Different stringency level

Option 1: Adjust CWT

- Base allocation on CWT with a few amendments:
  - Modify or add CA specific factors
  - Modify for treatment of electricity and steam
  - Modify stringency
  - Hydrogen included
  - Calcining excluded

Option 2: CWB-Based Allocation with Adjustment

- Base allocation on Complexity Weighted Barrel (WSPA-CWB), with a few amendments:
  - Exclude units not currently in CA or expected in CA
  - Similar process units grouped to keep incentive to use more efficient process
  - Treat steam and electricity consistently with other benchmarks
  - Other factors with no direct product are excluded
    - Adjustment for off-sites
    - Electricity use adjustment
  - Hydrogen included
  - Calcining excluded

Principles for Amending Process Unit Factors for CA CWB

- Group together units which accomplish the same purpose, i.e. have very similar inputs and outputs
  - Maintain incentive to use most efficient technology available
  - Use average of factors for each unit, weighted by CA volumes
  - For example, the “Reformer” unit already averages across distinct technologies
- Keep separate units which have substantially different inputs or outputs
  - Provide appropriate allocation for the production accomplished by different processes
  - For example, atmospheric and vacuum distillation have different output mixes despite both being distillers

Tentative CWB Process Units for Use in CA – Feedback Needed

Coker	Delayed Coker
	Fluid Coker
	Flexicoker
Fluid Catalytic Cracking	Fluid Catalytic Cracking
	Mild Residual FCC
	Other FCC
	Thermal Cracking
Hydrogen Production	Hydrogen Production: Steam-Methane Reforming
	Hydrogen Production: Steam-Naphtha Reforming
	Hydrogen Production: Partial Oxidation

Potential Adjustment of Process Unit Factors

- Most process unit factors are similar under CWT and CWB
- Sulfur is substantially different
  - 140, measured in light tons, under WSPA-CWB
  - 18.6, measured in metric tons, under EU-CWT
- ARB proposes to use sulfur factor based on EU-CWT
  - **Unless there are data available to support this difference**
- Most other units do not show such dramatic differences between WSPA-CWB and EU-CWT factors

Option 3: CWB-Based Allocation without Grouping

- Base allocation on WSPA-CWB, with a few amendments:
  - Exclude units not currently in CA or expected in CA
  - Treat steam and electricity consistently with other benchmarks
  - Other factors with no direct product are excluded
    - Adjustment for off-sites
    - Electricity use adjustment
  - Hydrogen included
  - Calcining excluded
  - Still need explanation for sulfur unit differences

Calcining

- Separate benchmark
- 90% or best-in-class
- Process-based cap decline factors

Hydrogen

- Gaseous Hydrogen included in the CWB or CWT approach
- Liquid hydrogen proposed to have a separate benchmark based on quantity sold

True-Up in Other Sectors

- Product based benchmarks in other sectors receive a true-up in allocation once actual output is available
- Initial allocation is based on data two years prior to the vintage year of the allowance allocation
  - Nov 2012 – allocation for year 2013, based on 2011 verified data
  - Nov 2014 – allocation for year 2015, based on 2013 verified data with a true-up for the difference between 2011 and 2013 product data
- The purpose is to account for what the facility should have gotten if ARB had the information at the time of allocation

Refinery True-Up Proposal

- Adding a true-up for non-EII facilities

$$\text{minimum}\ (O_{X,t-2} * B_R * c_{\ t-2} * AF_{R,t-2},\ AE_X * c_{\ t-2} * AF_{R,t-2}) - A_{x,t-2}$$

- Modifying the EII facility true-up to be consistent with other sectors and the purpose of the true-up (to update for actual information on production)
  - Making the credit and debit equation the same
  - Adding in a sector allocation true-up
    - Considering an alternate possibility of not modifying distribution factor Df – only the sector allocation SA and fraction F

ARB Has Conducted Preliminary Analysis Using the Survey Data

- Equity for smaller refineries
  - Analysis does *not* suggest that smaller refineries and larger refineries systematically would get a different % of the allowances they need
- Considered whether EU process units not in CWB may be worth adding
- CWT v. CWB effect for individual refineries
  - Mostly similar, but some substantial changes; SD= 23% change
  - Still considering which of these are due to data anomalies
- Compared to CWT, some refineries will benefit and some will lose

Additional Analysis

- Correlation(GHG emissions, EU-CWT) = 0.84
- Correlation(GHG emissions, WSPA-CWB) = 0.99

(note these would be slightly different without data problems)

Next Steps

- Comments due by August 26th 5 PM at: http://www.arb.ca.gov/cc/capandtrade/comments.htm
- Board Hearing October 24-25th for both MRR and Cap and Trade
- MRR amendments would need to be in effect Jan. 1, 2014

Contacts

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