



Cap-and-Trade Regulation 2016 Amendments: Public Workshop on Emissions Leakage Potential Studies

May 18, 2016

Workshop Materials and Submitting Comments

- ▣ This presentation is posted:
<http://www.arb.ca.gov/cc/capandtrade/meetings/meetings.htm>
- ▣ The presentation webcast is available:
<http://www.calepa.ca.gov/broadcast/?BDO=1>
- ▣ Informal written comments may be submitted until 5 pm (PDT) on Friday, June 10, 2016, at this site:
<http://www.arb.ca.gov/cc/capandtrade/meetings/meetings.htm>
- ▣ During this workshop, e-mail questions to:
sierrarm@calepa.ca.gov

Agenda

- ARB overview of existing emissions leakage assistance framework
- Researcher presentations & Q&A
 - International emissions leakage potential
Meredith Fowle, University of California, Berkeley
 - Domestic emissions leakage potential
Wayne Gray, Clark University
Joshua Linn and Dick Morgenstern, Resources for the Future
 - Food processors emissions leakage potential
Stephen Hamilton, California Polytechnic University, San Luis Obispo
- ARB Presentation & Q&A
 - New proposed metrics
 - Comparison between existing and new metrics

Reasons for Direct Allocation to Industrial Entities

- Direct allocation is provided to industry primarily to prevent emissions leakage, which is a reduction in GHG emissions within California that is offset by an increase in GHG emissions outside of California.
 - The California Global Warming Solutions Act of 2006 requires ARB to prevent emissions leakage to the extent feasible.
- Direct allocation is also provided in the initial years of the program to help industry adjust to a carbon price. This portion of allocation is called transition assistance, and it is meant to decrease over time.
- As countries put into action commitments from the 2015 Paris Agreement, emissions leakage risk will decrease.

Industrial Allocation: Product-Based Allocation

$$\text{Allocation} = A \times B \times C \times O$$

- A = Assistance factor
Based on leakage risk classification
- B = Benchmark
GHG emissions efficiency benchmark
- C = Cap adjustment factor
Universal declining factor in proportion to overall allowance budget decrease (about 2% per year in first three compliance periods)
- O = Product output (e.g., barrels of crude produced)
Determined based on reported/verified data

Original Leakage Classification Analysis: Determining Assistance Factors

- In initial leakage risk assessment, ARB examined the following programs:
 - European Union's Emission Trading Scheme (EU ETS)
 - American Clean Energy and Security Act of 2009 (ACES)
 - Australia's Carbon Pollution Reduction Scheme (CPRS)
- EU ETS, ACES, and CPRS all used a combination of emissions intensity and trade exposure metrics.



Emissions Intensity

ARB developed the following metric for emissions intensity:

$$\text{Sector's emissions intensity} = \frac{\text{metric tons carbon dioxide equivalent (MT CO}_2\text{e)}}{\text{\$ million value added}^*}$$

Emissions intensity was categorized into four risk levels using natural breaks in the data:

High:	> 5000	MTCO ₂ e/\$M value added
Medium:	4999 to 1000	MTCO ₂ e/\$M value added
Low:	999 to 100	MTCO ₂ e/\$M value added
Very Low:	< 100	MTCO ₂ e/\$M value added

* Value added data from the U.S. Economic Census Bureau

Assessing Trade Exposure

ARB used the following trade exposure equation to measure the sensitivity of a sector to international competition:

$$\text{Sector's trade share} = \frac{\text{imports} + \text{exports}}{\text{shipments} + \text{imports}}^*$$

Trade exposure was categorized into three risk levels using natural breaks in the data:

High:	> 19 %
Medium:	19 to 10%
Low:	< 10%

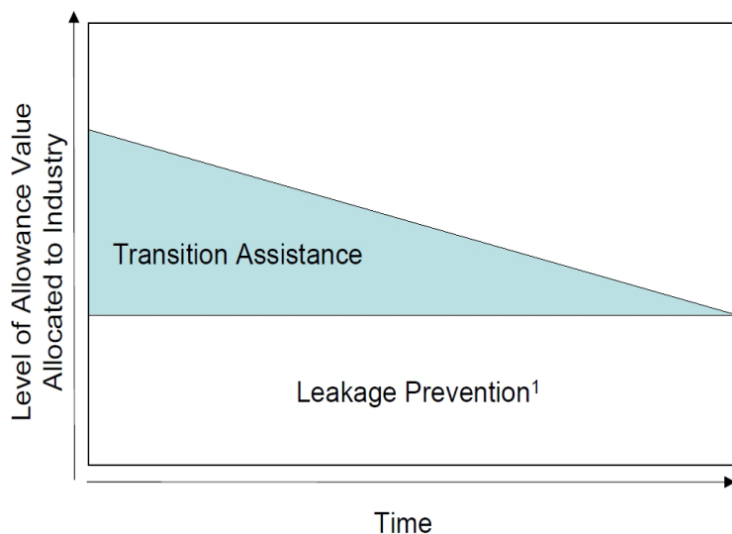
* Imports, exports, and shipments data from the U.S. Census Bureau and the International Trade Commission

Leakage Risk

Leakage Risk	Emissions Intensity	Trade Exposure
High	High	High Medium Low
	Medium	High
Medium	Medium	Medium Low
	Low	High Medium
Low	Low	Low
	Very Low	High Medium Low

Leakage Risk Classification and Allocation

From the leakage risk classification, an industry assistance factor was determined and used as input for product-based and energy-based allocations:



Industry Assistance Factor (A)			
	Compliance Period		
Leakage Risk	1st	2nd	3rd
High	100%	100%	100%
Medium	100%	100%	75%
Low	100%	100%	50%

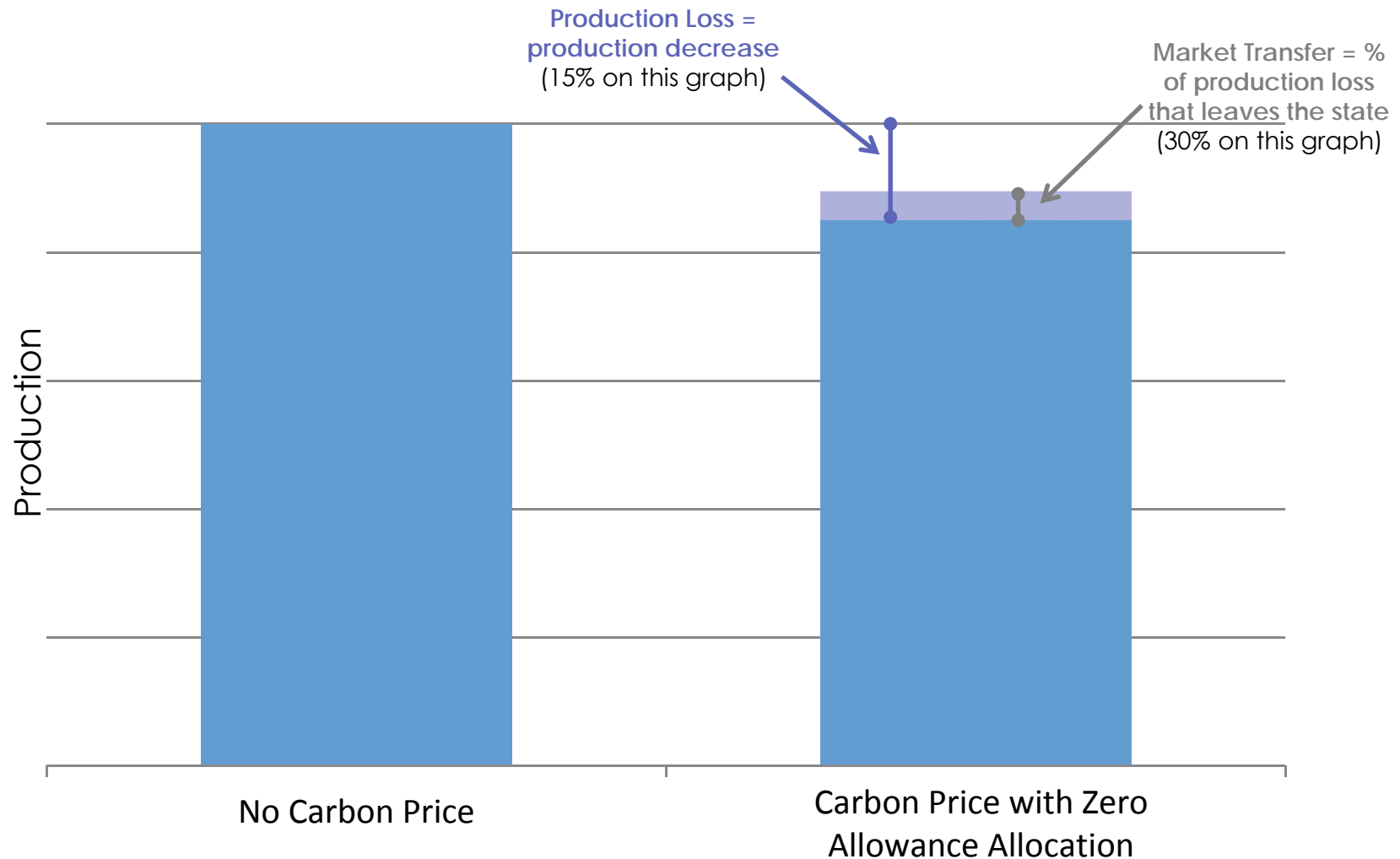
Updates to Leakage Assessment

- In 2011 and 2012, the Air Resources Board directed staff to re-evaluate the initial leakage risk assessment (see Resolutions 11-32 and 12-33).
- In response to this, ARB contracted with three research groups to assess the leakage potential for industries covered by the Cap-and-Trade Program.
 - These studies were completed May 2016.
- These studies will inform staff's proposal for assessing leakage risk and updating assistance factors for allocation starting in the third compliance period (vintage 2018 allowances).

Production Drop and Market Transfer in Context

- ▣ Value Added = value of shipments – cost of purchased inputs and services
 - ▣ Rough estimate of profit
- ▣ Decrease in production *or* production loss = decrease in production in the jurisdiction, either as a total number or a percentage of total
- ▣ Market Transfer = ratio of how much of the reduction in production/value added goes outside the jurisdiction

Placing Definitions in Context: Production Loss and Market Transfer



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