



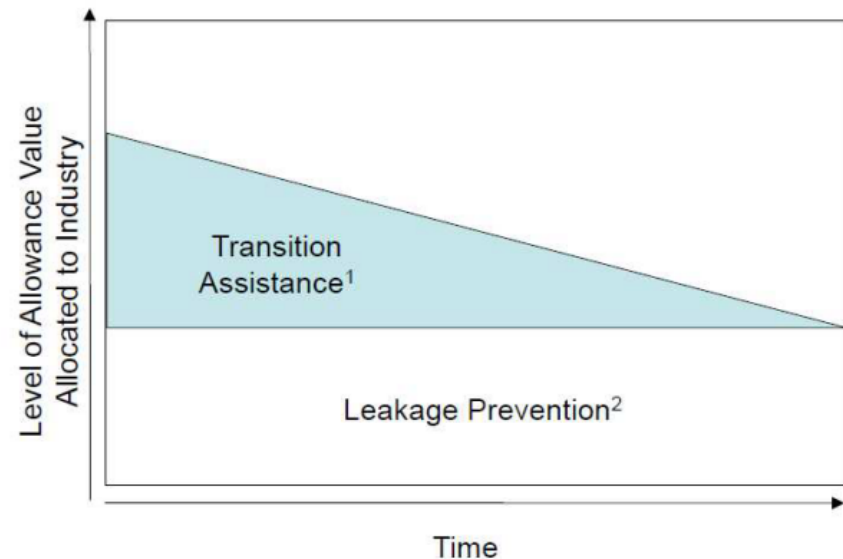
Cap-and-Trade Regulation 2016 Amendments:

Staff Presentation on a Methodological
Framework for Emissions Leakage
Designation for 2018 and Beyond

May 18, 2016

California Industrial Transition Assistance: Historical Perspective

- Direct allocation was provided to minimize emissions leakage to provide transition assistance in the early years of the program; started with 100% assistance factor in 1st compliance period
- 100% assistance factor was extended through the 2nd compliance period as conservative measure
 - Likely exceeds compensation required for emissions leakage protection for most sectors
- Direct allocation only maintained if needed to minimize leakage
- Transition to more auctioning over time



Emissions Leakage Potential and International Climate Agreements

- Emissions leakage potential decreases when economic trading partners implement a carbon price for the same industrial sectors found in California
 - European Union (2005), British Columbia (2008), Northeastern U.S. States (i.e., Regional Greenhouse Gas Initiative, 2009, electricity only), Québec (2014), South Korea (2015), Ontario (2017), State of Washington (2017)
 - China: Pilot programs covering ~20% of 2010 CO₂ (2013 to 2014), proposed national ETS covers some of same industrial sectors found in California (2017)
 - Clean Power Plan (2022)
 - Paris Agreement (2015) – signed by 177 countries

Updated Assistance Factors and Leakage Risk Methodology

- ▣ Product- and energy-based allocation will still be the primary mechanism by which sectors are protected from leakage
 - ▣ Assistance factors will be updated
- ▣ Replacing old metrics with new metrics:
 - ▣ Trade exposure → International market transfer
 - ▣ Emissions intensity → Domestic value-added loss
- ▣ New metrics resemble old metrics, but more precisely measure leakage
- ▣ Most assistance will be given to industrial sectors with the highest levels of emissions leakage

New vs. Old Metrics: Trade Exposure and Int'l Market Transfer

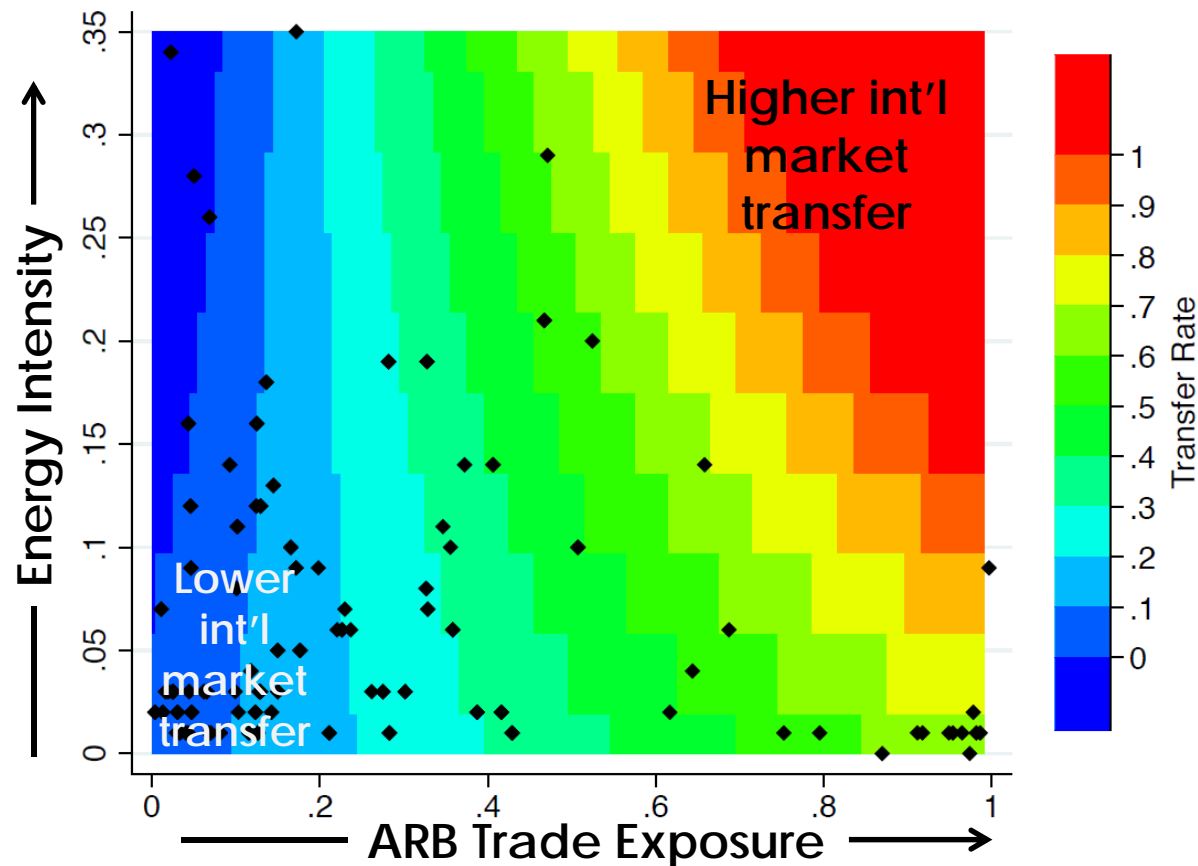
- ▣ Trade exposure metric measures how a compliance cost could induce a shift of California economic activity to international competitors
- ▣ International market transfer measures the fraction of each dollar drop in U.S. production offset by a dollar increase in international production
 - ▣ Fraction of each dollar drop is estimated for manufacturing sectors by UC Berkeley and CalPoly studies

New vs. Old Metrics: Emissions Intensity and Domestic Value-Added Loss

- Emissions intensity metric measures impact on California value added of industry-specific levels of emissions
- Domestic value-added loss measures the drop in California output that is picked up by increased out-of-State (non-international) industrial facilities
 - International impact already accounted for by international market transfer
- Key advantage over former approach—now have a measure of domestic leakage

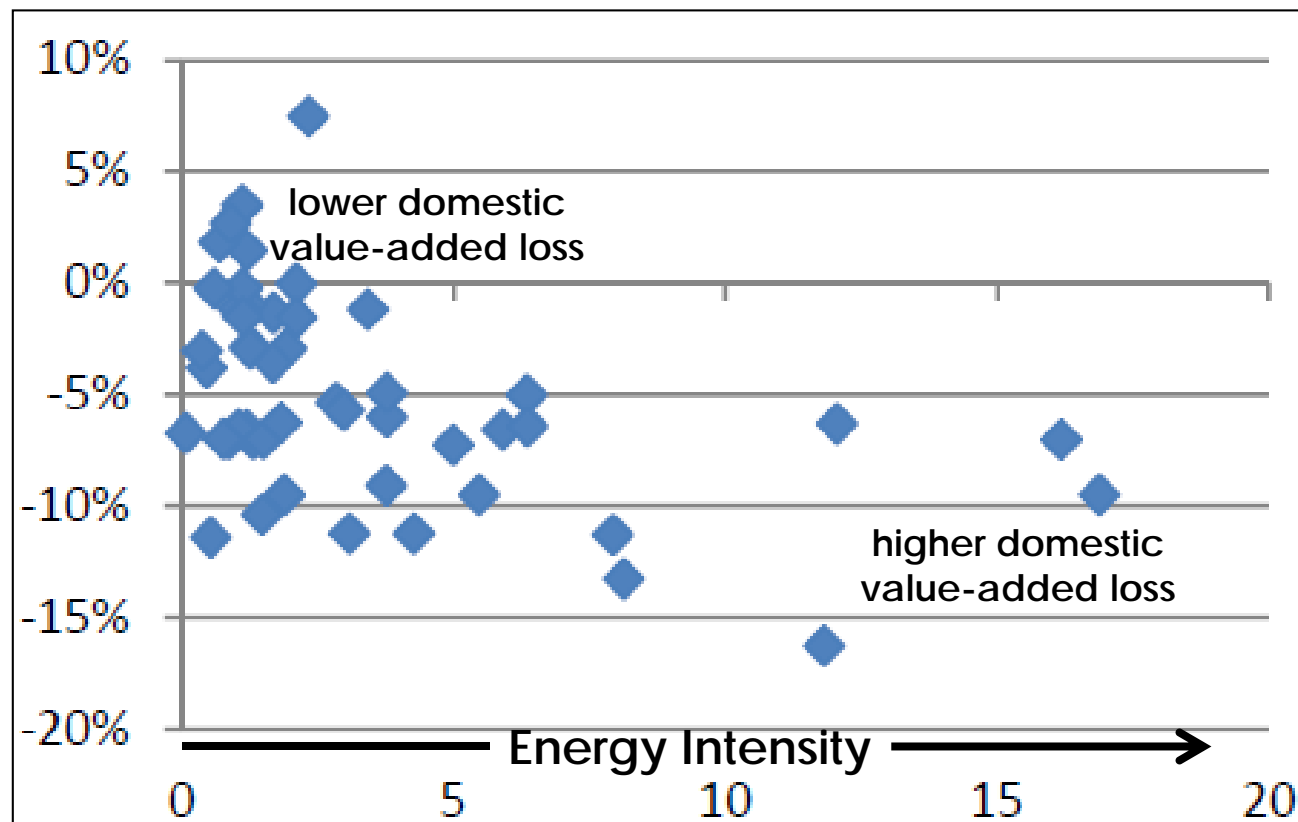
New vs. Old Metrics: International Market Transfer

- Sector-wide pattern that highly trade exposed and energy (\approx emissions) intensive industries \rightarrow larger market transfer

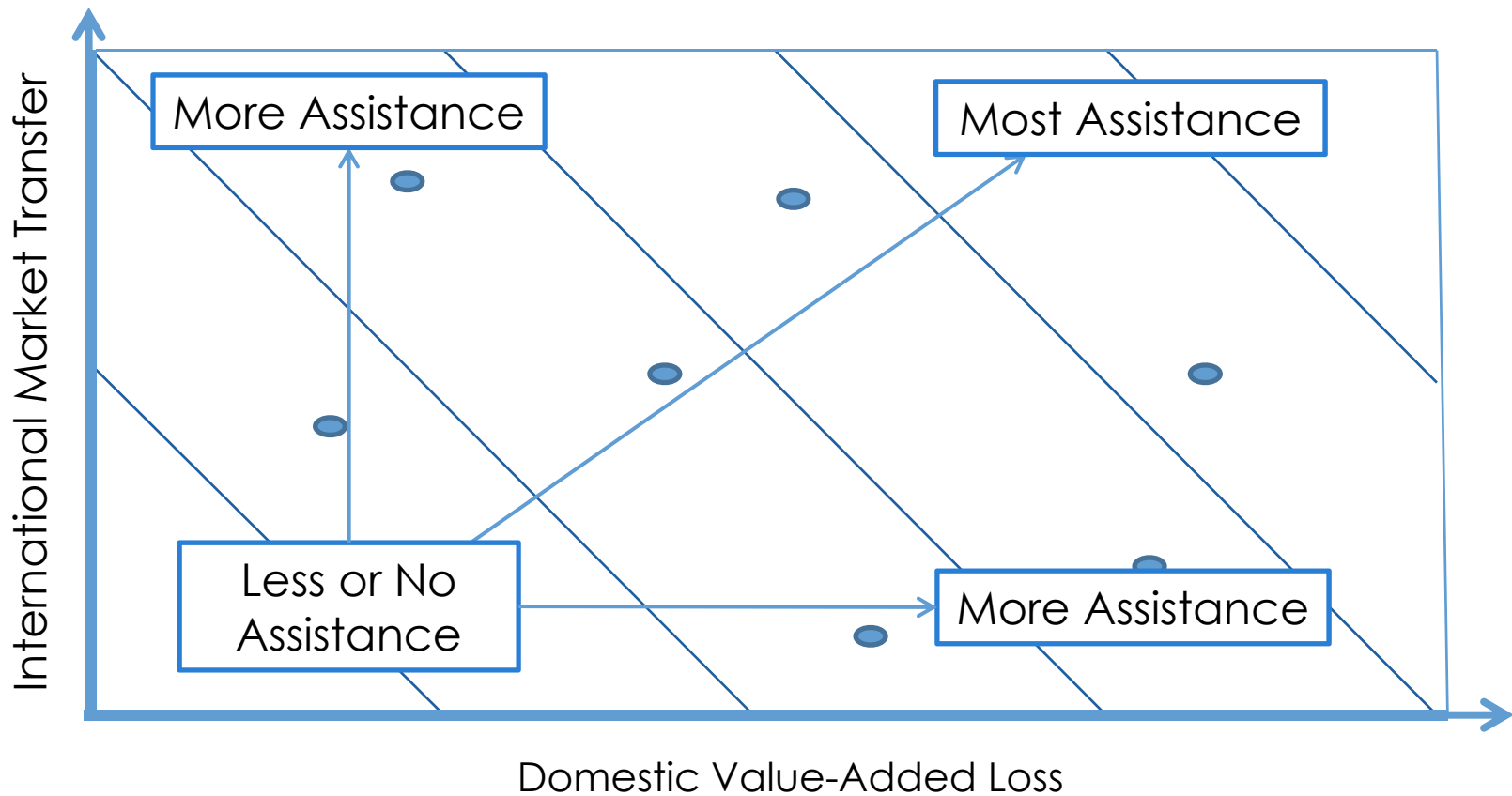


New Metrics Correlated with Old Metrics: Domestic Value-Added Loss

- Broad pattern: high energy (\approx emissions) intensive industries generally had larger domestic value-added loss %



Staff Conceptual Proposal: New Metrics



Non-Studied Sectors

- ▣ Contracted studies limited to manufacturing sectors only
- ▣ Key inputs to studies included each industry's:
 - ▣ Energy cost intensity (closely related to emissions intensity)
 - ▣ Trade exposure
- ▣ Staff will match non-studied sectors (e.g., mining) to most-similar studied sectors based on:
 - ▣ U.S. Census energy cost intensity
 - ▣ Trade exposure
- ▣ Seeking stakeholder comments if ARB should also match based on labor intensity

ARB Proposal is Conservative Approach

- ▣ ARB proposal is conservative in its application of study results to leakage risk and assistance factors
- ▣ Proposal uses short-term domestic value-added loss
 - ▣ Greater than long-term leakage risk estimates for all manufacturing sectors
- ▣ Domestic value-added loss estimates assume 100 percent of calculated California decline offset by expanded out-of-state production to best identify California output drop
 - ▣ Upper bound of domestic leakage
- ▣ International market transfer is an upper bound assuming that changes in net exports one-for-one increase foreign production

Regulatory Process

- Staff will propose updates to assistance factors in the initial regulatory change proposal to be released in July 2016
- Staff will present proposed changes to the Board at the September 2016 Board hearing

Looking Toward Future

- ▣ Long-run international market transfer
 - ▣ The domestic study found that industries adjust over time
 - ▣ International study considered short term changes only
 - ▣ Revisiting assistance factors in future may be appropriate
- ▣ Change to domestic market transfer
 - ▣ Domestic value-added loss conservatively assumes 100 percent of calibrated California reduction offset by increased out-of-state production
 - ▣ For now, this allows for some continued transition assistance
 - ▣ This is an upper bound of possible leakage, revisit assumption in future
- ▣ Short- to long-term domestic market transfer
 - ▣ Well-identified long-term estimates may be appropriate in future

Looking Toward Future

- ▣ As international and regional climate regulations are put in place, more of industry competition also faces a carbon price
 - ▣ This equalizes the playing field
 - ▣ Declining need for leakage assistance for California industries
- ▣ Help communicate opportunities for funding to spur industry research, development, and deployment (RD&D) to reduce emissions intensity
 - ▣ RD&D may be more effective than output-based allocation to help reduce industry-wide emissions intensity

Questions and Comments

Email questions today to sierrarm@calepa.ca.gov

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>

Contact information:

Derek Nixon, Air Pollution Specialist
derek.nixon@arb.ca.gov

Mary Jane Coombs, Manager
maryjane.coombs@arb.ca.gov