



The Interaction of Complementary Measures and the Cap & Trade Program under in AB32

Steve Fine
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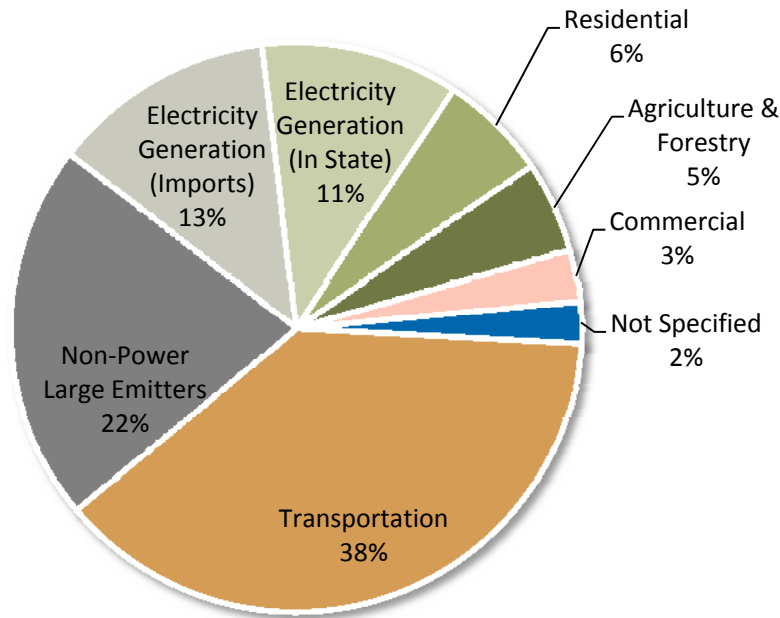
California Cap-and-Trade Overview

- California, through the Global Warming Solutions Act of 2006 - Assembly Bill 32 (AB 32) – requires California to reduce its greenhouse gas emissions to 1990 levels by 2020.
- The California Air Resources Board (ARB) has spent the last several years developing regulations to implement AB 32, which consists of a cap-and-trade program as well as a range of complementary measures to reduce GHG emissions.
- The cap-and-trade program will impact a wide spectrum of entities:
 - The power sector and other large emitters are faced with compliance obligations under the cap-and-trade program’s initial period in 2013 and 2014.
 - The program expands in 2015 to cover natural gas and transportation fuel providers, encompassing about 85% of California’s total GHG emissions.
- Entities that transact around power, fuel, and emissions markets in California—along with everyone who uses energy in the state—will be impacted to some degree by this legislation.

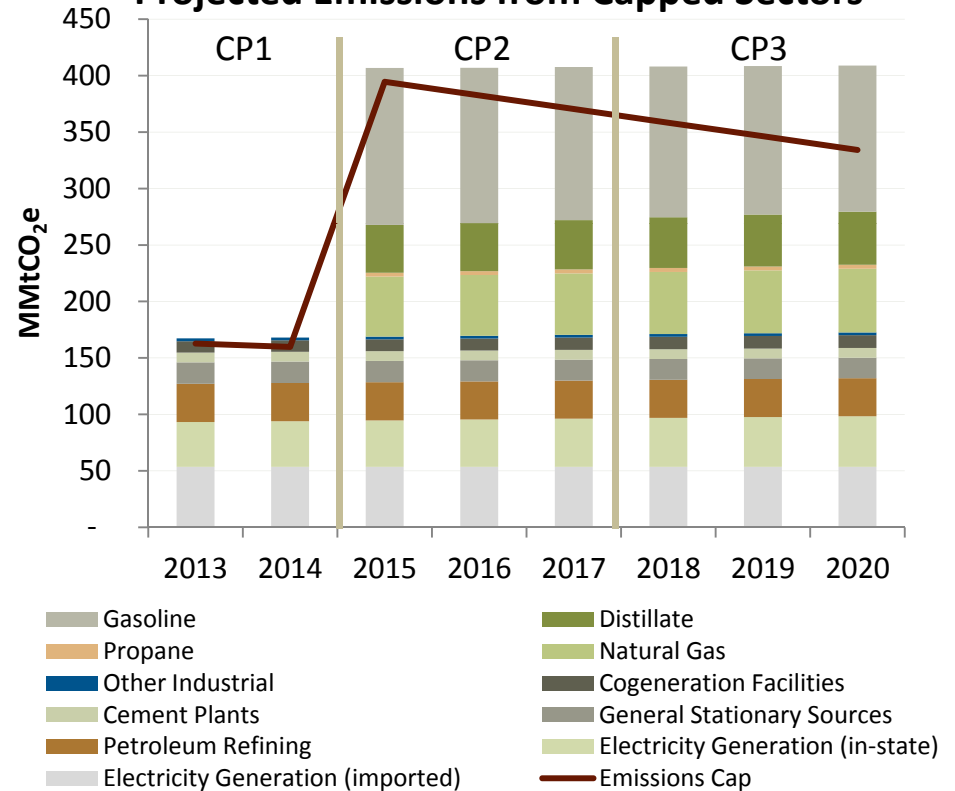
California's Baseline Emissions Projected – Covered Sectors

- Since 2000, California's GHG emissions, including those associated with imported power, have ranged from about 450 to 480 MMtCO₂e.

California GHG Emissions (2000-2008 Average)



Projected Emissions from Capped Sectors



Note: Baseline includes reductions due to Pavley I standard
Source: ARB

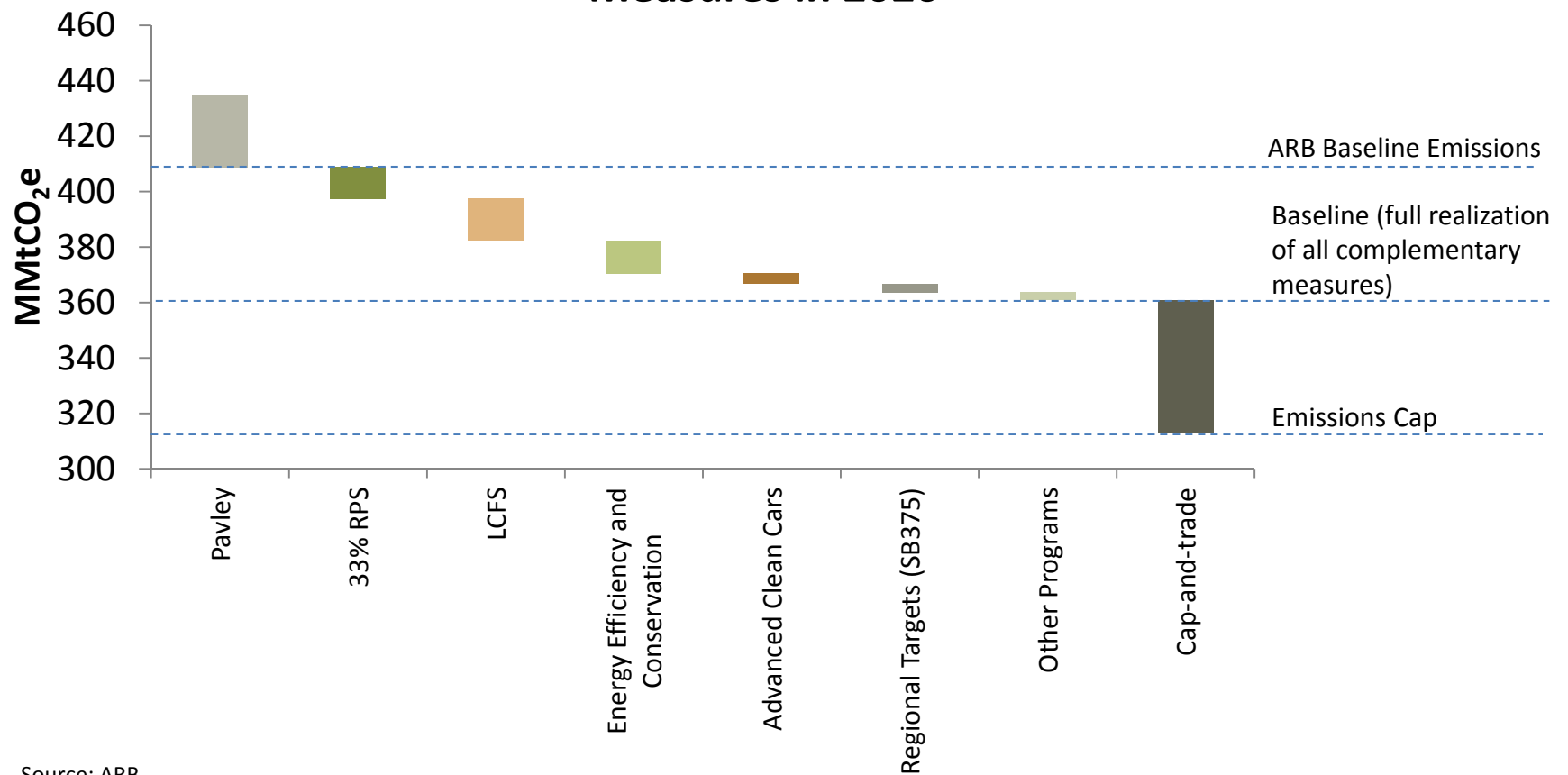
Complementary Measures in California

Measure	Sector	Expected Reductions in 2020 (MMtCO ₂ e)	Description
Pavley I	Transportation	26	Requires ARB to adopt cleaner vehicle standards (reduce GHG to the maximum extent technologically feasible) through 2016.
Renewable Portfolio Standard	Electricity	11	Achieve 33% renewables by 2020 (some portion will be achieved by Tradeable RECs, and will not reduce emissions in California).
Low Carbon Fuel Standard	Transportation Fuels	15	Target is to reduce carbon intensity of transportation fuels in California by at least 10% by 2020.
Energy Efficiency and Conservation	Electricity, Commercial and Residential	12	Various energy efficiency measures to reduce electricity and natural gas consumption.
Advanced Clean Cars	Transportation	4	Also referred to as Pavley II, or the Zero Emission Vehicles (ZEV) program, will require even more stringent standards for vehicles with model years from 2017 through 2025.
Regional Targets	Transportation	3	Also commonly referred to as, SB 375, it establishes mechanisms for the development of regional targets for reducing emissions from passenger vehicles.
Other Programs	Transportation	3	Vehicle efficiency standards, Goods movement system wide efficiency, Heavy Duty Aerodynamics, High Speed Rail, Medium/Heavy duty vehicle Hybridization

Source: ARB

Complementary Measures in California

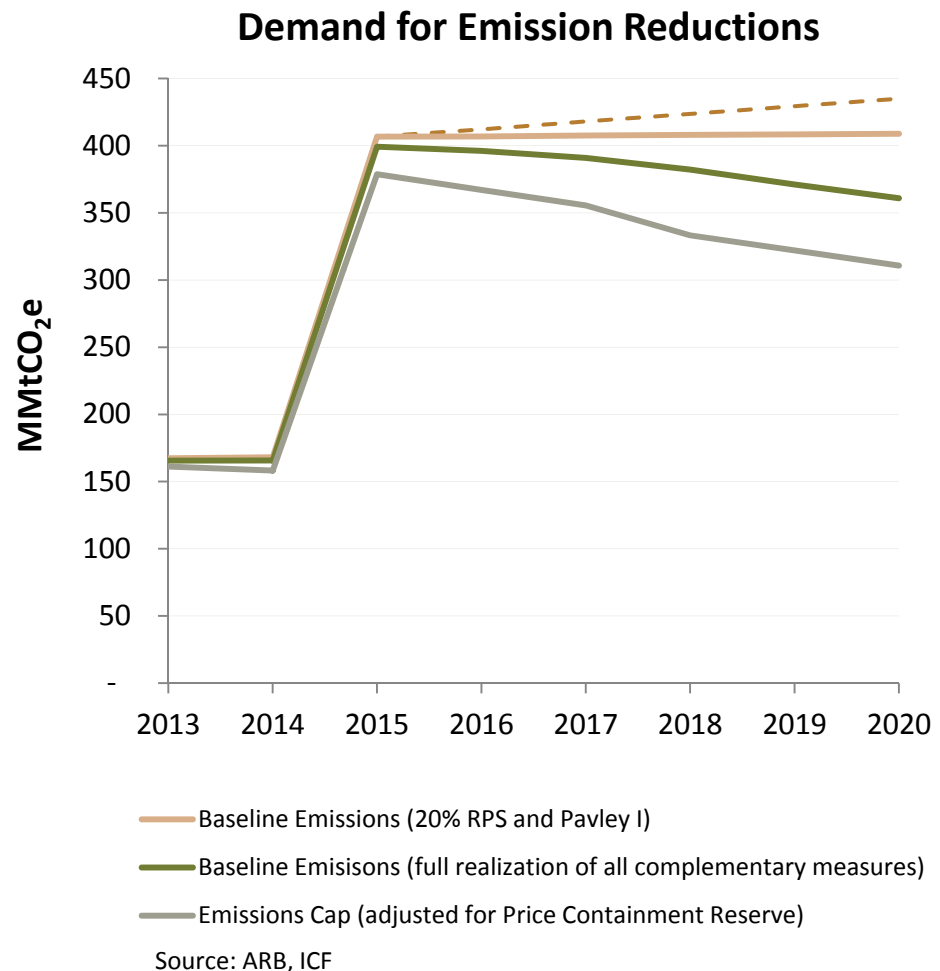
Projected Emissions Reductions from Complementary Measures in 2020



Source: ARB

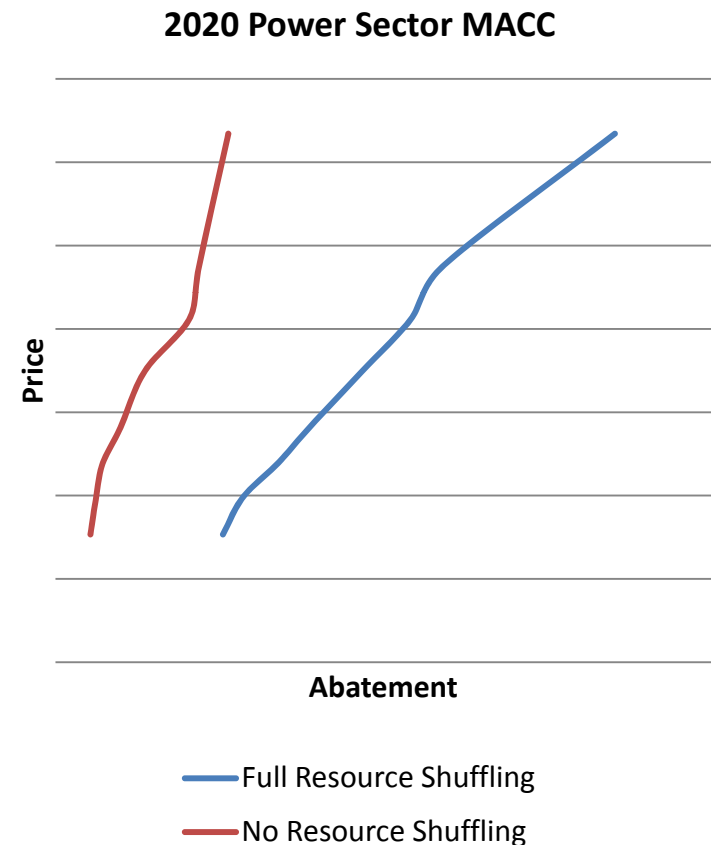
Complementary Measures in California

- Complementary measures are key to helping reduce the GHG Baseline. Those expected to yield the most emission reductions in California:
 - Pavley I standard reduces the baseline from 435 MMtCO₂e to 409 MMtCO₂e.
 - 33% RPS (incremental to 20%) reduces the baseline by another 11 MMtCO₂e to 397MMt.
 - Low carbon fuel standard, Regional transportation targets (SB 375), measures related to improving energy efficiency, etc., which further reduce the baseline from 397 MMt to 360 MMtCO₂e.
 - Measures related to improving energy efficiency and other.
- According to ARB, full implementation of all complementary measures could result in up to 75.1 MMtCO₂e of emissions reduction in 2020.
- The degree to which complementary measures are successful will have a significant impact on allowance prices.



Power Sector Resource Shuffling in California

- California imports a third of its power, representing approximately half of its power sector emissions.
 - If left unchecked, emissions leakage would be counted as a reduction against the emissions cap, even as overall regional emission levels are unchanged.
- ARB addressed this issue by extending its carbon regulations to imported power – “first jurisdictional deliverer.”
- “Contracted power” - the emissions rate assigned to the power contract between a California utility and the plant is consistent with the actual emissions rate of the plant.
- System power - not bilaterally contracted for, the imported power is assigned the WECC system emissions rate – currently ~950 lb/MWh.
- Significant questions remain about the potential to prevent resource shuffling.
- Letter from FERC Chairman Moeler to Gov. Brown led to ARB delaying the resource shuffling attestation provisions for 18 months.



Conclusions

- Complementary measures play a large role in determining the emissions baseline forecast going forward and therefore the effective stringency of the emissions cap and the resulting magnitude of the allowance price.
- AB32 contains 75MMT's CO₂e of complementary measures, 26MMT of which are "below the baseline" (Pavley I)
 - Another 11MMT from RPS pretty much assured
 - 38MMT still to go, LCFS is most controversial
- Cap and Trade portion of AB32 responsible for 48 MMT's of reductions
- Offsets and non-power large emitters are expected to provide over 50% of on-system reductions if resource shuffling is effectively prevented.

Contact Information

Steve Fine
Vice President
Energy Advisory Services
703-934-3302
steve.fine@icfi.com