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May 10, 2017

Cap-and-Trade

L E G I S L A T I V E A N A L Y S T ' S O F F I C E

Presented to:
Senate Environmental Quality Committee
Hon. Bob Wieckowski, Chair

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State GHG Goals and Policies

☑ The Global Warming Solutions Act of 2006 (Chapter 488 [AB 32, Núñez/Pavley])

- Established the goal of reducing greenhouse gas (GHG) emissions statewide to 1990 levels by 2020.
- Directed the Air Resources Board (ARB) to adopt regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions by 2020. Authorized ARB to adopt cap-and-trade regulation through 2020.

☑ State Established a Variety of Policies to Meet 2020 Target

- Scoping Plan developed by ARB includes 33 percent renewable portfolio standard (RPS), low carbon fuel standard, energy efficiency, and cap-and-trade.

☑ Recent Legislation Established 2030 GHG Target and Policy Direction

- Chapter 249 of 2016 (SB 32, Pavley) established GHG target of at least 40 percent below 1990 levels by 2030.
- Chapter 250 of 2016 (AB 197, E. Garcia) directs ARB to prioritize regulations that result in direct GHG emission reductions.
- Other legislation provides more specific direction regarding some of the policies that must be used to achieve the 2030 target, including a 50 percent RPS, doubling energy efficiency, and activities to reduce short-lived climate pollutants.

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How Cap-and-Trade Works

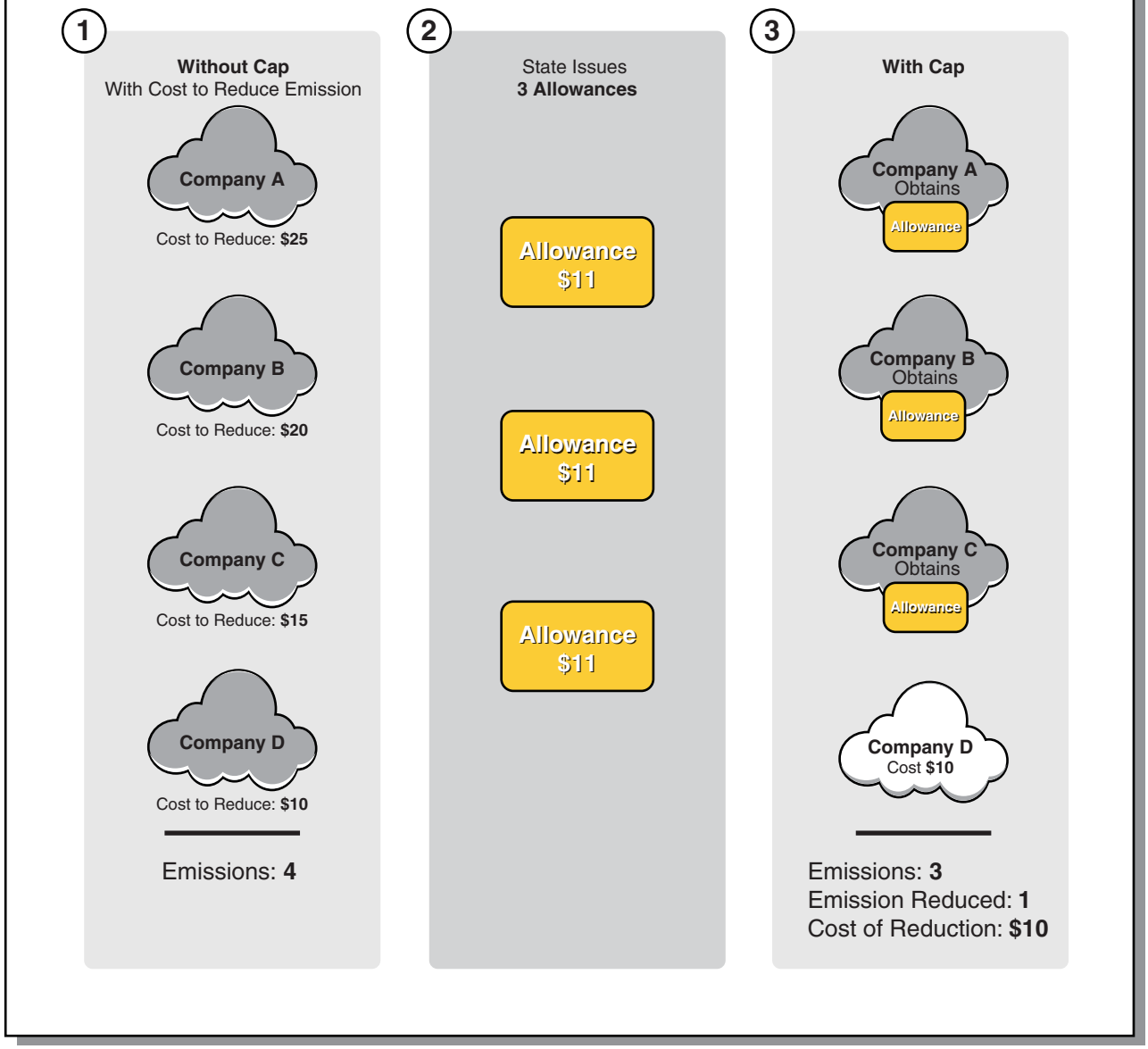
- ***Market-Based.*** One type of market-based approach to reducing emissions. (The other is a carbon tax.)

- ***The Cap.*** The cap-and-trade regulation places a "cap" on aggregate GHG emissions from large GHG emitters, such as large industrial facilities, electricity generators and importers, and transportation fuel suppliers. Capped sources of emissions are responsible for roughly 80 percent of the state's GHG emissions.

- ***Allowance Trading.*** To implement the cap-and-trade program, ARB issues carbon allowances equal to the cap, and each allowance is essentially a permit to emit one ton of carbon dioxide equivalent. Entities can also "trade" (buy and sell on the open market) the allowances in order to obtain enough to cover their total emissions.

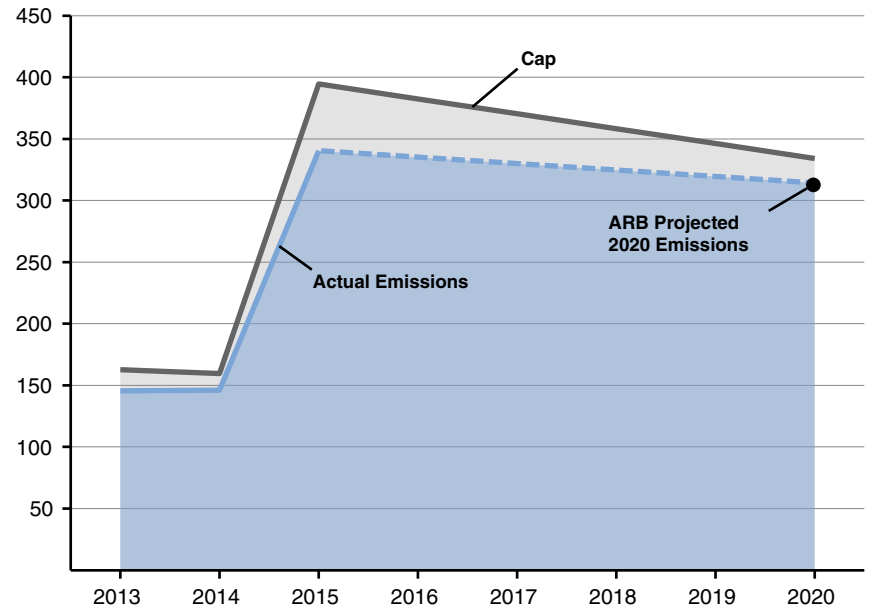
Primary Advantage of Cap-and-Trade: Cost-Effective Reductions

Cap-and-Trade Designed to Limit Emissions at Lowest Cost



Emissions Below Cap in Early Years of Program

ARB Data Suggest Emissions Below the Cap

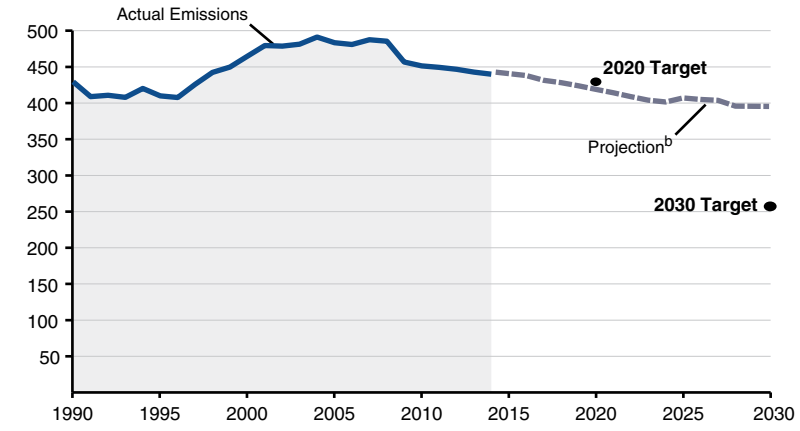


[a] Beginning January 2015, transportation and natural gas fuel supplies were included in the program.

ARB = Air Resources Board and MMtC02e = million metric tons of carbon dioxide equivalent.

New 2030 Goal Likely More Difficult to Achieve Than 2020 Goal

SB 32[a] Requires More Greenhouse Gas Reductions by 2030



[a] Chapter 249 of 2016 (SB 32, Pavley).
[b] Projection from Air Resources Board based on actions that have been taken to achieve the 2020 target.
MMtCO2e = million metric tons of carbon dioxide equivalent.

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Options for Achieving More Agressive 2030 Target

January Scoping Plan Alternatives to Achieve 2030 Goal

	Options For Meeting 2030 Goals					
	Proposal: Cap-and-Trade + Others	Alternative 1: No Market-Based Mechanism	Alternative 2: Carbon Tax + Others	Alternative 3: Cap-and-Trade Only	Alternative 4: Cap-and-Tax + Others	Estimated Cost Per Ton
Policies Enacted by the Legislature						
50 percent RPS	✓	✓	✓	✓	✓	$100 to $300
Double energy efficiency	✓	✓	✓	✓	✓	-550 to -$300
Reduce SLCPs	✓	✓	✓	✓	✓	N/A
Demand response	✓	✓	✓	✓	✓	-200
Additional Scoping Plan Measures						
Market-based approaches						
Extend cap-and-trade	✓			✓		25 to 85
Carbon tax			✓			50
Complementary Policies						
Mobile Source Sustainable Freight initiatives	✓	✓	✓	✓	✓	Less than 50
Reduce refinery emissions by 20 percent	✓	✓	✓		✓	70 to 200
Reduce refinery emissions by 30 percent		✓				70 to 200
Increase LCFS to 18 percent	✓	✓	✓		✓	250
Increase LCFS to 25 percent		✓				400
Increase RPS to 60 percent		✓				300 to 450
Reduce emissions from oil production by 25 percent		✓				70 to 200
Reduce other industrial emissions by 25 percent		✓				70 to 200
Increase renewable natural gas by 5 percent		✓				300 to 1500
ZEVs and vehicle retirement incentives[a]		✓				-150 to 200
Energy efficiency[b]		✓				100 to 200
Other						
Cap-and-tax					✓	N/A

[a] In addition to what is included in the Mobile Source Strategy and Sustainable Freight Initiative.

[b] In addition to doubling energy efficiency savings, as required by SB 350.

RPS = renewable portfolio standard; SLCPs = short-lived climate pollutants; ZEVs = zero emission vehicles; LCFS = low carbon fuel standard; N/A = not available; and SLCP = short-lived climate pollutants.

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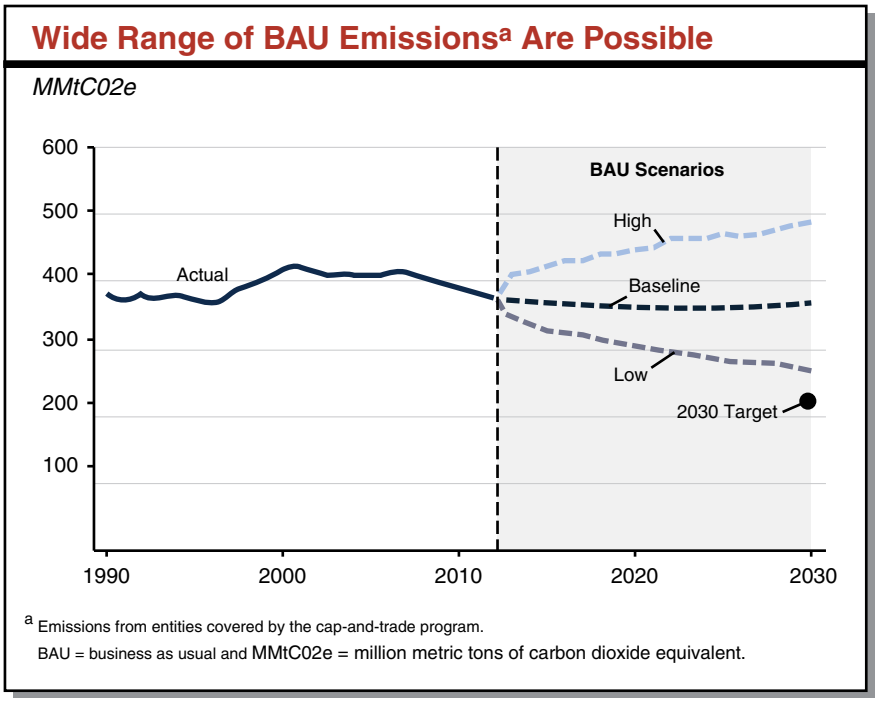
Substantial Emissions and Cost Uncertainty



- As shown in the figure above, business as usual emissions are uncertain. For example, unexpected changes in statewide economic activity could affect emissions.
- Costs of different emissions reduction activities also uncertain. For example, unexpected technological changes could affect overall costs of reducing emissions.

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Certain Key Design Considerations

☑ **Distributing Allowances and Mitigating Leakage**

- Auctions are generally the preferred method of distributing allowances. Recommended by economists because they maintain price signal for cost-effective reductions and prevent windfall profits to businesses.
- Primary exception is when allowances are given to businesses to prevent emissions "leakage." Currently, about 15 percent of allowances are used to prevent emissions leakage for trade exposed industries.

☑ **Allowance Price Floor and Ceiling to Limit Price Uncertainty**

- Price floor intended to limit prices from going below a predetermined level and ensure a minimum level of incentive to reduce emissions. Primary trade-off is that allowance prices, and overall costs, could be higher than what is needed to meet the GHG target.
- Price ceiling intended to limit prices from going above a predetermined level and ensure GHG reduction costs do not exceed a threshold that policy makers deem unreasonable. Primary trade-off is that emissions could exceed the cap.
- Limiting allowance price uncertainty helps businesses and households make more effective decisions about potential long-term GHG reduction investments.
- In our analysis of the Governor's 2017-18 budget proposal to extend cap-and-trade, we recommend the Legislature strengthen the allowance price ceiling to provide greater price certainty to households and businesses and limit potential costs.

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Certain Key Design Considerations *(Continued)*

☑ **Allocating Auction Revenue**

- From an economic perspective, auction revenues are often thought of as a byproduct of cap-and-trade programs and not their primary goal. In some cases, allocating auction revenue to GHG reduction programs could result in more costly overall GHG reduction activities.
- In our analysis of the Governor's proposal to extend cap-and-trade, we recommend the Legislature authorize the program with two-thirds vote, broaden allowable use of funds, and allocate revenues based on highest priorities. Given the potential for significantly higher future energy costs as a result of the program, we suggest the Legislature make strategies that would offset these costs a high priority. This could include providing rebates and/or reducing other taxes for households and businesses.