

## Comments on the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Measures

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We are academic economists who have spent considerable time studying the design and implementation of cap-and-trade and other climate policy instruments. We wish to make the following observations about the proposal to extend and modify California's cap-and-trade system for greenhouse gasses beyond 2020.

### I. Regarding GHG cap and trade market design

We believe that market-based policy incentives should play a prominent role in achieving SB 32's goals, and that adapting the current cap-and-trade scheme is by far the least disruptive policy for achieving this. Cap-and-trade systems give emitters the flexibility to find the most cost-effective strategies for emissions reductions while maintaining strong incentive for innovation, both features that are absent under traditional command and control regulatory measures, as James Bushnell discussed in a blog<sup>2</sup> on November 21, 2016 and Meredith Fowlie discussed in a blog<sup>3</sup> on June 20, 2016.

Furthermore, dropping cap-and-trade at this point would threaten the regional expansion of market-based GHG policies. The Canadian provinces of Quebec and Ontario are committed to a linked cap-and-trade system, while regional neighbors such as Oregon and Washington state are either considering or have already adopted caps that could be made compatible with California's system. And many countries, including China, look to California's cap-and-trade program as a valuable model. Therefore one of the most important objectives of AB 32 -- for California's example to be emulated by other areas -- is becoming a reality. That progress would be greatly disrupted, if not halted completely, if California were to withdraw from the cap-and-trade system.

Still, we recognize that pure cap-and-trade program would be subject to potentially extreme price volatility (as Borenstein, Bushnell, and their co-authors Frank Wolak and Matthew Zaragoza-

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<sup>2</sup> James Bushnell, "Looking for Environmental Certainty in All the Wrong Places," Energy Institute at Haas blog, November 21, 2016. <https://energyathaas.wordpress.com/2016/11/21/looking-for-environmental-certainty-in-all-the-wrong-places/>.

<sup>3</sup> Meredith Fowlie, "Time to Unleash the Carbon Market," Energy Institute at Haas blog, June 20, 2016. <https://energyathaas.wordpress.com/2016/06/20/time-to-unleash-the-carbon-market/>

Watkins showed in an August 2016 working paper<sup>4</sup>), which is why we strongly advocate firm floor and ceiling prices as part of the extension of California's program to 2030, as Severin Borenstein discussed in a blog<sup>5</sup> on August 15, 2016.

## II. Regarding cap and trade alternatives

Capping greenhouse gas emissions from individual facilities, or even a small set of facilities, could greatly increase the cost of meeting state-wide GHG emissions reduction targets. In its recent update to the economic analysis of its scoping plan, the ARB estimated that the "cap-and-tax" scenario would more than double direct compliance costs and, more significantly, lead to lost California production on the order of tens of Billions of dollars.<sup>6</sup>

Individual facility caps also increase the risks of emissions leakage. The higher the costs incurred by a firm to comply with the regulation, the more likely it becomes that production (and associated emissions) are induced to move outside the state. One obvious option for complying with a facility specific cap is to shut the facility down more frequently or for extended periods of time. In the case of refineries, this would almost certainly increase the import of refined product into California and sharply increase fuel prices. Evidence supporting this outcome can be found in the California gasoline markets response to the outage of the Exxon-Mobil Torrance refinery that began in February 2015. California ARB emissions data show that direct emissions from this refinery fell by 15 million metric tons in 2015 as a result of the outage. However, California gasoline consumption did not decline in 2015, despite significant increases in refinery margins.<sup>7</sup> The lost supply was made up through increased output from the remaining operable California refineries and from increased imports. If binding emissions limits on the remaining refineries had been in place during 2015, further pressure would have been placed on both imports and on price increases to balance the gasoline market.

Facility level caps have been proposed in large part under the belief that such policies would best address concerns over local pollutants. However, as Severin Borenstein discussed in a January 17, 2017 blog<sup>8</sup>, regulating GHG at specific facilities is not the same as capping or directly regulating local pollutants at those same facilities. Discussions regarding the cap and tax proposal seem to assume that a reduction in GHG from a facility will produce a proportional reduction in local pollutants. It is possible that this will not be true. In fact, there are scenarios in which capping GHG at a facility could have no effect on local pollutants from that facility or even lead to an increase.

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<sup>4</sup> Severin Borenstein, James Bushnell, Frank Wolak and Matthew Zaragoza-Watkins, "Expecting the Unexpected: Emissions Uncertainty and Environmental Market Design," Energy Institute at Haas Working Paper #274, August 2016, <http://ei.haas.berkeley.edu/research/papers/WP274.pdf>

<sup>5</sup> Severin Borenstein, "Fixing a Major Flaw in Cap and Trade," Energy Institute at Haas blog, August 15, 2016. <https://energyathaas.wordpress.com/2016/08/15/fixing-a-major-flaw-in-cap-and-trade/>

<sup>6</sup> California Air Resources Board, "2017 Scoping Plan Update," March 28, 2017. <https://www.arb.ca.gov/cc/scopingplan/meetings/032817/sp-march-workshop-slides.pdf>

<sup>7</sup> California Board of Equalization. Net Taxable Gasoline Gallons. [http://www.boe.ca.gov/sptaxprog/reports/MVF\\_10\\_Year\\_Report.pdf](http://www.boe.ca.gov/sptaxprog/reports/MVF_10_Year_Report.pdf)

<sup>8</sup> Severin Borenstein, "Fight Both Local and Global Pollution, But Separately," Energy Institute at Haas Blog, January 17, 2017. <https://energyathaas.wordpress.com/2017/01/17/fight-local-and-global-pollution-but-separately/>

### III. Regarding the impacts of GHG emissions trading on disadvantaged communities

Some have concluded that, under California's GHG cap-and-trade program, program benefits are being exported while GHG emissions increase in disadvantaged (EJ) communities. The analysis of Cushing, et al.<sup>9</sup>, has been advanced as evidence to this effect. As Meredith Fowlie discussed in an October 10, 2016 blog<sup>10</sup>, we do not think that conclusions about the impacts of GHG emissions trading on local pollution in EJ communities can be drawn from this study.

Cushing et al. compare GHG emissions at regulated facilities during the first two years of the program (2013-2014) against emissions at those same facilities in the years preceding (2011-2012). The researchers document increases in emissions in some sectors (and reductions in others) over this time period. The authors themselves emphasize the preliminary nature of the analysis. We further note that these pre-post comparisons can confuse the effects of a policy with the effects of other factors that are changing over time. For example, the electricity sector is one of the sectors where researchers document a small increase in GHG emissions over the pre- and post-policy period. The San Onofre nuclear plant in early 2012 was a major driver of this observed increase. It would be wrong to attribute any emissions implications of this plant closure to GHG emissions trading.

The Cushing et al. report highlights trends in in-state GHG emissions and the use of offsets, which warrant further investigation. But it does not provide a basis for concluding that EJ communities have been harmed under GHG emissions trading. A recent analysis<sup>11</sup> by Kyle Meng examining emissions trends during the first years of the cap-and-trade program, using the same GHG data source, suggests that, if anything, GHG emissions declines have been slightly greater in EJ areas, though that the difference is not statistically significant.

Addressing concerns about local pollution exposures in disadvantaged communities must be part of the larger policy discussion. However, attempting to regulate global and local pollution *with the same regulation* will result in a policy that does neither job well. Concerns about local pollution do not provide a reason to abandon cap and trade in favor of more prescriptive regulations. Market-based regulation of greenhouse gas emissions can be used to coordinate a cost-effective response to climate change, while generating revenues that can be used to support local air quality improvements.

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<sup>9</sup> Lara J. Cushing, Madeline Wander, Rachel Morello-Frosch, Manuel Pastor, Allen Zhu, and James Sadd, "A Preliminary Environmental Equity Assessment Of California's Cap-and-Trade Program" [http://dornsife.usc.edu/assets/sites/242/docs/Climate\\_Equity\\_Brief\\_CA\\_Cap\\_and\\_Trade\\_Sept2016\\_FINAL2.pdf](http://dornsife.usc.edu/assets/sites/242/docs/Climate_Equity_Brief_CA_Cap_and_Trade_Sept2016_FINAL2.pdf)

<sup>10</sup> Meredith Fowlie, "Is cap and trade failing our low income and minority communities?" Energy Institute at Haas Blog, October 10, 2016. <https://energyathaas.wordpress.com/2016/10/10/is-cap-and-trade-failing-low-income-and-minority-communities/>

<sup>11</sup> Kyle Meng, "Is cap-and-trade causing more greenhouse gas emissions in disadvantaged communities?", April 2017. [https://www.dropbox.com/s/ka0a884oxkotxhj/Meng\\_CT\\_EJ.pdf?dl=1](https://www.dropbox.com/s/ka0a884oxkotxhj/Meng_CT_EJ.pdf?dl=1).