Since the landmark enactment of California’s Global Warming Solutions Act in 2006, also known by its bill number AB 32, California has had one of the most ambitious economy-wide greenhouse gas (GHG) emissions limits in the world. That law requires California to return to 1990 levels of statewide GHG emissions by 2020—a benchmark that the state is well on its way to meeting. The state legislature has recently embraced an even more ambitious climate target and given regulators new tools for getting there. Those new enactments, and their relationship to AB 32, are the subject of this briefing paper and of the first panel in today’s symposium.

The California State Legislature enacted several statutes in August 2016 related to the state’s GHG emissions reductions targets. Senate Bill 32 (SB 32) sets a new limit for GHG emissions in the state, requiring a reduction in emissions to 40% below 1990 levels by 2030. Assembly Bill 197 (AB 197) increases legislative oversight of ARB and gives ARB additional direction about how to achieve the new 2030 GHG limit. And SB 1383 establishes specific reduction goals for non-CO2 climate pollutants and directs ARB on how to achieve those goals. More detail on each statute is provided below, along with some commentary as to the legal questions they raise about implementation and the pathway to 2030.

This paper provides an overview of these state climate laws in order to give symposium attendees a common background for understanding today’s discussions.

I. AB 32: The Global Warming Solutions Act

AB 32 charges the state’s Air Resources Board (ARB) with returning the state to its 1990 level of greenhouse gas emissions by the year 2020; with maintaining that statewide emissions limit indefinitely; and with “continu[ing] reductions in greenhouse gases beyond 2020.”¹ In passing AB 32, the Legislature found and declared that “[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California.”² The Legislature’s aims included “continu[ing] [the state’s] tradition of

¹ Cal. Health & Safety Code Sec. 38550; 38551(a), (b) (West 2014).
environmental leadership by placing California at the forefront of national and international efforts to reduce emissions of greenhouse gases."

AB 32 tasks ARB with developing rules to achieve the “maximum technologically feasible and cost-effective greenhouse gas emission reductions.” The statute gives significant discretion to ARB to promulgate and implement such rules, but it also directs the agency toward a series of objectives alongside emission reductions. The statute requires ARB, in designing its program, to (among other things):

- minimize costs;
- maximize cost-effectiveness;
- encourage early action to reduce emissions;
- distribute emissions allowances in an equitable manner; and
- maximize total benefits to California.

Among the measures that AB 32 authorizes are “market-based compliance mechanisms,” which include a cap-and-trade system for limiting greenhouse gas emissions. The statute requires that for any market-based system, ARB “shall” “[d]esign the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize total benefits to California, and encourages early action to reduce greenhouse gas emissions.” It also specifically instructs ARB to “maximize additional environmental and economic benefits for California” from the market-based program.

In response to AB 32, ARB identified and began implementing a suite of programs to reduce GHG emissions from a variety of sources. The suite of programs includes direct regulations and market-based mechanisms. Among the measures ARB has adopted is a cap-and-trade program that imposes a declining cap on 85% of statewide GHG emissions. A cap-and-trade program for pollutant emissions seeks to cap overall emissions while allowing emitters flexibility in whether and how to decrease their individual emissions. It works as follows: A regulating body caps overall emissions and allocates allowances to emitters. Each allowance gives its holder the right to emit a set amount of pollution, typically one ton per allowance. Allowance holders can satisfy their regulatory obligations either by emitting up to the amount they hold in allowances, trading for additional allowances if they need to emit more, or emitting less than their allocated amount and selling/trading the difference. The system encourages emitters to find the cheapest means to reduce emissions.

3 Cal. Health & Safety Code Sec. 38501(c).
7 Cal. Health & Safety Code Sec. 38570(b)(3).
California’s cap-and-trade program sets a declining, statewide cap on the emission of CO$_2$ and other greenhouse gases.\footnote{See generally Cal. Air Res. Bd., ARB Emissions Trading Program Overview, available at http://www.arb.ca.gov/newsrel/2010/capandtrade.pdf.} Businesses and other entities included in the program must obtain and surrender to ARB sufficient allowances to cover their GHG emissions, with one allowance equaling an authorization to emit up to the potential warming equivalent of 1 metric ton of carbon dioxide.\footnote{California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms, Cal. Code Regs. Sec. 95802(a)(8).} It covers sources in the electricity industry (including imported electricity), large industrial facilities, and fuel distributors.

The cap-and-trade program runs only through the year 2020. ARB’s authority to extend the program beyond 2020 using existing law is uncertain. There are several current efforts in the Legislature to pass a new statute that would shore up that authority.\footnote{See Sean Hecht, The Future of California’s Greenhouse Gas Cap and Trade Program After 2020: A Conversation, May 9, 2017, http://legal-planet.org/2017/05/09/the-future-of-californias-greenhouse-gas-cap-and-trade-program-after-2020-a-conversation/}

II. \textbf{SB 32}

One of the new climate bills enacted last summer by the California Legislature is SB 32. That law enshrines into statute an ambitious greenhouse gas emissions target, requiring reductions in statewide GHG emissions to 40% below 1990 levels by 2030.

The text of SB 32 is very short. Section 1 finds that GHG reductions are “critical for the protection of all areas of the state, but especially for the state’s most disadvantaged communities.” It also calls on ARB to “achieve the state’s more stringent greenhouse gas emission reductions in a manner that benefits the state’s most disadvantaged communities and is transparent and accountable to the public and the Legislature.” The operative portion of SB 32, Section 2, is only one paragraph, added as Section 38566 of the Health and Safety Code. It reads:

\begin{quote}
In adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions authorized by this division [Division 25.5 of the Health and Safety Code, which is the codification of AB 32], the state board shall ensure that statewide greenhouse gas emissions are reduced to at least 40 percent below the statewide greenhouse gas emissions limit no later than December 31, 2030.\footnote{Cal. Health & Safety Code Sec. 385566.}
\end{quote}

SB 32 does not amend any portion of the earlier GHG statutory framework. Instead, it builds on AB 32 to set this new, ambitious 2030 GHG limit. Importantly, it leaves open the question of what regulatory tools ARB may or should use to achieve that GHG limit. It leaves in place the mandate from AB 32 to adopt regulations that achieve the “maximum technologically feasible” and “cost-effective” GHG reductions.\footnote{See Cal. Health & Safety Code Sec. 38560.} And it does not explicitly address the question of cap-and-trade after 2020.

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Assembly Bill 197 (AB 197) was passed as a companion bill to SB 32 last summer; neither would have gone into effect without the other. It increases legislative oversight of ARB and gives ARB additional direction about how to achieve the state’s new 2030 GHG limit. It has four main effects:

1. It places constraints on ARB’s adoption of regulations to meet SB 32’s 2030 target, by requiring ARB to “consider” social costs and to “prioritize” “direct emission reductions” from certain regulated sources;
2. It imposes transparency requirements on ARB’s operations, mandating availability of certain ARB data online;
3. It gives the legislature additional oversight of ARB, by placing two non-voting, ex officio legislators on the board; and
4. It creates a joint legislative committee focused specifically on climate change, which may affect how climate legislation is proposed and adopted in the state in the future.

The first effect limits ARB’s discretion to adopt measures to reduce California’s GHG emissions to meet SB 32’s mandate. AB 197 adds a new section to the AB 32 framework, to be codified as Cal. Health & Safety Code Section 38562.5. The new section applies to ARB “[w]hen adopting rules and regulations . . . to achieve emissions reductions beyond the [1990] statewide greenhouse gas emissions limit and to protect the state’s most impacted and disadvantaged communities[.]”\textsuperscript{13} The statute incorporates by reference the existing factors that ARB must consider in crafting GHG regulations, and further provides that ARB “shall . . . consider the social costs of the emissions of greenhouse gases” and “prioritize” “rules and regulations that result in direct emission reductions” at large stationary sources, from mobile sources, and other sources.\textsuperscript{14} The degree and effect of these limitations remain to be seen. The following questions are key:

a. \textit{What is meant by the requirement to consider the “social costs” of GHG emissions?}

Section 3 of AB 197 defines “social costs” as “an estimate of the economic damages, including, but not limited to, changes in net agricultural productivity; impacts to public health; climate adaptation impacts, such as property damages from increased flood risk; and changes in energy system costs, per metric ton of greenhouse gas emission per year.”\textsuperscript{15} No further guidance in the statute describes the scope of ARB’s requirement to “consider” social costs of GHG emissions.

\textsuperscript{13} AB 197, Sec. 5.
\textsuperscript{14} AB 197, Sec. 5.
\textsuperscript{15} AB 197, Sec. 3.
This new provision should probably be read together with all of the requirements in Cal. Health & Safety Code Sec. 38562, which was part of the original AB 32. Some of the provisions in Sec. 38562(b) include:

(b) In adopting regulations [for GHG emission reduction], to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit, the state board [ARB] shall do all of the following:

1. Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California.
2. Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.
3. Consider cost-effectiveness of these regulations.
4. Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.16

In other words, AB 32 already has in place some requirements for factoring in cost-effectiveness, equity and distributional concerns. Whatever AB 197 added was intended to provide additional guidance and constraint. One difference is that AB 32 limits the application of its list of considerations “to the extent feasible,” while AB 197 does not place such a limit. Also, while AB 32 speaks of “societal benefits” from GHG reduction, AB 197 is focused on impacts and costs. AB 197’s “social cost” language also seems to be limited to the social cost of GHG emissions, rather than the broader question of the indirect cost of other air pollutants associated with GHG emissions or the co-benefits of reducing such air pollutant emissions.

b. What are “direct emission reductions”?

AB 32 defines a “direct emission reduction” as “a greenhouse gas emission reduction made by a greenhouse gas emission source at that source.”17 This stands in contrast with other concepts defined in AB 32: alternative compliance mechanisms and market-based compliance mechanisms.

Alternative compliance mechanisms, by definition under the statute, must “achieve[] the equivalent reduction of greenhouse gas emissions over the same time period as a direct emission reduction” and must be approved by ARB. They include, for example, “flexible compliance schedule, alternative control technology, a process change, or a product substitution.”18 Market-based compliance must also “result in the same greenhouse gas emission reduction, over the same time period, as direct compliance with a greenhouse gas emission limit or emission reduction measure[].”19 AB 32 envisions a market-based cap-and-trade system as within the definition of market-based compliance, as well as GHG “exchanges, banking, credits, and other transactions” as provided and regulated by ARB.

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16 Cal. Health & Safety Code Sec. 38562(b) (emphasis added).
These definitions raise key questions about the types of changes that result in emissions reductions, especially at stationary sources. Under AB 32, “process changes” and “product substitutions” (which may or may not be interpreted to include fuel-switching at a power plant) are both listed as examples of “alternative compliance mechanisms.” Yet such changes also may result in greenhouse gas emission reductions “made by a source at that source,” and would therefore seem to meet the definition of direct emission reductions. Should regulations that require such process changes and product substitutions be interpreted as resulting in “direct emission reductions” under AB 197? 

For mobile sources, defining and achieving “direct emission reductions” could be more straightforward. Car emissions standards directly reduce GHG emissions, as well as other emissions, from vehicles. Programs to reduce vehicle miles traveled would also entail direct reductions by mobile sources.

c. What does it mean to “prioritize” direct emission reductions?

AB 197 requires ARB to “prioritize” “rules and regulations that result in direct emission reductions” at large stationary sources, from mobile sources, and other sources. How much does this constrain ARB’s discretion to choose among competing emission reduction tools with a range of benefits and drawbacks? What must ARB show or demonstrate in order to meet the requirement that it “prioritize” direct emission reductions? Must it achieve direct emission reductions whenever possible? Must it consider direct emissions reductions first, but not necessarily exclusively? If regulations that result in direct emissions reductions are more expensive than other forms of regulation, does ARB have discretion to rely on a mix of measures? If so, when and in what proportion? All of these questions remain open.

IV. SB 1383: California’s legislative approach to non-CO₂ climate pollutants

SB 1383, signed in September 2016, is California’s first legislation to specifically target short-lived climate pollutants and create numerical reduction targets for those pollutants. Short-lived climate pollutants (SLCPs) are certain chemicals other than carbon dioxide that have a greenhouse warming effect on the atmosphere, and include methane (CH₄), black carbon (soot), and numerous fluorinated gases (including HFCs). Although these pollutants enter the atmosphere at a much lower rate and stay there for a shorter time than CO₂, their warming effect is many times more powerful, sometimes by orders of magnitude. Emissions calculations indicate that cutting these powerful pollutants would be a major step toward reducing both short-term and long-term global temperature increase. The federal government had begun to address the dangers of SLCPs under President Obama, for example by restricting methane emissions from oil and gas operations on federal lands, but many of these policies may be weakened or

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₂⁰ AB 197, Sec. 5.
eliminated under the Trump Administration. With SB 1383, California stands to fill that leadership gap with an ambitious, though not un-criticized, approach to combat SLCPs.

The law includes four main substantive requirements. First, it sets numerical reduction targets for SLCP emissions and organic waste disposal. Second, it gives direction to the ARB to develop regulations to reduce methane emissions from dairy and livestock operations. Third, it gives direction to the California Energy Commission (CEC) and Public Utilities Commission (PUC) to develop recommendations for increasing the use of biogas in the state. Fourth, it requires the Department of Resources, Recycling, and Recovery to adopt regulations to achieve the organic waste reduction goals.

SB 1383 establishes specific reduction goals for the three most common short-lived climate pollutants, to be achieved by 2030: 40% reduction in methane emissions, 40% reduction in hydrofluorocarbon (HFCs) emissions, and 50% reduction in “anthropogenic” (i.e. non-wildfire) black carbon emissions.\(^2^2\) The limitation of the black carbon reduction goal to anthropogenic emissions is significant because black carbon emissions caused by wildfires make up two-thirds of the state’s yearly emissions, on average.\(^2^3\) ARB’s original SLCP Reduction Strategy did include black carbon from wildfires, but SB 1383 made that section moot by limiting the scope of the Strategy to anthropogenic emissions. It should be noted, however, that ARB will still address emissions from wildfires in its Forest Carbon Plan and in the 2017 Scoping Plan Update.\(^2^4\)

SB 1383 also creates goals for reducing organic waste in landfills, which produces methane emissions. It calls for a 50% reduction from 2014 levels in statewide disposal of organic waste by 2020, and a 75% reduction by 2025.\(^2^5\)

To further these goals, the legislation directs the ARB to approve and begin implementing by no later than 2018 the short-lived climate pollutant reduction strategy (“Strategy”) that ARB had proposed in April 2016.\(^2^6\) ARB must first ensure that the strategy is cost-effective and technically feasible. It must also “incorporate and prioritize” the co-benefits of job growth and local economic benefits, public health, and innovation in technology, energy, and resource management.

One of the most significant aspects of SB 1383 deals with the ARB’s regulation of the livestock and dairy sector, a sector that has not, historically, been a locus of ARB’s work. ARB must take a number of steps before adopting regulations to meet the goal of a 40% reduction in methane emissions by 2030. First, ARB must work with stakeholders “to identify and address technical, market, regulatory, and other challenges and barriers” to achieving the reduction

\(^2^2\) SB 1383, Sec. 2.
\(^2^5\) SB 1383, Sec. 3.
goals. Second, ARB must hold three public forums across the state, particularly in areas with significant dairy and livestock operations. And third, ARB must work with the Department of Food and Agriculture to research dairy methane emissions reduction methods.

The law also gives ARB a long timeframe for adopting regulations related to the livestock and dairy sectors. The law states that “the regulations adopted … shall be implemented on or after January 1, 2024, if the state board … determines” that the regulations are “technologically feasible,” “economically feasible,” “cost effective,” “include provisions to minimize and mitigate potential leakage,” and “include an evaluation of the achievements made by incentive-based programs.” In determining whether the regulations are “economically feasible,” the ARB must consider milk and cattle prices, the commitment of public and private funding, the existence of markets for products of manure management methods, and the state of electrical interconnection and access to common carrier pipelines for biomethane. Finally, the law also allows the ARB, in consultation with the Department of Food and Agriculture and stakeholders, “reduce the goal in the strategy for the dairy and livestock sectors” if it finds by July 1, 2020 that “[in]sufficient progress has been made to overcome technical and market barriers.”

SB 1383 also seeks to advance biomethane and biogas projects and infrastructure. The law requires that the ARB establish “energy infrastructure development and procurement policies needed to encourage dairy biomethane projects” by 2018. These policies must include a “pilot financial mechanism” to reduce the risk and uncertainty of the price of environmental credits, such as LCFS credits, which may be the main source of funds for biogas. Also by 2018, ARB must issue guidance on LCFS credits based on methane reductions and ensure that projects begun before this law receive credit. It also directs the CPUC to require gas corporations to initiate at least five dairy biomethane pilot projects that demonstrate interconnection with common carrier pipelines. This work could have positive implications for the development of a national biogas market, as it could prove profitability and offer technical and policy lessons. Other provisions relate to the integration of biogas into the energy system.

The last component of the law directs the Department of Resources Recycling and Recovery to issue regulations to achieve the organic waste reduction goals, to take effect after 2022. In addition to the absolute organic waste reduction goals, the law also establishes a goal of recovering for human consumption 20% of food currently going to landfills. It authorizes (but does not require) the Department to require certain actions from local jurisdictions, such as imposing penalties for non-compliance, and allows for creating different levels of requirements for different jurisdictions based on progress made. However, the law prohibits the Department from establishing individual-landfill scale limits on organic waste disposal. Finally, it empowers local jurisdictions to charge fees to recover any costs incurred. The food waste element of SB 1383 has received relatively little attention compared to the dairy regulations, yet the policy could significantly reduce the state’s methane emissions from the waste sector.

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27 SB 1383, Sec. 4.  
28 SB 1383, Sec. 4(b).  
29 SB 1383, Sec. 4(b).  
30 SB 1383, Sec. 4(d).  
31 SB 1383, Sec. 6.
Among the key interpretation and implementation questions raised by the bill are these:

- SB 1383 heavily emphasizes that any program to reduce methane from dairy and livestock operations must be cost-effective and feasible, but does not define these terms. What counts as “sufficient progress” in the context of overcoming technical and market barriers to scaling up biomethane, under Section 4(b)?

- In contrast to the numerous conditions and limitations imposed upon the ARB regarding regulation of the dairy and livestock sector, the law makes no reference to how ARB achieves the target reductions for non-methane SLCPs. What should ARB’s approach be to reducing HFCs and anthropogenic black carbon, and how broad are its powers to do so?

- All of these programs involve major financial investments from the state, but the future availability and size of proceeds from the state’s GHG cap-and-trade program are uncertain. What will the costs of these programs be, and how should we pay for them?

**Further Reading**

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