October 27, 2017

California Air Resources Board Staff

Cap and Trade Program

Via http://www.arb.ca.gov/cc/capandtrade/meetings/meetings.htm

CC: Mary Nichols, Chair, California Air Resources Board

## NextGen California's Comments on the October 12, 2017 Workshop on Next Steps for the Post-2020 Cap and Trade Regulation

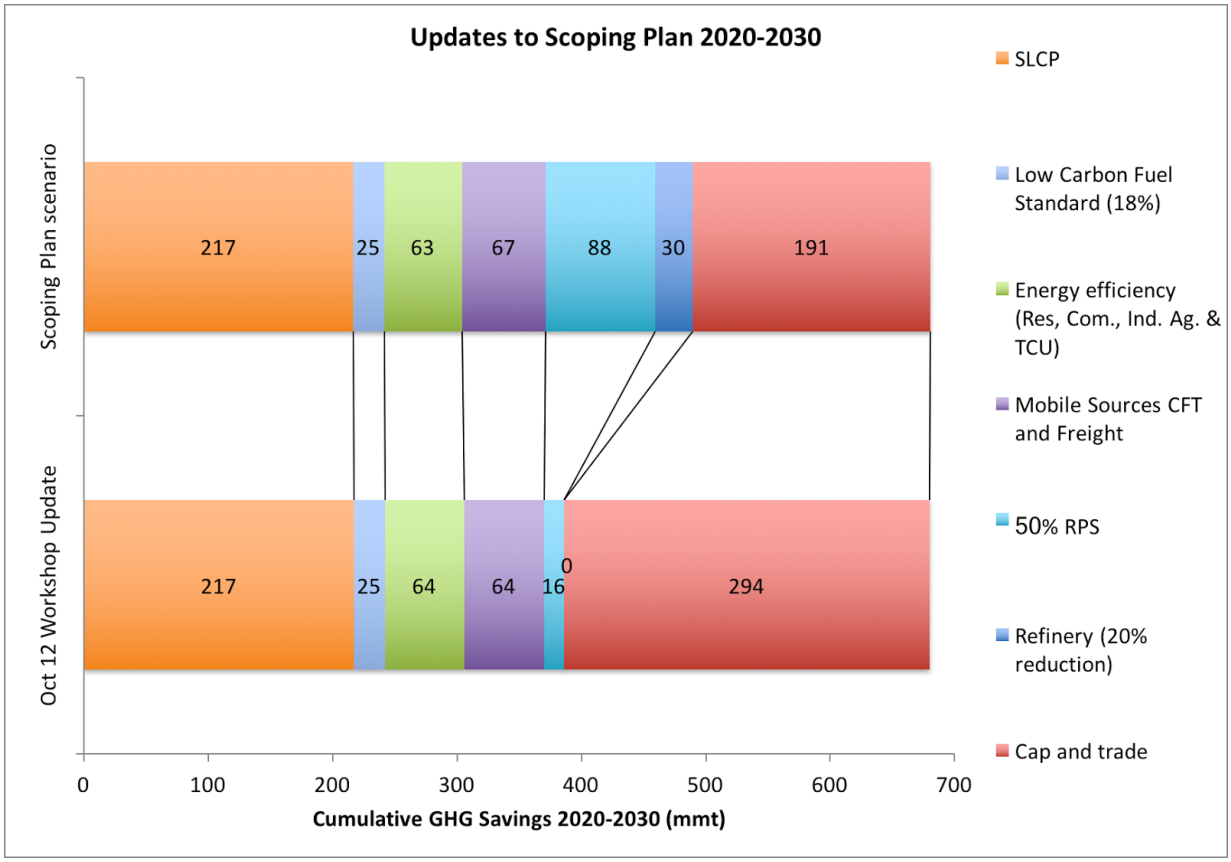
Thank you for the opportunity to provide informal comment on the October 12th presentation and discussion of next steps for the post-2020 cap and trade regulations. We appreciate your ongoing efforts to ensure that California's cap and trade program provides a model for the world to help achieve significant cost-effective greenhouse gas emissions reductions and drive needed investment in greenhouse gas abatement programs throughout the state, and particularly in disadvantaged communities.

As the California Air Resources Board (CARB) considers how best to implement AB 398 and achieve the greenhouse gas reduction targets required under SB 32 and AB 197, cap and trade program design considerations will be more important than ever. According to the updates to the scoping plan that CARB shared on the morning of October 12, 2017, CARB is contemplating a scoping plan under which the existing emissions-reducing policies that will contribute to meeting our 2030 carbon reduction targets will only drive 57% of projected cumulative emissions reductions with cap and trade driving the remaining 43% via the price signal it creates. As recently as March of this year, CARB expected these policies to provide 72% of reductions, and cap and trade to provide 28%.[1] (See Figure 1).

This shift means that the cap and trade program must drive 53% more reductions than CARB had previously expected unless additional technological breakthroughs, more aggressive complementary policies adopted via regulation or legislation, or other exogenous factors lead to significantly more reductions than are currently anticipated. In previous years, scoping plans anticipated that the carbon market would drive far fewer reductions both in absolute terms and as a proportion of all emissions reductions.

[1] Compare PATHWAYS Outputs, GHG Emissions by Measure, Scoping Plan Scenario, https://www.arb.ca.gov/cc/scopingplan/pathways_ghgs_by_measure_final_17jan2017.xlsx, to Slide 16, https://www.arb.ca.gov/cc/scopingplan/meetings/101217/sp-october-workshop-slides.pdf.

**Figure 1: Comparison of Cumulative Projected Emissions Reductions, March 2017 PATHWAYS Outputs vs. October 12 Scoping Plan Update Presentation**




These shifts come at a time when additional reductions from the electric sector, which has led emissions reductions to date, will begin to take on a diminishing role in California's overall greenhouse gas abatement efforts. Electricity sector emissions currently represent only about one fifth of statewide emissions. Even if this sector were to achieve carbon neutrality in 2030 (a significantly faster rate of decarbonization than is contemplated even by SB 100, which, if passed, would establish a 60% Renewable Energy target for 2030), it would only achieve about half of the required reductions. Other economic sectors, which have historically had more difficulty reducing emissions, must significantly accelerate their rate of decarbonization, and these reductions must be driven in substantial part by the carbon pricing mechanism in the cap and trade program.

At the same time, AB 398 limits some tools available to the state to help drive reductions in some of the sectors where it has been most difficult to make progress, by eliminating CARB's authority to directly regulate CO2 from refineries and by removing authority of Air Districts to adopt more stringent local and source-specific CO2 standards than CARB. AB 398 also requires CARB to maintain high Industry Assistance Factors for refineries and other heavy industrial emitters, which reduces the incentive cap and trade can provide for these sources to invest in technologies that will help them to reduce carbon emissions. These statutory changes place even more pressure on the cap and trade program to drive large emissions reductions from a shrinking pool of emissions, even as some sources are provided with counter-incentives that may tend towards slowing those same reductions.

It is therefore essential that CARB assess how updates to the cap and trade program are likely to affect economy-wide and sector-specific emissions prior to adopting new regulations. The following comments offer constructive suggestions for how CARB can help to ensure that the cap and trade program is as effective as possible as it takes on this difficult, but achievable task.

1. **CARB should adopt market rules that will help to ensure that the ambitious level of emissions reductions reflected in the scoping plan are actually achieved and that the State achieves both cumulative and annual emissions reductions in a manner that complies with SB 32 and AB 197**

SB 32 requires that CARB "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."[2] It is notable that this target sets a date certain by which the 40% emissions reduction must be achieved, rather than establishing a cumulative emissions limit. This date-specific target is consistent with the broader goal of California's climate policy: to move our state towards a clean economy that will be sustainable for many future generations. Achieving this goal requires substantially decarbonizing by mid-century and achieving at least the 80% reduction by 2050 specified in Executive Order B-30-15. The 2030 target marks progress along the way but simply meeting this target – or some proxy for it as expressed in a cumulative emissions inventory – does not constitute success; the State's emissions must be on a trajectory that maximizes the chance of achieving broad mid-century decarbonization. The current cap and trade market structure could allow real emissions to greatly exceed the SB 32 target even while the program is nominally meeting all of its own goals, through the use of allowances banked or held in reserve – of which there is a massive supply at present[3] – and offsets. Such an

[2] California Health and Safety Code § 38566.
[3] Legislative Analyst's Office, letter to Hon. Cristina Garcia, June 26, 2017. Attached.

outcome would dramatically increase the required rate of post-2030 emissions cuts, making attainment of critical mid-century goals much more difficult. To avoid this dangerous outcome, actual emissions in 2030 must be at or below SB 32 targets.

Merely identifying the remaining required reductions after existing complementary measures are fully achieved as work for cap and trade to do through "the magic of the marketplace" does not provide Californians with an adequate basis for assessing the efficacy of proposed market changes to achieve the substantial remaining reductions. Nor is this approach consistent with the spirit of AB 197, which requires that CARB's actions to reduce greenhouse gas emissions "be done in a manner that is transparent and accountable to the public and the Legislature" and CARB prioritize approaches "that result in direct emission reductions at large stationary sources of greenhouse gas emissions sources and direct emission reductions from mobile sources."[4]

When considering how best to implement cap and trade for 2020-2030, CARB should therefore analyze and publish one or more scenarios showing actual emissions by sector that comply with the SB32 target that could plausibly result from the combination of cap and trade and existing complementary measures. If CARB determines that additional complementary measure will be needed in order to ensure that cap and trade allowance prices remain within tolerable ranges, it should adopt those policies if it has authority to do so and identify needed policy changes that the legislature should consider.

*A. Clarify the Role of Offsets in how Cap and Trade Will Ensure Compliance with SB 32*

In providing the assessment of how, specifically, cap and trade will help to ensure compliance with SB 32 and AB 197, CARB should clarify its methodology for how it accounts for the effects of carbon offsets as an available compliance tool in the cap and trade system.

In 2030 sources covered by the cap may use offsets to satisfy 6% of their compliance obligation, at least half of which must provide benefits in California. Assuming that sources use the maximum number of offsets they are allowed to use, that means that their actual covered emissions are likely to be 6.4%, or 12.8 million tons above the nominal 2030 cap of 200.5 million tonnes. Even assuming that the offsets which provide benefits in

[4] AB 197 (2016) Findings and Declarations and California Health and Safety Code § 38562.5(a). I.e., if 6% of aggregate emissions are offset, to reach a nominal cap of 200.5 million tonnes, actual emissions will be 200.5/.94 = 213.3 million tons, 12.8 million tons above the nominal cap.

California result in emission reductions from uncapped sources in California and are reflected in the inventory, the use of out-of-state offsets will still result in additional emissions of up to 6.4 million tons within the capped sources in California, which will need to be compensated by making corresponding reductions from uncapped sources to comply with SB 32. CARB should clarify whether and how it intends to achieve any compensating reductions in uncapped sources within California's inventory.[5]

The 2015 inventory shows total emissions of 440.4 million tons, while the cap & trade allowance budget for 2015 was 394.5 million tons, and total covered emissions in 2015 reported to CARB amounted to 340.3 million tons.[6] This implies that uncapped sources in the inventory were responsible for 100.1 million tons in 2015. To compensate just for the out-of-state offsets allowed to be used in 2030 CARB would have to achieve additional reductions from uncapped sources equal to 6% of the emissions from these sources in 2015, over and above the measures currently included in the scoping plan. ARB should clarify how this is likely to occur, and whether adjustments to the cap and trade system will drive these additional reductions.

### *B. Price Containment Mechanisms Must Not Hamper Cap and Trade's Effectiveness*

As the cap and trade market takes on a leading role in driving over 40% of emissions reductions – more than any other single policy in ARB's scoping plan – it is essential that ARB design market rule in a manner that allows the market to function as a strong incentive to innovate and discover novel means of emissions reductions. This core function of the carbon allowance market cannot occur if price containment mechanisms hamper the market's price discovery function by setting an artificially low ceiling price or setting "speed bumps" or other price points that trigger release of reserve allowances too readily and too early in the program.

Price discovery is the inherent feature of a cap and trade system that allows it to drive cost effective emissions reductions in a dynamic technological and economic environment. If artificial breaks exist within the market that prevent allowances from reaching the price at which a marginal abatement technology becomes commercially viable, that technology will not become available. Conversely, if the technology does become available, it is likely to decline in price as competition, innovation, scale, and learning curves operate within

[5] For the purposes of this analysis we are assuming that all offsets which provide benefits within California result in additional emission reductions from uncapped sources within California and thus have no net impact on the emissions inventory. This is a best case scenario and CARB will need to monitor actual emissions and make adjustments as needed to ensure compliance with SB 32.

[6] https://www.arb.ca.gov/cc/inventory/data/data.htm; https://www.arb.ca.gov/regact/2016/capandtrade16/ctfinro.pdf at p. 114; https://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/2015-ghg-emissions-2016-11-04.xlsx sum of column R

that market segment. By allowing prices to naturally find the level of the needed abatement technology, long term carbon reductions become more cost effective. This means that providing too many price containment measures in the cap and trade system may have the perverse outcome of both delaying needed emissions reductions and of increasing longer term compliance costs by stymieing innovation and deployment of technological advancements.

ARB should carefully consider this dynamic when selecting a methodology for establishing price containment mechanisms, including the price ceiling and price containment points ("speed bumps") at which additional reserve allowances will be released. While preventing price spikes and preventing volatility are desirable considerations, there is significant risk in going too far to preemptively counteract these risks. A healthy market must be allowed to fluctuate within a reasonable range, must accommodate some tolerance for risk, and must, above all, be allowed to enable price discovery in the carbon abatement marketplace.

AB 398 provides no guidance to ARB regarding the appropriate price points for the required speed bumps. For this reason, ARB must look to the broader purpose of the cap and trade program: to provide a market based mechanism that allows for cost effective emissions reductions. In order to achieve this goal, the market must be allowed to function in a manner that enables price discovery for carbon abatement. For this reason, ARB should set the "speed bumps" at market prices that are relatively close to the price ceiling. If the market is flooded with allowances whenever prices begin to climb even a small amount above the reserve price, the price discovery function of the allowance market will be significantly frustrated. Price containment mechanisms should not be treated as a means of keeping prices artificially low. Rather, they should be treated as safety valves that will hopefully never be called upon – failsafes to ensure that we do not breach the price ceiling. In order to allow the market to cool off in this situation, without undermining the price discovery function of the market, ARB should set both speed bumps well above the median available market price. It would be unreasonable to set the speed bumps below the median price; a market that has not even reached a median within an acceptable range of prices cannot be said to be "overheating" in any way. CARB should evaluate levels such as 75%, 85% and 95% of the price ceiling as potential speed bump points.

In selecting a price ceiling calculation methodology, AB 398 provides somewhat more guidance. The statute directs CARB to consider among other factors, "the full social cost associated with emitting a metric ton of

greenhouse gases" and "the cost per metric ton of greenhouse gas emissions reductions to achieve the statewide emissions targets."[7]

The former condition provides some guidance as a starting point for assessing potential price ceilings. AB 197 defines the "social costs" of greenhouse gases 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."[8] These costs have been traditionally externalized by polluting entities in order to deflect the full cost of doing business onto citizens who do not benefit economically from the companies' increased profit margins. CARB should set a price floor that reflects a conservative estimate of these costs, and consider a price ceiling that is some multiple of the price floor and reflects a higher-impact estimate of the social costs of greenhouse gases.

Methodologies vary in assessing the social cost of greenhouse gases, but the United States Environmental Protection Agency, employing a highly conservative methodology that likely underestimates the full costs of carbon pollution, estimated a central range of $42 and $50 per tonne CO2e in 2020 and 2030, respectively, in 2007 dollars.[9] In 2017 dollars, these values would be $50 to $60. Low whole number multiples of these costs suggest that a price ceiling of $100 to $180 per tonne in today's dollars, adjusted annually for inflation, would not be disproportionate to the present and past damage carbon pollution imposes on society. These numbers are also consistent with EPA's higher impact estimate (95th percentile at 3% discount rate) of $123 and $152 per tonne in 2007 dollars.[10] CARB should consider the most recent best available science in estimating the social cost of carbon, and consider price ceilings that reflect a precautionary approach to the inherent uncertainty in estimating the damage caused by carbon pollution.

The latter condition, the cost of necessary abatement technology, is also difficult to predict with accuracy, in part because no jurisdiction has ever attempted to achieve emissions reductions at the scale and to the degree that California is attempting to drive through the 2020-2030 cap and trade system. Nevertheless, CARB should

[7] California Health and Safety Code § 38562(c)(2)(A)(i)(III) and (VI).
[8] California Health and Safety Code § 38506
[9] Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 (May 2013, Revised August 2015). This represents among the lowest reasonable estimates of the social cost of carbon. A 2016 study published in Nature Climate Change, for example, estimated the Social Cost of Carbon in 2015 to be $220 per tonne. Frances C. Moore and Delavane B. Diaz, "Temperature impacts on economic growth warrant stringent mitigation policy, " Nature Climate Change 5, 127–131 (2015), https://www.nature.com/nclimate/journal/v5/n2/full/nclimate2481.html.
[10] https://19january2017snapshot.epa.gov/climatechange/social-cost-carbon_.html

examine best available economic modeling and expert resources in attempting to assess what carbon price will be needed in order to enable the commercialization of technologies that will be required in order to reach our 2030 targets, and should provide a buffer above that level to take a conservative approach. If CARB sets the ceiling too low, we risk missing or delaying the opportunity to develop these technologies, which delays their development and cost reduction, which in turn will make reaching our ultimate decarbonization goals even more difficult.

C. *CARB Should Fully Utilize Available Authority to Ensure Emissions Reductions Occur at Major Stationary Sources and from Mobile Sources to Ensure Consistency with AB 197 Requirements.*

As the demands on the cap and trade market increase, it is vital the CARB use the full range of tools available to it to ensure that the market functions effectively and efficiently. This includes basing policies designed to reduce leakage, to the extent possible on sound scientific and economic bases, and maximizing the benefits of complementary policies such as the Low Carbon Fuel Standard.

a. <u>CARB should provide a sound and transparent basis for evaluating changes to policies to prevent leakage</u>

While AB 398 requires CARB to provide high Industrial Assistance Factors (IAF's) for certain industries, to the maximum extent possible, CARB should, to the extent it continues to provide free allowances as a means of reducing leakage, based these allocations on actual leakage risk. To the extent that CARB provides free allowance in excess of this level, both under current final regulations and in the post-2020 period, vital funds are diverted from emissions reduction programs supported by the GGRF, and directed instead to industrial emitters, who will have less incentive to invest in pollution reduction technologies in the near term. Polluters who receive excess free allowances may redirect those funds into banking additional allowances, further undermining the efficacy of the cap and trade market.

While CARB staff is required, under Board Resolution 17-21 to propose regulatory amendments to provide free allowances to industrial polluters "by using the same assistance factors in place for 2013 through 2017,"[11] the Board should be provided with sufficient context and information to evaluate the effects of and any need for this change to current final regulations, which were developed on the basis of significant research and public

[11] https://www.arb.ca.gov/regact/2016/capandtrade16/ctreso17-21.pdf, p. 14.

comment. If the change will provide preferential treatment for certain industries and divert needed funds from the GGRF, the Board should have a robust basis for weighing these tradeoffs against the potential leakage risk, if any, that is mitigated by this change to current regulations.

There is, as yet, no evidence in economic literature to support the idea that preventing leakage requires a 100% IAF in every at-risk industry. When presenting this potential regulatory amendment to the Board, CARB should:

- Evaluate actual leakage risk from maintaining current regulation setting third compliance period IAFs
- Evaluate what, if any leakage is mitigated by changing the existing regulation
- Recommend a research plan, to be carried out over the next few years, to better characterize and quantify leakage risk under the cap and trade program.
- Quantify the costs to California from lost GGRF revenues and the corresponding financial value of the additional allocation to industrial polluters that will benefit from the regulatory change
- Report these costs and changes, if any, to leakage risk to Board when responding to requirements of board resolution 17-21.

b. <u>CARB should adopt a LCFS carbon intensity target significantly higher than the proposed 18%</u>

The Low-Carbon Fuel Standard (LCFS) must set a more ambitious carbon intensity target than the 18% reduction indicated in the Staff Presentation related to the LCFS Draft Regulatory Text.[12] Existing evidence suggests there are likely to be ample supplies of fuel to support carbon intensity (CI) reduction targets well above 18%. Several independent research groups including the International Council on Clean Transportation,[13] ICF International,[14,15] Promotum,[16] and CARB itself[17] have evaluated low-carbon fuel supply and concluded that ample supply exists to support significant substitution of low-carbon

[12] https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/092217workshop_presentation.pdf Slide 19
[13] http://www.theicct.org/potential-low-carbon-fuel-supply-pacific-coast-region-north-america NextGen funded and contributed to this report.
[14] http://www.ucsusa.org/clean-vehicles/california-and-western-states/west-coast-oil
[15] http://www.caletc.com/wp-content/uploads/2016/08/Final-Report-Cap-and-Trade-LCFS.pdf
[16] https://www.nrdc.org/file/2547/download
[17] https://www.arb.ca.gov/newsrel/petroleum_reductions.pdf

alternatives for gasoline and diesel through 2030. A higher CI reduction target would directly reduce emissions by substituting lower-carbon options for high-carbon petroleum fuels, thereby mitigating some of the strain on the cap and trade system. In addition, the proposed LCFS amendments include new provisions relating to Refinery Investment Credits, Renewable Hydrogen Production, Co-Processing and Innovative Crude Production, these provisions incentivize efficiency improvements in the petroleum production and refining process that significantly reduce GHG and air pollutant emissions. The pollution reductions incentivized by these provisions could achieve many of the stationary-source pollution reduction goals set forth in AB 197. Prior to AB 398, it was intended that the Refinery Rule would achieve the intended reductions from refineries. CARB now lacks the authority to implement the Refinery Rule, but the LCFS program can create a strong incentive for significant reductions in air pollutant emissions from refineries through the Refinery Investment Credit, Renewable Hydrogen Credit, Co-Processing and Innovative Crude provisions in the LCFS. Increasing the CI target strengthens the incentive for refiners to make these investments by sending a strong market signal and maximizing the value of LCFS credits generated by these projects.

2. **CARB should address market overallocation and adjust banking rules per AB 398 requirements in order to ensure the cap and trade program operates effectively to help California meet the 2030 emissions reduction targets and 2050 goals**

The cap and trade allowance market is currently significantly overallocated, putting both the efficacy of the cap and trade market and the ability of this market to help us meet our 2030 emissions target and 2050 goals at risk. Overallocation, combined with the ability for market participants to bank allowances for an unlimited period creates a strong incentive for market participants and financial speculators to buy unneeded allowances up to the holding limit at today's low market price. In principle, the requirement to purchase allowances should present polluters with a choice: invest in emissions reductions or, if these investments are more expensive than the market price for allowances, purchase allowances instead. As the cap declines and allowance prices rise, more firms should opt to invest in pollution reductions rather than continue to pollute. But in an overallocated market with no limitation on the future compliance value of banked allowances, firms can continue to pollute at current levels and purchase low cost excess allowances as a hedge against future price increases. In this way, a firm could lock in higher levels of pollution with no risk of facing high compliance costs as the market tightens. When this behavior is aggregated across the market, it can have the effect that, in early years, more allowances are purchased than are surrendered, and in later years, more allowances are surrendered than

purchased. As a result, emissions decline less than the amount by which the cap declines, and the market risks significantly underperforming in later years, which will make it more difficult to achieve the 2030 emissions reduction target. The fact that in this scenario firms delay investments in pollution reduction also means that achieving deeper reductions after 2030 will be even more difficult.

At a time when we are calling on the cap and trade market to do more work than ever to drive emissions reductions, the carbon market must not operate with one arm tied behind its back. CARB should therefore evaluate and implement policy adjustments to eliminate the current overallocation and to limit purely financial speculation in the cap and trade market that hampers the market's ability to drive genuine technological and operational changes that reduce emissions.

*A. CARB Should take steps to address overallocation in the cap and trade market*

To address the oversupply, CARB should consider options for implementing a cap adjustment that will eliminate the overallocation in the market. The Legislative Analyst's Office estimated in June, 2017 that "the cumulative oversupply of allowances in California's cap and trade program through 2020 could range from 100 million to 300 million allowances, with it most likely being roughly in the middle of that range." They go on to note that if these oversupplied allowances are allowed to carry over for compliance in the 2020-2030 period, it "makes the post-2020 program less stringent, which potentially increases emissions. . . ."[18] At the high end of this range, banked allowances purchased from the current overallocation could substitute for the full 294 million tonnes reduction the scoping plan requires the cap and trade program to produce. If these levels of allowances are banked and only spent in the out years of the program, it could allow obligated parties within the cap and trade market to hold actual emissions steady at higher levels while still nominally meeting their reduction targets. The result of this would be a system that, in 2030, complied with cap and trade market program requirements but left emissions in capped sectors above the cap. CARB can address this problem in part by removing the excess allowances from circulation through one or more cap adjustments, commencing as soon as possible.

AB 398 requires CARB to "Evaluate and address concerns related to overallocation in the state board's determination of the number of available allowances for years 2021 to 2030, inclusive, as appropriate," and to

[18] Legislative Analyst's Office, letter to Hon. Cristina Garcia, June 26, 2017. Attached.

"Establish allowance banking rules that discourage speculation."[19] To comply with these provisions and to ensure that the cap and trade market functions effectively to drive needed levels of emissions reductions, CARB should take steps to prevent current overallocated allowances from allowing real emissions to exceed SB 32 targets and to ensure that California is on a trajectory which maximizes the chance of achieving mid-century decarbonization goals such as the 80% target put forth by Executive Order B-30-15.

To mitigate this risk, CARB should adopt policies that reduce the reserve of excess credits currently available to be banked or otherwise carried over into the late 2020's. We strongly recommend the following steps.

1. CARB should quantify the oversupply of allowances at the end of the 2018-2021 compliance period, including permits held in the auction account, APCR and entity holding accounts.
2. CARB should set a schedule for drawing down the oversupply of allowances which ensures that real emissions from capped sectors decline sufficiently for the state to meet SB 32 goals and be on a trajectory which maximizes the chance to achieve mid-century decarbonization targets including Executive Order B-30-15.
3. CARB should evaluate and take steps to draw down the over-supply including, but not limited to:
    a. Reducing the GHG allowance budget by an amount which yields a cumulative reduction equal to the total oversupply
    b. Decreasing the value of allowances held in the auction account, APCR, holding accounts or other accounts over time to erode the cumulative value of banked allowances until the over-supply has been reduced to zero
    c. Retiring allowances in the holding account and/or APCR
4. CARB should periodically review the total oversupply of allowances at the end of each compliance period to determine whether it is decreasing at the rate specified in the schedule. If not, CARB should take additional steps, such as those described in part 3 above, to ensure that the cap and trade market provides real reductions in line with SB 32 targets. CARB should identify the mechanisms it will employ to make these adjustments during this rulemaking process in order to send as consistent a signal to the market as possible.

We recognize that it is difficult to design a market which can tolerate all possible sets of market conditions, participant behavior and technological development. The oversupply of allowances from 2012-2020 is a prime example of this; the effect of the recession, coupled with unexpectedly rapid development of emission-reducing

[19] California Health and Safety Code § 38562(c)(2)(D) and (H).

technologies led to an emissions trajectory far below most reasonable projections. The presence of the allowance oversupply complicates the task of designing the post-2020 market. Rather than risk another inaccurate projection of allowance supply or demand, CARB should set a clear target for addressing this issue and build in predictable review and revision opportunities, to allow incremental course corrections during the 2020-2030 time period. Regular reviews and corrections minimize the risk that unexpected exogenous factors lead to another mismatch between permit supply and demand and ensure that market signals are transparent and consistent, even if mid-course corrections to permit supply or allowance target levels are required.

*B. Banking and holding rules should allow obligated parties to manage risk, but not offer windfall profit opportunities to speculators or substitute for real emissions reductions.*

The negative effects of overallocation are magnified by current banking rules, which allow market participants to hold allowances across compliance periods. Because prices are currently near the reserve price, which increases five percent annually plus an adjustment for inflation, the purchase of cap and trade allowances at today's prices offers investors bond-like certainty of stock-like returns, or potentially much, much more if prices rise significantly.

Allowance banking should be available for the purposes of encouraging early action to reduce emissions, and to allow flexibility for firms that cannot precisely predict emissions over time. It should not serve to create a windfall financial instrument for third party traders with access to capital and no compliance obligation or interest in achieving the 2030 emissions reduction targets.

CARB should assess options for reducing the incentive to treat cap and trade allowances as merely high-yield/low-risk financial instruments. Among other options, CARB should consider shortening the period during which banked allowances may ultimately be surrendered or forbidding the banking of allowances across three-year compliance periods. If allowances are purchased at the end of the surrender period, CARB should consider a system under which unused allowances can be returned and their purchase price credited towards allowances purchased in the next period. CARB should also consider adjusting allowances' compliance value over time to reflect changes in the reserve price and/or cap decline rates. Banked allowances' compliance value may be adjusted to reflect their relative value against a shrinking cap. One way to accomplish this would be to treat banked allowances as a deposit against future allowance purchases' reserve price plus the dollar amount above the reserve price at which the banked allowance was purchased, but requiring the party surrendering the

banked allowance to make up the difference between the clearing price and the reserve price in the surrender year. Another option is to adjust the compliance value of banked allowances by an amount proportionate to the increased cap stringency and increased reserve price. For example, under a simplified formula, if 100 allowances are purchased in year x at a reserve price of $15, if the reserve price rises to $30 in year y, the 100 banked allowances may be surrendered for a compliance value of 50 tons. CARB should evaluate these and other variations on banked allowance value adjustments to ensure that banking can continue to serve its intended purpose to encourage early action and allow compliance flexibility, without encouraging financial speculation in the cap and trade market, and to fulfill the requirements of AB 398.

### 3. Offsets

Covered sources under the cap and trade program may use offsets to satisfy part of their compliance obligations with offset credits, provided that they represent emission reductions that are real, permanent, quantifiable, verifiable, enforceable, and additional.[20] AB 398 establishes a Compliance Offsets Protocol Task Force and further restricts the use of offsets for compliance purposes to no more than 4 percent of each covered entity's compliance obligation from 2021 through 2025 and no more than 6 percent from 2026 through 2030, of which no more than one-half may be sourced from projects that do not provide environmental benefits in the state. The offset provisions adopted in AB 398 reflect concern by the Legislature that the use of offsets could dilute or undermine the benefits of cap and trade in California, particularly in disadvantaged communities. CARB should respond to these concerns not simply by applying the mandated numerical limits, but also by reexamining its offset protocols to increase confidence that offsets are indeed producing benefits to California, and in particular that offset credits represent greenhouse gas emission reductions from uncapped sources that are additional to any that would occur in the absence of the offsets program.

At the October 12th workshop, some members of staff and the public expressed confusion as to whether the subset of offsets that provide direct environmental benefits to California must be produced by projects within the state of California. These projects should occur within the state of California or, at minimum, prevent direct effluent pollution to California waters. All offsets must produce real, permanent, verifiable, and additional greenhouse gas emissions reductions. For the distinction of some offsets as having direct environmental benefits to the state to have any meaning, these direct benefits must be over and above any indirect benefits

[20] Health and Safety Code §38562(d)(1) and (2)

attributable to the offset projects' greenhouse gas mitigation. It is our position that this designation in no way violates the Commerce Clause of the federal Constitution, but if CARB is concerned about this issue, it should seek clarification from the California Department of Justice through an Attorney General's Opinion, rather than prejudging the issue by foreclosing the possibility that these offsets be designated specifically for projects that occur within California.

CARB should establish the Compliance Offsets Protocol Task force as soon as possible and include experts who have issued well-reasoned criticisms of CARB's offset rules. In consultation with the Task Force, CARB should reexamine its existing offset protocols as well as consider establishing new ones, and ensure that all offset protocols include conservative benchmarks for assessing additionality. Such benchmarks must represent environmental performance that is well beyond median or average practice in the relevant sectors. Even performance that is one standard deviation better than the mean implies that 16 percent of projects within that sector would exceed that performance level in the absence of an offset program. This means that such a benchmark could simply select business-as-usual, better-than-average performance projects and that all of the awarded offset credits could be non-additional. CARB can mitigate this risk be setting benchmarks that reflect genuinely extraordinary performance (e.g. two standard deviations above the mean) and applying appropriate discount factors for uncertainty. Protocols for carbon sequestration projects should also include reserves and/or discounts that appropriately reflect the risk that sequestered carbon will be lost to natural or man-made phenomenon. Finally, offset protocols should reflect sustainability criteria that prevent environmental harm.

**Conclusion**

California's cap and trade system has been the foundation of its global leadership in climate policy for the last decade. CARB now has the opportunity, and the responsibility, to ensure that it can continue in this role for the next decade and beyond. We appreciate CARB Staff's willingness to engage with all stakeholders as we develop rules for the 2020-2030 market and look forward to constructive engagement as this process moves forward.

Sincerely,

Dan Lashof,
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David Weiskopf,
Policy Development Manager

Colin Murphy,
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LAO

June 26, 2017

Hon. Cristina Garcia
Assembly Member, 58th District
Room 2013, State Capitol
Sacramento, California 95814

Dear Assembly Member Garcia:

You recently asked our office to provide various analyses related to an oversupply of allowances in the state's cap-and-trade program. Specifically, in this letter, we:

- Estimate the range of the cumulative allowance oversupply in the cap-and-trade program through 2020.
- Assess the impact of allowing this oversupply to carry over into a post-2020 program on (1) future greenhouse gas (GHG) emissions and (2) near- and long-term allowance prices.
- Assess the impact of alternative approaches to addressing the oversupply of allowances and the connection between the current program and a post-2020 program.

Below, we provide some brief background on the ability to use allowances issued in earlier years to comply in later years (commonly referred to as "banking"), as well as discuss the oversupply issues identified above. As you are aware, these are complex issues, and there is substantial uncertainty about the future business-as-usual scenario, as well as impacts under different alternatives. Throughout our analysis, we describe some of the key areas of uncertainty, our assumptions, and/or potential limitations of our analysis. For example, our analysis of the oversupply of allowances focuses on California and does not include current (Quebec) or potential (Ontario) linked jurisdictions. Emissions and allowances in California make up the large majority (about 85 percent) of the current market, so our analysis likely provides a general sense of the magnitude of the oversupply and the basic issues and tradeoffs associated with different policy options. However, to the extent there is a significant imbalance between supply and demand for allowances in linked jurisdictions, it could have a significant effect on the analysis provided below.

***LAO Bottom-Line.*** We estimate that the cumulative oversupply of allowances in California's cap-and-trade program through 2020 could range from 100 million to 300 million allowances, with it most likely being roughly in the middle of that range. Relative to a scenario where this oversupply is not available for compliance in a post-2020 program, the oversupply makes the post-2020 program less stringent, which potentially increases emissions and puts downward pressure on prices. The ultimate magnitude of this effect would largely depend on future emissions scenarios,

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which are subject to considerable uncertainty. In a scenario where there is otherwise a low demand for allowances, there would be a cumulative oversupply of allowances of about 150 million tons through 2030 and allowance prices could remain relatively low. In contrast, under a high demand scenario, the program would encourage a substantial number of GHG reductions from covered entities and allowance prices would likely be substantially higher than they are now. There are a variety of alternative program designs that could affect the oversupply—each of which has tradeoffs related to future emissions and near- and-long term prices.

## Background

***Current Program Allows Banking.*** The current cap-and-trade program allows banking. For example, a covered entity can use a 2016 vintage allowance to comply in 2020. Under certain conditions, banking does not change the *cumulative* level of emissions over the course of the entire period. However, it can change when emissions (and emission reductions) occur. Since the cap on emissions becomes more stringent in later years, banking gives firms an incentive to obtain extra allowances in early years as a way to protect against the risk of higher prices in later years when allowances are more scarce.

Relative to a program without it, banking has the effect of increasing allowance prices (and incentives for reductions) in early years, while reducing prices (and incentives for reductions) in later years. Some of the primary advantages of banking include (1) less short- and long-term price volatility and (2) incentivizing lower cost emission reduction activities in early years. However, one potential downside associated with banking is that it increases the risk that an *annual* emissions target in later years is not met because entities can comply in the later years by using banked allowances, rather than reducing emissions.

***Cap-and-Trade and Emissions Certainty.*** Relative to other GHG reduction strategies, cap-and-trade can provide greater emissions certainty because the state controls the cumulative number of allowances issued. However, there are limitations to the amount of emissions certainty that the current cap-and-trade program provides—particularly as it relates to meeting an *annual* state emissions target, such as the 2030 GHG target established by SB 32. For example, as discussed above, allowing a significant amount of banking increases the risk that a future annual emissions target is not met. Furthermore, offsets that reduce emissions in other states can be used to comply with the cap-and-trade program, but these reductions are not currently counted in the *state* GHG inventory that is used to assess the state's progress toward meeting its GHG goals. Thus, while offsets might be a cost-effective way to reduce GHGs in other jurisdictions, they do not help keep GHG emissions from within the state below the limits established in law.

## California Oversupply Likely 100 Million to 300 Million Metric Tons Through 2020

An *annual* oversupply occurs when the total number of allowances issued in a given year is greater than the number of allowances covered entities need to comply. This would result in allowances going unsold and/or being banked by private entities. There was an oversupply of allowances in the first three years of the program for which data is available (2013 through 2015) and there will very likely be an annual oversupply of allowances for the next few years of the program. In addition, since banking is allowed, there will very likely be a *cumulative* oversupply

of allowances that builds up through the first several years of the program. Under various assumptions about factors that affect the demand for allowances (specifically, future annual emissions that would occur even in the absence of cap-and-trade and the number of offsets used), we estimate that the oversupply of allowances in California's cap-and-trade program through 2020 could range from 100 million to 300 million allowances, with it most likely being roughly in the middle of that range. This is roughly the same magnitude of oversupply projected from other researchers and market participants. Again, these estimates do not include the supply and demand for allowances from current (Quebec) or potential (Ontario) linked jurisdictions. Including these other jurisdictions could either increase or decrease the estimate of oversupply. In addition, this estimate does not include the roughly 121 million allowances that are available in the Allowance Price Containment Reserve. (Four percent of allowances are placed in the Allowance Price Containment Reserve and made available at predetermined prices—a strategy intended to moderate potential spikes in allowance prices.)

## Allowing Use of Oversupply Post-2020 Reduces Prices and Increases Emissions

We assessed the impact of allowing this oversupply to be used for compliance in the post-2020 program. For the purpose of this analysis, we assume the state (1) allows banking from the current program to the post-2020 program and (2) makes no adjustment to the amount of allowances that are available to decrease the oversupply. Below, we discuss how such an approach could affect emissions and allowance prices given the magnitude of the oversupply and potential scenarios affecting the demand for those allowances. We then discuss how alternative design options that reduce the ability to bank allowances or affect the magnitude of the oversupply could affect emissions and prices.

***Makes Post-2020 Program Less Stringent and Reduces Allowance Prices.*** Relative to a scenario where there is no oversupply carried into a post-2020 program (either by limiting banking or removing the oversupply from the market), allowing some or all of the oversupply carry forward effectively makes the program less stringent. This is because it would increase the total supply of allowances in the post-2020 period, and companies could emit more than the post-2020 caps established by the Air Resources Board (ARB). Therefore, a policy to allow the oversupply to carry over would allow more *cumulative* emissions over the post-2020 period. It also makes it less likely that the state would meet its 2030 *annual* emissions target.

This increase in allowance supply in a post-2020 program also would affect allowance prices both in the near and long term. Higher supply of allowances could lead to lower near- and long-term allowance prices. Since some models predict that allowance prices are likely to be either near the price floor or price ceiling, the oversupply could simply increase the likelihood of prices being at the floor and decrease the likelihood of prices being at the ceiling.

***Magnitude of Effects Depends on Future Emissions Scenarios.*** While we would expect that making an additional supply of allowances available post-2020 generally would reduce program stringency and allowance prices, the magnitude of these effects would depend in large part on the demand for allowances, as described below. Consequently, we assessed the difference between supply and demand for allowances through 2030 under two different demand scenarios. (We

assume the supply of allowances is the amount of allowances ARB currently plans to issue through 2030, including the pre-2020 oversupply discussed above, minus the allowances that are expected to be in the Allowance Price Containment Reserve [APCR].) The two scenarios are:

- ***Low Demand Scenario.*** In this scenario, we estimated the demand for allowances assuming that future emissions without the cap-and-trade program would decline significantly, in large part driven by various other GHG reductions policies, consistent with ARB's Scoping Plan emissions projections. We also assume that the percent of total statewide emissions from capped sources remains constant at 78 percent, and offsets are used to cover about 5 percent (250 million tons) of cumulative compliance obligations.
- ***High Demand Scenario.*** Under this scenario, we assumed future emissions without the cap-and-trade program remain flat through the entire period. The comparatively higher emissions could be driven by such things as higher-than-expected economic growth and/or other state GHG policies achieving less reductions than expected. We also assume offsets are used to cover only about 3 percent (176 million tons) of cumulative compliance.

While these scenarios reflect relatively low and high demand for allowances, it is possible that actual demand for allowances could be higher or lower.

***Lower Demand Could Result in Cumulative Oversupply of Allowances Through 2030.*** Figures 1 (see page 6) shows the cumulative oversupply of allowances through 2030 under both scenarios. In the low demand scenario, there would be a cumulative oversupply of allowances of about 150 million tons through 2030. As shown in Figure 2 (see page 6), this means that the cap itself would not drive any reductions in emissions from covered entities. Instead, the GHG reductions from cap-and-trade would come from offsets (about 250 million tons) and whatever reductions are incentivized by the allowance floor price. In contrast, under a high demand scenario where business as usual emissions are high and offset supply is lower, the cap would be needed to encourage about 600 million tons of cumulative GHG reductions from covered entities, in addition to 176 million tons of reductions from offsets. Under this scenario, allowance prices would likely be substantially higher.

## Alternative Approaches Have Tradeoffs

We assessed alternative program designs that could affect the oversupply and how those alternatives would affect emissions and prices. Since there are a number of potential alternatives, we have summarized them in Figure 3 (see page 7). Specifically, the figure describes some options that would reduce the degree to which an oversupply would be carried into a post-2020 program, as well as one option that has been discussed that would increase the magnitude of the oversupply that is carried forward. In general, these options fall into one of two categories: (1) strategies that affect the ability to bank allowances and (2) strategies that affect the amount of the oversupply. We also provide a general description of how each option could affect prices and emissions compared to a baseline case where banking is allowed and all of the oversupply is made available in the post-2020 period. These options likely would have different effects on near- and

long-term prices and emission levels. While we describe the potential effects of each approach, the actual effects would depend on a variety of factors, including emissions and allowance prices that would occur without these changes, as well as certain programmatic design features. For example, the effects of each of these policies on prices and emissions might depend on whether market prices are at the floor or the ceiling, and whether there is a hard price ceiling.

If you have further questions, please contact Ross Brown at 319-8345 or Ross.Brown@lao.ca.gov.

Sincerely,

Anthony M. Gilb

for Mac Taylor
Legislative Analyst

**Figure 1**

**Cumulative Allowance Oversupply Under Different Scenarios**

*In Millions of Allowances*

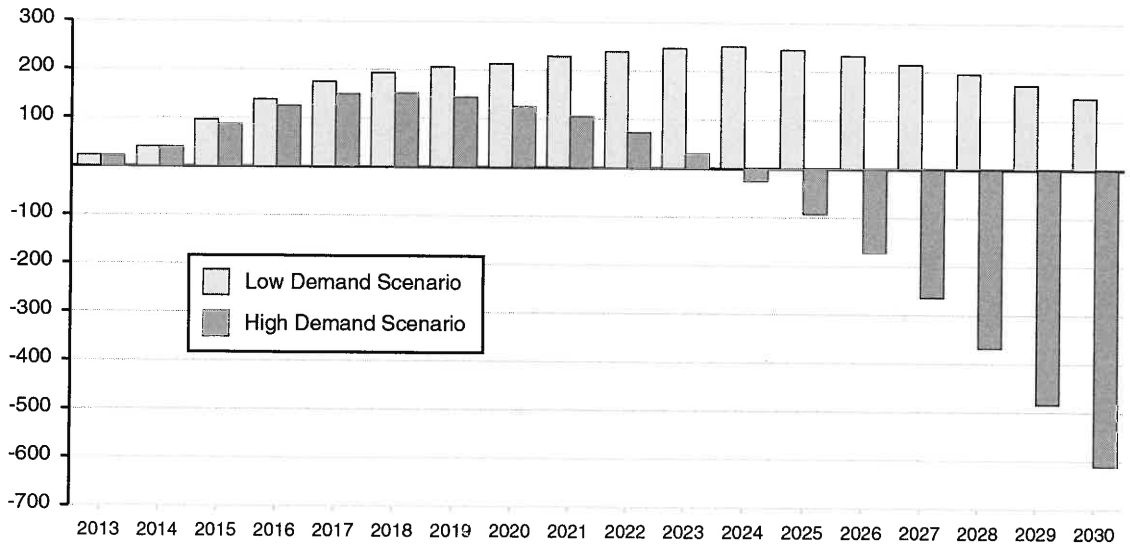


**Figure 2**

**Cumulative GHG Reductions From Cap-and-Trade Through 2030 Under Different Scenarios**

*(In Million Metric Tons)*

| | Low Demand Scenario | High Demand Scenario |
|---|---|---|
| Reductions from covered entities driven by cap | —[a] | 621 |
| Offset reductions | 250 | 176 |

[a] Since there is a cumulative oversupply of allowances, the cap itself is not driving emission reductions. However, there would be some emission reductions driven by a minimum allowance price.

GHG = greenhouse gas.

**Figure 3**

**Potential Effects of Options to Address Oversupply**

*Baseline: Allowing Oversupply to Carryover Into Post-2020 Period at Regular Auctions (and No Adjustments to Future Caps)*

| Alternatives | Effect on Prices | Effect on Emissions |
|---|---|---|
| No banking | Lower near-term prices because current allowances cannot be used to comply when cap becomes more stringent. | Higher near-term emissions because lower allowance prices. |
| | Higher long-term prices because banked allowances not available in future years. | Lower emissions in later years because higher prices. |
| | Potentially increases price volatility. | |
| Limited banking (for example, banking allowed for five years) | Lower near-term prices because current allowances cannot be used to comply when cap more stringent in future years. | Higher emissions in near-term because lower prices. |
| | Higher long-term prices because fewer banked allowances will be available for compliance in later years. | Lower emissions in later years because higher prices. |
| | Effect on prices would likely be less severe than the "no banking" option. | Effect on emissions would likely be less severe than the "no banking" option. |
| | Potentially increases price volatility. | |
| Reduce the number of allowances available by retiring unsold allowances and/or reducing number of allowances issued in future years. | Higher near-term and long-term prices because overall supply of allowances is reduced. | Lower near-term and long-term emissions because prices are higher. |
| Make oversupply available only at specified prices ("speed bumps," for example) | Higher near-term and long-term prices if prices would otherwise be below speed bumps. | Lower near-term and long-term emissions if prices are higher. |
| | Effect on prices might be less severe than removing allowances from market entirely. | Effect on emissions might be less severe than removing allowances from market entirely. |
| | Potentially decreases price volatility. | |
| Make current APCR allowances available at lower prices (such as offering at regular auction or at "speed bumps") | Lower near-term and long-term prices if prices would otherwise be below the APCR prices. | Higher near-term and long-term emissions if prices are lower. |
| | Potentially decreases price volatility. | |

APCR = Allowance Price Containment Reserve.