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Ensuring Maximum Greenhouse Gas Reductions are Achieved Pursuant to AB 32 (Chapter 488, Statutes of 2006)

Overview

AB 32 requires California's Air Resources Board to adopt regulations that will at least reduce statewide greenhouse gas (GHG) emissions to the 1990 level by the year 2020 and, beyond that emissions limit, AB 32 further requires ARB to seek maximum reduction of GHG emissions to the extent that such additional reductions are technologically feasible and cost-effective. The latter requirement reflects a recognition that the 2020 limit does not represent a safe and adequate emission level sufficient to avoid the "serious threat" of global warming, and that there may be potential near-term opportunities for cost-effective emission reductions beyond the 2020 limit. For example, solar power may reach grid parity within eight years, and hybrid vehicle production costs could fall by a factor of three over the next decade. Regulatory incentives to fully exploit such technologies would be responsive to the statutory requirements for maximum emission reductions and early action, and could significantly reduce the cost of post-2020 action.

The maximum-reduction requirement is clearly articulated in Sec. 38560 of AB 32:

The state board shall adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources or categories of sources, subject to the criteria and schedules set forth in this part.

However, this requirement has not been given effect in ARB's recently-approved framework for implementing AB 32 known as the "Scoping Plan." ARB's inattentiveness to Sec. 38560 appears to result from some misconceptions and confusion about what the statute means and how its provisions interrelate. In particular:

(1) ARB staff apparently accept the view that the term "cost-effective" means "least-cost," and that significant emissions reductions beyond those necessary to stay within the 2020 limit would, by definition, not be cost-effective if they would increase costs. But in the context of Sec. 38560 it is clear that cost effectiveness is a threshold condition subject to which emission reductions, not cost reductions, are to be maximized.

(2) ARB may perceive the emission-minimization objective of Sec. 38560 as conflicting with the cost-minimization goal of Sec. 38562(n)(1) (“Design the regulations ... in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California ...”) But early action could avoid potentially much greater costs of delayed action, and Sec. 38560 could be instrumental in reducing California’s long-term costs. A self-consistent reading of AB 32 requires consideration of long-term costs.

(3) ARB may believe that more stringent targets may not be practicable or justifiable, or legally defensible. However, Sec. 38560 does not necessarily require more stringent emission targets. Incentive policies (such as a price floor for auctioned allowances or feebates¹ for new vehicle purchases) could be more effective at exploiting the untapped (and unpredictable) market potential for further emission reductions.

In view of the Scoping Plan’s neglect of Sec. 38560, guidance is required at this stage to ensure that the Legislature’s clearly expressed intent in AB 32 is fully reflected in regulations to be adopted in the next two years, and that those regulations are legally defensible. To this end, the following amendments are proposed to clarify the intended meaning of “cost-effective,” to make explicit ARB’s authority to consider post-2020 emission reduction goals in evaluating costs and cost-effectiveness, and to establish a self-consistent framework for statutory construction that accommodates the combined requirements for the 2020 limit, maximum reduction, cost effectiveness, cost minimization, and early action.

Following the proposed amendments, this memorandum provides a more detailed discussion of the policy motivation, implications, and legislative policy rationale for the proposal.

Proposed amendments to AB 32

Item 1:

38505(d) “Cost-effective” or “cost-effectiveness” means the cost per unit of reduced emissions of greenhouse gases adjusted for its global warming potential.

Proposed revision:

¹ See “Potential Design, Implementation, and Benefits of a Feebate Program for New Passenger Vehicles in California,” <http://www.arb.ca.gov/research/econprog/feebates/feebates.htm>

“Cost-effective” or “cost-effectiveness” means **not exceeding a threshold** cost per unit of reduced emissions of greenhouse gases adjusted for its global warming potential.

Item 2:

38562(b)(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, and encourages early action to reduce greenhouse gas emissions.

Proposed revision:

38562(b)(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, and encourages early action to reduce greenhouse gas emissions, **taking into consideration emission reduction goals beyond 2020.**

Item 3:

38560. The state board shall adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources or categories of sources, subject to the criteria and schedules set forth in this part.

Proposed revision:

38560 **(a)**. The state board shall adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources or categories of sources, subject to the criteria and schedules set forth in this part.

(b) Pursuant to this section, the Board shall adopt and apply a cost-effectiveness criterion or criteria according to Sec. 38505(d) and subject to the following conditions and limitations:

(1) The cost-effectiveness criteria may reflect ancillary policy considerations, such as co-benefits of energy diversity and public health, and based on such considerations the cost-effectiveness threshold may potentially differ between sources or categories of sources.

(2) The cost-effectiveness criteria shall, at a minimum, admit any policy measure that would achieve significant emission reductions with no marginal net economic cost to California, and the criteria may impose positive costs associated with emission reductions. The criteria shall be applied in a manner that seeks to avoid any unjustifiably inequitable distribution of economic costs and benefits.

(3) The cost-effectiveness criteria shall, at a minimum, enable Board adoption of rules and regulations that achieve the statewide greenhouse gas emissions limit, but the criteria shall not be defined to preclude emission reductions significantly beyond that limit. Any conflict between the Board's cost-effectiveness criteria and the statewide greenhouse gas emissions limit shall be resolved in favor of the latter.

Motivation

ARB's Scoping Plan for AB 32 implementation² is deficient in the following specific respect: The qualifier "maximum" in Sec. 38560, which applies to emission reductions, has not influenced the choice or design of policy instruments, or the emission reductions that would be achieved under the Plan. Moreover, ARB has not communicated recognition that the qualifier represents a statutory requirement separate from and additional to the 2020 limit, or that it has any operative meaning in relation to emission reductions.

The Scoping Plan recites the Sec. 38560 language in the introductory paragraph of Section III ("EVALUATIONS," page 73). Sub-section III.C ("Cost-Effectiveness," page 84) states that "cost-effectiveness is an important requirement to be considered in the design and implementation of emission reduction strategies," and it notes that AB 32 "does not provide criteria to assess if a regulation is or is not cost-effective." ARB evidently has authority under AB 32 to define such criteria, but has not done so in the Scoping Plan. The Plan describes a cost-effectiveness "approach," which appears to be entirely discretionary and unconstrained by statutory requirements.

While the Scoping Plan does not provide an explicit definition of ARB's cost-effectiveness criteria, in light of the Scoping Plan's adoption of what it terms the 2020 "target" and its failure to respond to the statute's maximum reductions mandate³, it is clear that ARB has adopted the conventional academic treatment of cost-effectiveness – namely that "cost-effective" means "least-cost." In this, ARB appears to have adopted the definition that was expressly advanced by Professor Jim Sweeney at the June 3, 2008 AB 32 Economic Analysis Technical Stakeholder Work Group Meeting on cost effectiveness:

Cost-effectiveness

*A set of greenhouse gas mitigation measures is **cost-effective** under a given target emission reduction if and only if the set of measures together imposes the minimum cost to society (among all feasible measures) of meeting the target emission reduction*

- This is defined in relation to a particular target
- We are referring to the social cost here

² <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

³ The summary of statutory requirements in Section I.B.2, pages 5-6 makes ambiguous references to the "2020 limit" and the "2020 target" while omitting any reference to maximum reductions.

– Cost must include ancillary costs/benefits, e.g. non greenhouse gas environmental impacts⁴

[Emphases in the original.]

Sweeney’s definition differs from the statutory definition in Sec. 38505(d), and it cannot be applied, in the context of AB 32, to implement Sec. 38560. Sweeney’s definition assumes a predetermined emission target, and determines what is “cost-effective” based on that target emission level. Sec. 38560 does the opposite: It applies the cost-effectiveness criterion to determine the target emission reductions. Sweeney’s definition thus renders meaningless the qualifier “maximum” in Sec. 38560, and renders irrelevant that Section’s use of the term “cost-effective” because, under Sweeney, the target for emissions reductions would be predetermined independently of the cost-effectiveness criterion.

The cost-minimization objective of the Sweeney definition on its face appears to have some relevance to Sec. 38562(b)(1), which requires that AB 32 regulations be designed in a manner that “seeks to minimize costs and maximize the total benefits to California”. However, the “cost” referred to in Sweeney’s definition reflects only the near-term net cost (i.e. costs minus benefits) of achieving the 2020 “target,” whereas the statute does not preclude consideration of long-term (post-2020) costs and benefits in applying Sec. 38562(b)(1).

The prevalent misconceptions and confusion about the meaning and statutory interpretation of AB 32 are reflected in the two principal advisory reports to the ARB, namely the Market Advisory Committee (MAC) and CEC/CPUC advisory reports. These reports regrettably failed to elucidate the regulatory policy implications of Sec. 38560. The Market Advisory Committee did not expressly address the maximum-reduction requirement in its recommendations. Moreover, its first policy recommendation stated the following (page 79):

In 2020, the emissions cap in a California GHG trading program should be set equal to total allowable emissions under the Global Warming Solutions Act minus projected emissions from sources and sectors not covered by the cap-and-trade program.

This recommendation implicitly rejects and contravenes the maximum-reduction requirement because it precludes emission reductions beyond the 2020 limit.

In one place, however, the MAC did advise ARB to consider a policy measure – a price floor operating in the context of cap-and-trade – that, if adopted, could be instrumental in incentivizing further emission reductions pursuant to Sec. 38560. (See page 68 in the MAC report⁵.) This advice implicitly recognized the policy rationale for

⁴ Excerpted from “Sweeney Presentation,”

<http://www.arb.ca.gov/cc/scopingplan/economics-sp/meetings/meetings.htm>.

⁵ http://climatechange.ca.gov/market_advisory_committee/index.html

further emission reductions, though it did not recognize the relevance of a price floor to the statutory requirements of AB 32. (A price floor could resolve the incompatibility between the first above-stated recommendation and Sec. 38560.)

In contrast to the MAC advice, the CEC/CPUC report⁶ argued against a price floor on the grounds that “low prices are likely to indicate that the market is working to drive sufficient investment toward the required emissions reductions” (page 247). The concept of “required emission reductions” implicit in this opinion overtly disregards the maximum-reduction requirement of Sec. 38560, not to mention the clear imperatives of climate change. But the report also states the following, regarding Sec. 38560: “In evaluating allocation options, we consider the extent to which they provide incentives that will further the reduction of GHG emissions in California” (page 137). The report further cites Sec. 38560 in support of additional emission reductions achieved through the voluntary renewable market (page 205).

The MAC and CEC/CPUC reports are symptomatic of the kind of policy incoherence that pervades the AB 32 regulatory process in relation to the Sec. 38560 requirement. Supplemental legislative guidance could help to bring clarity to the process.

Implications

The AB 32 regulations will set an important precedent for other states, the federal government, and nations who will be following California's lead. The Legislature clearly intended AB 32 to be a best-effort response, not just a minimal response, to the serious threat posed by global warming, as evidenced by the Sec. 38560 requirement for maximum emission reductions. But ARB's implementation plan, as it currently stands, will not incentivize emission reductions significantly beyond the 2020 limit even if such further reductions can be achieved at very low cost. This minimalist policy approach, as it stands and when replicated at the regional, federal, and international level, will not serve California's interests in forestalling the potential adverse impacts of global warming.

Three specific policy measures illustrate the potential implications of ARB's minimal response:

(1) The 33% Renewables Portfolio Standard, which has a projected incremental net cost of \$133/MT (i.e. \$133 per metric ton of CO₂-equivalent emissions) relative to the established 20% RPS⁷, will not incentivize expansion of renewable energy beyond the 33% target in the event that costs turn out to be much lower than expected. The adequacy of the 33% target is not the primary issue; a greater concern is what kind of policy precedent this regulatory framework will set. Other states and governments may not be willing to commit to a 33% RPS target with projected net costs of \$133/MT, but they might commit to incentive policies that could achieve a similar result in the event that

⁶ Publication # CEC-100-2008-007-F, October 16, 2008

http://www.energy.ca.gov/ghg_emissions/

⁷ Scoping Plan, Volume II, pages G-I-7 and I-30

costs come down substantially. Solar power, in particular, might reach grid parity within eight years⁸, and effective regulatory incentives could accelerate commercialization of solar power. Increased incentivization of renewable energy outside of California would help to foster economies of scale and create business opportunities for California's clean-tech industries. Thus, an effective incentive policy, initiated by California and adopted by others, could operate to “minimize costs and maximize the total benefits to California” (Sec. 38562(b)(1)) even if California's 33% RPS target is not surpassed. The Legislature should provide clear guidance on whether such incentives are within the scope of the AB 32 legislative policy.

(2) The proposed regulations for passenger vehicles, Pavley 2 and Feebates, have projected incremental net savings of \$262/MT (relative to the established Pavley 1 regulations)⁹, indicating that there is significant untapped potential for cost-effective emission reductions beyond the projected 4 MMT (relative to Pavley 1). Even the \$262/MT savings estimate may be overly cost-conservative; for example, hybrid production costs could fall by a factor of three over the next decade¹⁰. Such advancements in transportation technology should be fully exploited for energy diversity purposes as well as greenhouse gas reductions; but there is no assurance that the AB 32 regulations will adequately exploit this potential because the “cost-effectiveness” approach adopted in the Scoping Plan differs from the AB 1493 cost-effectiveness criterion upon which Pavley 1 was based¹¹. The Legislature should provide guidance on whether ARB's cost-effectiveness criterion under AB 32 should subsume and at least be compatible with the AB 1493 criterion.

(3) The cap-and-trade program, as currently envisaged, would undermine the legislative intent of Sec. 38560. For example, emission reductions from passenger vehicles might significantly surpass the 4 MMT projected in the Scoping Plan, but such further reductions would not necessarily translate into statewide emission reductions because they would generate surplus trading allowances in the transportation sector, resulting in greater emissions elsewhere. Even additional reductions achieved in uncapped sectors such as agriculture would not necessarily affect statewide emissions if ARB follows the previously-quoted first recommendation of the Market Advisory Committee. The currently-envisaged cap-and-trade program would not operate to incentivize further emission reductions; on the contrary, its “market incentives” would deter emission reductions beyond the 2020 limit even if costs are far below initial expectations.

⁸ “U.S. solar field foresees cost parity with coal, gas,” Reuters, Oct. 16, 2008

<http://www.reuters.com/article/environmentNews/idUSTRE49F7OH20081016?sp=true>

⁹ Sept, 2008 Supplemental Evaluations for Draft Scoping Plan, Appendix I, Tables I-2 and I-3.

<http://www.arb.ca.gov/cc/scopingplan/document/draftscopingplan.htm#supplemental>

http://www.arb.ca.gov/cc/scopingplan/document/economic_appendix1.pdf

¹⁰ “Hybrid Production Cost May Drop by Two-Thirds Over Next Decade”

Bloomberg, Oct. 17, 2008

<http://www.bloomberg.com/apps/news?pid=20601207&sid=aUj9rsy0Q878>

¹¹ The AB 1493 criterion is stated in Sec. 43018.5(i)(2): “‘Maximum feasible and cost-effective reduction of greenhouse gas emissions’ means ... Economical to an owner or operator of a vehicle, taking into account the full life-cycle costs of a vehicle.” This will be discussed further under “Legislative policy rationale” – Item 3.

ARB clearly recognizes that the 2020 emission limit is only an interim goal that will need to be quickly followed by much deeper emission cuts to meet the Governor's 2050 goal (“By 2050, reduce emissions to 80 percent below 1990 levels,” Executive Order S-03-05¹²). Some elements of the Scoping Plan could be applied or adapted to incentivize early action toward post-2020 reductions, pursuant to Sec's. 38560 and 38562(b)(1), but the Scoping Plan does not convey any intent to implement such incentives and does not recognize such incentivization as a legislative policy objective. Legislative guidance is needed to ensure that the regulations and precedents established by ARB are adequately responsive to the statutory requirements of AB 32 and the imperatives of climate change.

Legislative policy rationale

Item 1:

This reconciles the semantic and grammatical incongruity between the definition of “cost-effective” (as a noun) in Sec. 38505(d) and the term's use (as an adjective) in Sec. 38560, making it clear that cost effectiveness is a threshold criterion subject to which emission reductions are to be maximized, and that the threshold is quantified, e.g., in dollar-per-ton units.

Sec. 38505(d) differs from the previously-quoted academic definition of cost-effectiveness, as articulated at ARB’s June 3, 2008 Economic Analysis meeting, which is incompatible with the objective of reducing emissions because it is based on a predetermined emission target. The academic definition does not recognize any policy rationale or legislative requirement for further emission reductions beyond the target no matter how low the cost, effectively nullifying the maximization requirement of Sec. 38560.

The clarification is necessary in view of the statement in the Scoping Plan (page 84) that the Sec. 38505(d) definition “does not specify whether there should be a specific upper-bound dollar per ton cost that can be considered cost-effective”. If Sec. 38505(d) is not intended to mean an upper-bound cost (or “threshold”), it is not clear what relevance the definition has to the qualifier “cost-effective” in Sec. 38560.

Item 2:

This clarification is required to reconcile the apparent conflict between the emission-reduction goal of Sec. 38560 and the cost-reduction goal of Sec. 38562(b)(1). Sec. 38560 would have no operative meaning unless it would potentially result in emission reductions beyond the 2020 limit, but such further emission reductions could result in higher costs in the near term, contrary to the cost-minimization requirement. It should be

¹² <http://gov.ca.gov/executive-order/1861/>

recognized, however, that reductions that are not achieved before 2020 would have to be achieved after 2020, at potentially much greater cost, to attain the Governor's 2050 goal. Thus, the maximum-reduction mandate can be instrumental in minimizing long-term costs. Post-2020 costs need to be considered to avoid conflict between Sec. 38560 and Sec. 38562(b)(1).

The revision ensures that ARB will not favor short-term cost reductions, through avoidance of early action pursuant to the 2050 goal, at the expense of far greater post-2020 costs. It clarifies ARB's authority to consider the Governor's 2050 goal in evaluating costs and cost-effectiveness, and to encourage early action pursuant to the 2050 goal to the extent that such action is technologically feasible and cost-effective. In particular, the revision provides a strong justification for the 33% RPS, which will sooner or later have to be achieved – and exceeded – to meet the 2050 requirement.

Item 3:

Condition (1) accommodates the discrepancy between the projected incremental net cost of \$133/MT for the 33% RPS relative to the projected \$10/MT trading price¹³ for the cap-and-trade system, as well as other potential cost disparities, ensuring that the cost-effectiveness requirement does not preclude policy measures that impose justifiably different costs on different emission sources. (Note: The 33% RPS was enacted by Executive Order S-14-08 on November 17, 2008¹⁴, so condition (a) helps to ensure consistency between executive and legislative policy.)

Condition (2) avoids incompatibility between the AB 1493 cost-effectiveness criterion (“Economical to an owner or operator of a vehicle ...”) and the AB 32 criterion (as defined or interpreted by ARB). The amendment ensures compatibility between AB 32 and the legislative policy of AB 1493. (The Scoping Plan did not attempt to achieve maximum feasible and cost-effective reductions in passenger vehicle emissions according to the AB 1493 criterion, as evidenced by the projected \$262/MT incremental net savings for both Pavley 2 and Feebates.)

Condition (2) is minimal and does not preclude ARB from establishing regulations more stringent than the zero-cost requirement. The clause “may impose positive costs ...” recognizes that non-monetized benefits (e.g., public health benefits, post-2020 cost reductions, climate stabilization) may justify positive costs, and that the 2020 limit may necessitate positive costs. The “avoids unjustifiably inequitable distribution” clause recognizes the possibility that zero net economic cost “to California” does not preclude large distributional imbalances in costs and benefits, which should be avoided. The qualifier “unjustifiably” in this clause recognizes that ARB must balance the tradeoff between potential cost disparities (e.g. the \$133/MT RPS cost imposed on Electricity) and avoidance of distributional inequities.

¹³ Scoping Plan, page 75

¹⁴ <http://gov.ca.gov/executive-order/11072/>

Note: “Marginal” cost will be interpreted by economists and ARB to mean the incremental cost of the most costly emission reductions. Positive marginal costs do not preclude positive and substantial savings, as evidenced by the Scoping Plan’s economic projections.

Condition (3) resolves any potential conflict between the 2020 limit and the cost-effectiveness requirement. This makes it explicit that ARB's cost-effectiveness criteria do not supersede the 2020 limit or make the limit irrelevant. Only the legislature and the Governor have authority to suspend, amend, or repeal the 2020 limit.

The limiting language “... shall not be defined ...” in condition (3) recognizes that the qualifier “maximum” in Sec. 38560 has no operative meaning unless it would potentially result in emission reductions beyond the 2020 limit. This ensures that ARB's cost-effectiveness criteria do not render the maximum-reduction objective of Sec. 38560 ineffectual and meaningless, and do not preclude early action pursuant to the Governor's 2050 goal.

It should be noted that the Scoping Plan includes a 5 MMT “margin of safety” beyond the 2020 limit. (The limit is 427 MMT, while the target is 422 MMT.) However, this small overshoot is insignificant, and is unrelated to Sec. 38560, because it only amounts to about one percent of the limit and is intended only to accommodate regulatory uncertainty – not to maximize emission reductions.

It should also be noted that the concept of “safety” implicit in ARB’s “margin of safety” has no basis in climate science and no relevance to the “potential adverse impacts of global warming” (Sec. 38501).

The principle of Sec. 38560 – that the global climate crisis requires a best-effort response, not just a minimal response – must be clearly recognized by California and by other states and nations to ensure some chance of returning global greenhouse gas emissions to a safe and sustainable level.

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