



ENVIRONMENTAL DEFENSE

finding the ways that work

Attachment 1: Description of Emissions Reduction Measure Form

Please fill out one form for each emission reduction measure. See instructions on attachment 2.

Title: Inclusion of the California Electricity Sector in a multi-sector cap-and-trade program

Type of Measure (check all that apply):

- | | | | |
|--------------------|--------------------------|----------------------------------|-------------------------------------|
| Direct regulation | <input type="checkbox"/> | Market-based compliance | <input checked="" type="checkbox"/> |
| Monetary Incentive | <input type="checkbox"/> | Non-monetary incentive | <input type="checkbox"/> |
| Voluntary | <input type="checkbox"/> | Alternative Compliance Mechanism | <input type="checkbox"/> |
- Other Describe:

Responsible Agency: **Air Resources Board**

Sector:

- | | | | |
|------------------|--------------------------|------------------------|-------------------------------------|
| Transportation | <input type="checkbox"/> | Electricity Generation | <input checked="" type="checkbox"/> |
| Other Industrial | <input type="checkbox"/> | Refineries | <input type="checkbox"/> |
| Agriculture | <input type="checkbox"/> | Cement | <input type="checkbox"/> |
- Other Describe:

2020 Baseline Emissions assumed (MMT C2 eq):

156.8 MMT/CO2E

Percent reduction in 2020:

See discussion of “Emission Reduction Calculations and Assumptions” below.

Cost effectiveness (\$/metric ton CO2E) in 2020

For the electricity sector, a cap and trade system is key to enable cost-effective emission reduction opportunities. See discussion of “Cost Effectiveness Calculation and Assumptions” below.

Description:

Environmental Defense believes that emission reductions from the electricity sector in California should be achieved by inclusion of the sector a multi-sector cap and trade program. Under a multi-sector cap and trade program, CARB would set a total allowable limit on emissions from all sectors that are within the cap. Regulated entities would then be required to submit allowances equal to their emissions during each compliance period. Therefore, since the overall cap would be less than the current aggregate emissions, individual plants would be required to either reduce on-site emissions, purchase reductions from other capped facilities, or purchase qualified offsets.

Emission reduction calculations and assumptions:

Calculating the overall emissions reductions (cap): The emissions reductions required under a multi-sector cap-and-trade program are determined by the extent to which the cap is below the actual level of emissions in covered sectors. One of the best aspects of a cap is that it is a limit on the total allowable emissions from sources covered in the cap. Other regulatory approaches, such as performance-based standards, may limit emissions associated with a given activity, but do not limit the amount of activity and thus do not put a limit on total emissions. Furthermore, by observing allowance prices in the marketplace, the real costs of economy wide emissions mitigation can be observed and used to inform future adjustments to the cap. Similarly, the real costs of ratcheting the cap downward can be observed via changes in allowance prices.

We recommend a stringent multi-sector cap that is derived from an aggregation of sector-specific emissions reductions goals. CARB should also consider factors such as the size of the overall cap-and-trade market, the percentage of statewide greenhouse gas emissions that are under the cap, and the availability of offsets and linkages to beyond California in setting the cap. Ultimately, of course, the reductions required under the multi-sector cap-and-trade program, combined with reductions achieved through other measures, must equal or exceed the amount of reductions needed to reduce statewide greenhouse gas emissions to 1990 levels by 2020.

Estimating sector-specific emissions reductions: Several factors affect the calculation of an emissions reductions estimate for each sector. First, the number of emitting entities within each sector and cost curves for potential emissions reductions from that sector will help determine emissions reduction potential. Also, the contribution each sector makes to the overall California emissions inventory and cap-and-trade market is relevant. In addition, any sector-specific estimates rely, in part, on the historic emissions data for that sector. Further, the impact of other regulations applicable to each sector, along with cost and competitiveness factors unique to each sector, must also be assessed.

Cost effectiveness calculation and assumptions:

Economy wide cost effectiveness: There is a difference between a cost-effectiveness metric calculated as the costs per unit of emissions reduced and the idea of a program that is achieving reductions goals as least cost. Cap-and-trade policy ensures the latter. A cap-and-trade program creates incentives for emissions sources to find the least-cost options to achieve emission reductions. In a multi-sector cap-and-trade program, emissions sources have the option of pursuing on-site reduction strategies, purchasing emission allowances from other entities in any other sector under the cap that have been able to beat their own targets, or purchasing qualified offsets from entities not within the cap. This means that trading within and between sectors allows for market participants to seek out and implement the most cost-effective reductions strategies. The cost of emissions reductions achieved under a cap-and-trade program will be lower than the cost of those same emissions reductions achieved through an alternative policy instrument.

The total cost to society of meeting an emissions reduction goal is equal to the emissions mitigation costs incurred by the regulated entities plus the regulatory costs of administering and enforcing the program. Cap-and-trade programs typically involve lower regulatory costs than traditional command-and-control programs for at least two good reasons. First, there is no need for regulators to conduct detailed and time-consuming assessments and rulemakings about specific control technologies, such as establishing Best Available Control Technology measures. Second, the regulated entities have a financial incentive to demonstrate compliance because they can sell unused emissions credits.

Individual site and measure cost effectiveness: A major benefit of trading is that no *a priori* calculation of cost effectiveness by CARB will be needed because market participants will be incentivized to do this calculation internally for their unique reductions options and to then compare their internal options with the market-clearing price for emissions allowances. While the cost effectiveness of specific emission reduction strategies can be calculated as the cost of implementation divided by the amount of reductions achieved, with trading it is not clear that a specific reduction strategy will be used. This “flexible compliance strategy” makes moot the need to determine in advance which abatement methods will be best for individual facilities. Also, a cap-and-trade program eliminates the need for government agencies to estimate which strategies will be used at the facility level because the cap-and-trade program allows individual facilities (who are the ones best positioned to have that information) to weigh their options and then act in a manner that is in their best economic interest.

Creating sector-specific cost curves: To determine how trading might evolve and to forecast allowance prices, we are actively researching sector-specific cost curves and will provide this information when complete.

In order to determine what the costs to facilities will be using marginal abatement curves, it is important to understand the relative differences on potential for emissions between the facilities in each sector. One way to achieve this is through the use of benchmark emissions criteria. These benchmarks establish facility level indexes on emissions by using industry wide data.

Implementation barriers and ways to overcome them:

Leakage may occur: Leakage occurs when actions to decrease emissions in a capped area result in a commensurate increase in emissions in an area outside of the cap. Because California imports a significant amount of electricity, leakage is an issue that must be accounted for in the design of a cap and trade program. AB 32 also explicitly requires that the ARB minimize leakage.

Contract shuffling may occur: Contract shuffling is also an issue that must be appropriately addressed in the design of a cap and trade system for California. Contract shuffling refers to a scenario in which suppliers of out-of-state power could rearrange the assignment of their resources so that the lowest emitting sources are reassigned to serve California load while the higher emitting sources are used to serve load elsewhere. Though on paper the emissions associated with electricity consumed and delivered in California would decrease, the overall emissions in the western region could remain unchanged. This too is an issue that results from California's reliance on a significant amount of imported power.

The Public Utilities Commission and the Energy Commission are currently focusing on ways to address leakage and contract shuffling in the ongoing AB 32 implementation proceeding. The Market Advisory Committee has also highlighted the importance of controlling emissions leakage and preventing contract shuffling. A number of parties, including Environmental Defense, are working closely with the PUC and CEC in efforts to devise programmatic requirements to minimize or eliminate these concerns, including adequately accounting for all electricity imported into the state. We are aware that ARB is also working closely with staff at both Commissions. As final decisions are made about how to best address the issues of contract shuffling and leakage, we urge the ARB to take the recommendations of the PUC/CEC into consideration as it moves forward with the design of a cap and trade program that includes California's electric sector.

Additional Regulatory Measures to Complement a Cap and Trade are needed: To meet requirements of AB 32, California needs to implement a robust multi-sector cap and trade program and a suite of complementary regulatory measures aimed at reducing greenhouse gas emissions. These additional complementary policy measures will enable the state to move to a more efficient, less carbon-intensive electricity system. Such measures include the renewable portfolio standard, building and appliance efficiency measures, demand response programs, combined heat and power, and carbon capture and storage.

1. Renewable Portfolio Standard

California currently has a goal to achieve 20% renewable energy by 2010. The state is also considering establishing a new goal of 33% percent by the year 2020. A robust RPS program is needed to help to bring more renewables on-line, and thereby reduce the greenhouse gases associated with California's electricity sector. The Climate Action Team forecasts that a 33% renewables requirement could deliver more than 10 million metric tons of CO₂ equivalent

greenhouse gas reductions by 2020. In addition, the state needs to address existing barriers to renewables, particularly the lack of adequate transmission from renewable generation sources to load centers.

2. Building and Appliance Efficiency Measures

California has for several decades had very successful policies promoting energy efficiency in buildings and appliances. These policies have helped to keep per capita energy consumption in the state much lower than the national average. However, there are still significant gains to be made by ratcheting down further on existing efficiency requirements in building and appliance codes. These policies will be key in reducing statewide energy consumption and help reduce greenhouse gas emissions.

3. Demand Response Programs and Energy Efficiency Programs

Demand response programs like advanced metering, real-time pricing, and critical peak pricing can play an important role in reducing electricity consumption in California, as can IOU administered energy efficiency programs like home weatherization programs and energy audits. The ARB should work with the CPUC and CEC to incorporate and expand upon the demand response and energy efficiency programs such as those outlined in the State Energy Action Plan II into the scoping plan. As noted by the Market Advisory Committee, these types of policies can significantly reduce to cost of complying with an emissions cap in the electricity sector.

4. Combined Heat & Power

Combined heat and power (CHP) electricity generation offers significant potential (estimates are between 20 million to over a hundred million between now and 2020) for greenhouse gas reductions in California. While a cap and trade system will help deliver the necessary economic incentives to bring about some of this potential, other barriers need to be addressed as well. Currently, high standby charges and existing siting and transmission requirements keep many potential CHP facilities from ever becoming operational. Changes to these existing policies in tandem with a market system will help CHP applications significantly contribute to the state's AB 32 goals.

5. Carbon Capture and Storage

Carbon capture and storage is likely to play an important role in helping entities in the electricity sector comply with AB 32 requirements. While a robust cap and trade program will be crucial to create the necessary economic incentives to pursue these projects, additional policies may also be necessary to ensure that CCS is a viable option for generators in California. Statewide policies should be developed to help clarify regulatory oversight of CCS operations and to clarify the legal rights and responsibilities of CCS project operators to ensure that CCS can emerge as a viable emission reduction strategy in California.

Potential impacts on criteria pollutants

AB 32 requires that any market-based compliance mechanisms be designed to prevent any increase in toxic air contaminants or criteria air pollutants. A well designed cap and trade program (that includes the electricity sector) should not only be able to meet this requirement, but should also yield significant reductions in criteria pollutants. As the Market Advisory Committee points out, the greatest impacts on criteria pollutant reductions under a cap and trade program often occur in areas with the highest levels of local pollution. This occurs because as firms included in the program shift to cleaner production methods to meet greenhouse gas limits, they often decrease the amount of criteria pollutants that are produced as well.

In addition to the direct co-benefits on criteria pollutants a cap and trade program can produce, the program can also achieve targeted reductions in criteria pollutants by devoting revenues from allowance auctioning or through the use focused allowance allocation to firms that make commitments to reduce criteria pollutants.

Name: Virgil Welch

Organization: Environmental Defense

Phone / email: (916) 492 – 7078, vwelch@environmentaldefense.org