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Comments on the California Climate Action Team

Cap and Trade Workshop

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Carbon Cap & Trade Basics

There are a number of basic facts that should be considered and basic principles that should be satisfied for a greenhouse gas (GHG) emission allowance market to function properly.

1. *Sustainable technologies are essential.* The long residence time of carbon dioxide CO₂ and other GHGs in the atmosphere means that solutions must be based on technologies that are sustainable and cost-effective to adopt.

- Technology advances are key to aligning energy and environmental goals in a low carbon future.
- The development and commercialization of sustainable technologies should not be impeded or foreclosed by rushing to implement short-term reductions that are not sustainable in the long term. Locking in near-term technologies with long useful lives may inhibit the introduction of improved and innovative technologies that are currently less economic.

For example, natural gas combustion technologies should be viewed as providing a bridge to a sustainable future – not as a stopgap for achieving short-term carbon reductions. We have already witnessed the volatile effects on natural gas supply and demand of the rapid movement toward burning natural gas in most new electric generators. Even though it produces fewer emissions than coal, the combustion of natural gas does produce considerable carbon.

- The rapid growth in worldwide coal combustion and U.S. dependence on coal for over 50 percent of our electric generation means that new, coal-based technologies capable of reducing or permanently sequestering emissions from coal combustion will be essential for reducing GHG.
 - Increased energy efficiency, renewable power and nuclear power all have a role to play in reducing global carbon emissions.
2. *California's policies should be transferable.* Because the effect of anthropogenic emissions of carbon dioxide and other greenhouse gases is worldwide:
 - California's GHG program should be fundamentally consistent with the European Union Emission Trading Scheme, as well as with Chicago Climate Exchange and global Clean Development Mechanism (CDM) market structures,¹ while promoting emission reductions and trading within California, in the U.S. and abroad.
 - California's policies and programs should recognize that China, India and other countries with growing emissions must also adopt improved technologies and become

¹ The United Nations Framework on Climate Change (UNFCCC) announced the issuance on October 20, 2005 of the first certified emission reductions (CERs) under the Kyoto Protocol. These credits were issued by the Executive Board of the Clean Development Mechanism (CDM) for two hydroelectric projects in Honduras. Since early 2005, when the Kyoto Protocol entered into force, the number of registered CDM projects has doubled every quarter to 26 today with about 300 projects currently awaiting validation.

- a part of trading mechanisms. Otherwise, their growing emissions will swamp reductions made here.
- Technologies to achieve emission reductions, such as fuel efficient motor vehicles, carbon sequestration, and low emission electric generators, are essential to achieve long-term global emission reductions. Hence, emission reductions that rely on advanced technologies should be encouraged and credited.
 - A California-only cap and trade program could be difficult to implement and administer, especially for sectors that engage in significant interstate commerce.
3. *Source diversity is needed for a cap and trade market.* Differences in the costs of emission reductions among GHG sources will be the driving force behind the adoption of improved technologies and the development of a robust trading market.
- Because emissions from mobile source sectors exceed emissions from major stationary sources, such as fossil-fired electric generators, mobile sources should also be included, if at all possible, in California's new cap and trade system.
 - The costs of complying with and enforcing mandatory reductions, whether cap and trade or voluntary, are likely to be significant. Hence, allowing voluntary programs for some sectors, like cement production, and devising means for sources outside of mandatory sectors to "opt-in" are ways to learn by doing and create additional reductions, rather than forcing all sectors into a "one-size fits all" program.
 - California's desire to provide leadership in reducing GHG should recognize that other entities have already made considerable progress in developing markets and trading systems for stationary sources, but not, as yet, for mobile sources. Thus, developing innovative and workable means for the adoption and deployment of measures to reduce mobile source emissions would make a much more significant contribution to reducing global emissions than focusing only on stationary source emissions.
 - According to the October 24, 2005 *Wall Street Journal*, "China's already-serious levels of pollution could *quadruple* over the next 15 years if its rapid increases in electricity consumption and automobile use continue unchecked." [Italics added.] Despite the difficulties achieving and administering emission reductions from mobile sources, if California intends to demonstrate meaningful leadership in reducing worldwide GHG, mobile sources should be incorporated into California's trading system.²
4. *Regulating complex markets is likely to cause unintended consequences.* Regulation of complex markets is inherently difficult and almost always leads to unintended consequences that may have undesirable cost, equity and efficiency impacts.

² Although California tailpipe emissions will be regulated in 2009, the California cap and trade market should allow credit for mobile source reductions within California to ensure that active trading occurs among significant GHG sources. For individual owners, costs of their vehicle's emission increases or savings from reductions could, perhaps, be implemented as a component of their registration fee based on vehicle miles traveled and vehicle class or measured tailpipe emissions. EPA's smog control program already provides a means of estimating emissions based on vehicle tests and mileage information provided during testing.

- A California-only program would be more expensive and problematic than a Western states, WECC-wide or national program. If it is not carried out with a sufficient geographic scope in a fashion that deals with leakage and displacement issues, California's program could fail to achieve meaningful reductions at acceptable costs, thereby discouraging the development of a national program.
- Because of the potential size of the economic costs and benefits to California's economy and environment, the interactions of California's GHG cap and trading proposals with other GHG markets and the timing of long-term caps need to be more fully analyzed and addressed before policy decisions are finalized. Broad studies of California's carbon reduction policies, like EPRI's E-EPIC Study of U.S. emission policies and new technologies from 2000-2050,³ should be conducted to further examine and understand the implications and feasibility of California's proposed cap and trade rules.
- Finally, trying to take a leadership role without taking sufficient time to "get it right" can be costly and counterproductive to reducing global GHGs. Remember that California rushed to lead the way to restructure its electricity market. However, we neglected to analyze thoroughly the impacts of a flawed market design under future market scenarios that reflected uncertainty about future outcomes. Instead, a mandatory spot market, market rules that could be manipulated, the lack of demand response due to frozen rates, and the onset of adverse market conditions gave rise to California's \$40 billion energy fiasco in late 2000.⁴

Because of California's failure to "get things right," efforts by other states and jurisdictions to successfully deregulate the electricity market were ingloriously derailed. The stakes for regulation of carbon emissions and the creation of a go-it-alone California carbon emission allowance market are even higher. This time we need to "get it right," in order to provide positive leadership and to achieve the goals of meaningful GHG reductions across western states and the U.S.

Workshop Issues

Scope of the Emissions Cap

In principle, a national or regional emission cap should apply in order to provide a more feasible and efficient market. Nevertheless, the scope of California's cap and trade program should encompass multiple sectors and incorporate as many opportunities for emission reduction as possible, including certified emissions reductions (CERs) outside of California. Because of differences between sectors, phase-in dates for each sector could be set based on sector

³ Energy-Environment Policy Integration and Coordination Study, EPRI, Palo Alto, CA: 2000. 1000097.

⁴ There are similar parallels and pitfalls inherent in regulating GHGs, as well as important lessons to be learned from experience regulating air emissions over the last 30 years. Leakage, displacement and double counting, reversibility, financial creditworthiness, emissions laundering, auditing among other problems come to mind.

emissions, available mitigation technologies and time needed to resolve administrative complexities, such as establishing certifiable baseline emissions. After the phase-in of each affected sector, the overall combined cap for the combined affected sectors and their individual sources would govern.

With respect to imported electricity, the best, and, perhaps, the only workable solution would be to create an emissions cap covering the entire Western Electricity Coordinating Council (WECC), so that all generating units are covered; “leakage” and “displacement” are minimized, and power procurement costs to California consumers are not inordinately increased. As an interim step that does not consider the costs and other advantages of a WECC-wide approach, California’s electric sector cap could include all specific out-of-state generating resources designated by Load Serving Entities (LSEs) to meet the CPUC’s resource adequacy requirements (RAR).⁵ In essence, any out-of-state generating unit applied by an LSE toward meeting its resource adequacy requirement would be subject to the emissions cap. Because the CPUC’s resource adequacy requirements are moving LSEs toward unit-specific power purchase contracts, over time an increasing proportion of imported power should come from known generating units, rather than system resources. For the remaining firm power imports that are not unit-specific, default emission factors could be developed, perhaps pro-rated from each LSE’s verified emissions per kWh for all its other kWh or from a system-wide factor certified by the seller under a firm power purchase contract included in the RAR.

In addition to in-state sources that are mandated to become a part of the program, i.e., the “affected sources,” California’s program could allow sources or sinks located outside California to “opt-in” and become affected sources. For example, in the electric sector LSEs might be allowed to “opt-in” other, specific out-of-state emission sources used for serving California electric loads, but which are not counted towards RAR or to contract with landowners for verifiable sequestration projects. In general, contracted out-of-state sources or sinks, such as forests located on private lands, would choose to opt-in only if they could provide additional reductions that would then free up marketable emission allowances. By allowing the inclusion of voluntary “opt-in,” additional sources/sinks, the geographic scope of the program would be expanded, encouraging carbon emission reductions within and outside of California.

Many factors, including the marginal costs of emission reductions, industry specific and societal economic impacts, timing, administrative and enforcement costs, and the magnitude of achievable reductions should be considered before determining the scope of coverage and the target quantities for the emissions cap in particular years. In the electric power sector alone, effects on fuel and power prices, generating technology and pollution control choices, the economic viability of existing plants, transmission constraints and local system reliability should

⁵ CPUC, Draft Decision on Resource Adequacy Requirements, Rulemaking 04-04-003, September 27, 2005. Generating units will not be considered qualifying resources for purposes of the RAR program unless the owner has submitted its qualified capacity value and supporting documentation to the CAISO. GHG emissions from these units will be known and quantifiable.

be examined in detail under a variety of future market conditions. These analyses should consider changing market conditions, including the CAISO's Market Redesign and Technology Upgrade (MRTU), renewable portfolio standards, resource adequacy and local area requirements, demand response, vehicle electrification, energy efficiency measures and low hydro conditions, among other elements.

As previously stated, there is also a need to consider the pace of technology advancement in each sector to better understand how the inclusion of multiple sectors under future caps can provide greater overall emission reductions at a lower cost.

Allowance Distribution

Every allowance distribution method will confer advantages to some market participants and create some distributional inequities. A combination of grandfathered allocations for a substantial portion of the allowances, along with an auction-based approach for allocating the remainder of the allowances is likely to have merit over a grandfathered approach by itself. Further analysis of the affected sectors could define an appropriate percentage split between the allocation and auction approaches that would lead to acceptable emission reductions, compliance and administrative costs.

Despite the difficulties of determining appropriate baseline emissions, grandfathering a substantial portion of the initial allocation to those parties with current emissions would likely keep the initial, out-of-pocket costs of a cap and trade system lower than auctioning all the initial allowances. The number of allowances allocated at a "zero-cost basis" will essentially determine the initial marginal costs of compliance and help set the price of initial trades, i.e., the value of a carbon emission allowance under California's program. Nevertheless, the adoption of an auction or periodic auctions for distributing allowances would also set a market-clearing price and allow redistribution of revenues received.

Because of many complexities, the effects of market design features and alternative market characteristics over time should be considered carefully under a variety of future market scenarios.⁶ In addition, the EPA's SO₂ allowance system can provide helpful experience in the design of California's cap and trade system. The intent of the annual EPA auction was to provide the opportunity for new entrants to obtain allowances and to provide a public market-clearing price once a year. In the SO₂ allowance system about 2.8 percent of the allocated allowances for each year was withheld for sale in an annual allowance auction of two vintages:

⁶ Numerous EPA and EPRI quantitative studies were performed during the SO₂ market design period in the 1980s, leading to the 1990 Clean Air Act Amendments and rules governing the market. Further studies were conducted prior to allowance trading, which began in 1992, and prior to compliance with the Phase 1 cap, which took effect in 1995. (See, for example, Integrated Analysis of Fuel, Technology and Emission Allowance Markets. EPRI TR-102510, Electric Power Research Institute, Palo Alto, CA. 1993.) Although scoping studies have been performed, more detailed, integrated analyses within and across sectors are needed to guide California decisionmaking regarding the impacts of California's carbon emission market proposals.

the current year and seven years in advance. Proceeds of each year's SO₂ auction are returned to holders of the original allocations.

Although the EPA's SO₂ cap and trade program has been very successful in many regards, a number of its apparent successes, like low allowance prices from 1994 through 2003, were due to the surplus of allocated and bonus allowances that were banked, obviating the need to reduce emissions down to Phase 2 cap levels and reducing the need to purchase allowances for compliance. Now that the allowance bank is being depleted, allowance purchases or emission reductions are necessary to avoid compliance penalties. In the face of additional impending reductions under the Clean Air Interstate Rule, high gas prices and the need to purchase allowances to comply with the cap, SO₂ allowance prices have risen from under \$150 per ton at the beginning of 2003 to over \$1000 today.

The attributes of the nationwide SO₂ allowance market are, in many respects, more favorable than those for a more complex carbon emissions allowance market. Market behavior and the costs of a carbon cap and trade approach will be strongly influenced by allocations, banking rules, compliance periods and on the breadth of opportunities for trading freely among different sources to lower the cost of emission reductions.

Offsets

Because carbon emissions reduction is a global goal and the benefits from carbon reduction do not depend on the location of the emission reduction, the location of offsets should not be a factor.⁷ To the extent that offsets qualify as certified emission reductions (CERs) they should be included in the design of the cap and trade program.

Ultimately, California's emission market for carbon will need to be part of broader carbon-related markets. As a result, even emission offsets in developing countries, like those certified under the Clean Development Mechanism (CDM), would enhance the likelihood of achieving worldwide emission reductions. Here again, California should take advantage of prior initiatives, rather than creating a limited California-only market for emission reductions and offsets.

Other Program Design Considerations

The following brief comments address other issues identified in the Workshop discussion paper.

Restrictions should not be placed on the trading of allowances. Creating separate classes of carbon emission allowances with restricted trading rights has not been justified and would impede efficient market function.

⁷ Of course, because carbon reduction methods can also cause the concurrent reduction of other emissions like NO_x and SO₂ the location of the reduction can be important.

Banking should be permitted to provide stability and risk hedging for market participants. The extent of banking can also be coordinated with lead times to implement some technologies. In addition, a multi-year compliance period would provide similar flexibility. Nevertheless, the market design and parameters selected should anticipate the likely amount of banking, since the size of the bank will affect the pace and price of emission reductions and the supply/demand balance of allowances in the market. Indeed, the size of the SO₂ allowance banks held by individual companies has had a significant effect on the rate of Phase 2 emission reductions and on emission allowance prices.

Borrowing from future vintage allowances could inhibit trading of current vintage allowances. Restrictive borrowing on limited occasions or under certain conditions could be considered, provided payback is near-term and exceeds the amount of allowances borrowed. A multi-year compliance period would lessen the need to borrow due to adverse market conditions, such as a low hydro year. Both borrowing and banking reflect the more generic problem of selecting proper discount rates for evaluation.

Flexibility in defining the rights of allowance holders, the tonnage covered by allowances and other market rules will be needed in order to adjust the program over time, and, ultimately, to achieve conformity with other U.S. and international carbon market mechanisms.

Conclusions and Recommendations

The following conclusions and recommendations for the design and evaluation of California's prospective carbon emissions allowance market are based on 25 years experience with emissions regulations and the behavior of fuel, electricity and emissions markets:

- A major goal of California's efforts is to prompt the rest of this nation, where most of the U.S. emissions reside, and developing countries to reduce GHGs.
- Because of the global scope of the problem, attention should be given to ensuring that California's cap and trade system is compatible with other emission markets and that compliance with California's program will be transferable (but not double counted).
- The potential impacts of California's cap and trade program strongly suggest that extensive, ongoing and explicit analyses of program options should be carried out well in advance of selecting particular market design parameters, operational elements and rules. Program parameters should be flexible enough to guard against unintended consequences.
- Because of the possibility of stranded investments, unknown administrative costs, and costs arising from unintended consequences, near-term carbon caps should reflect cost-effective reductions.
- The reduction targets implied by future emission caps need to be closely coordinated with the accelerated development of advanced, low-emitting technologies in each affected sector.

- The most beneficial low-emitting technologies would be those with applications elsewhere in the U.S. and in countries with growing GHG emissions, like India and China.
- Because technologies advance at different rates in different sectors, the cap and trade system should encourage the efficient adoption of advanced technologies by enabling trading across both mobile and stationary source sectors, if possible.
- Other sectors should also be included, some with initial participation on a voluntary basis to gain experience with different GHG reduction approaches. If voluntary reductions do not occur, the mandatory program can be expanded.

In conclusion, we should take the time to evaluate many alternatives under a variety of future circumstances, aiming to create an effective program that will enhance development of advanced technologies, while remaining flexible enough to incorporate new knowledge as the program matures.