Danielle Osborn Mills
09-10-2
11/20/08

BEFORE THE AIR RESOURCES BOARD OF THE STATE OF CALIFORNIA

October 2008 Proposed Scoping Plan
Pursuant to Assembly Bill 32,
The California Global Solutions Act of 2006

Comments of the Center for Energy Efficiency and Renewable Technologies

Regarding the Measures of the Climate Change Proposed Scoping Plan

Center for Energy Efficiency and Renewable Technologies (CEERT)
November 20, 2008

The Center for Energy Efficiency and Renewable Technologies (CEERT) commends the Air Resources Board (ARB) for producing a plan of such unparalleled magnitude and scope, and appreciates the opportunity to offer these comments on the Proposed Scoping Plan, released on October 15, 2008.

Core Measures:

1) **33% Renewables Portfolio Standard by 2020**

CEERT supports the inclusion of this provision in the Proposed Scoping Plan, and applauds the ARB for their leadership in setting forth the goal that a full third of California's energy will be met with renewable resources by 2020.

A procurement target of 33% renewable electricity by 2020 will not only help the State of California meet its climate goals, but will also provide significant environmental co-benefits by reducing other non-GHG pollutants. Additionally, CEERT believes that increased penetration of renewable electricity will create enormous economic opportunities for the state of California, particularly through industry growth and employment. The ARB should continue to explore the potential for economic benefits through electricity measures by more accurately modeling fuel price forecasts to capture greater economic benefits,[1] and by developing a more specific plan to remove barriers to siting, permitting, and transmission.

Transmission

CEERT supports the ARB's acknowledgement of the need to provide sufficient electric transmission lines to renewable resource zones, as well as system changes to allow integration of large quantities of intermittent wind and solar generation. The Renewable Energy Transmission Initiative (RETI) is a broad collaborative striving to identify and prioritize renewable generation zones with associated transmission, and it is crucial to meet the timelines of the initiative, particularly CPUC and POU approval of transmission projects in April of 2011 and 2012.

The Proposed Scoping Plan does not, however, consider the need for energy storage technologies, which will help California meet its goals for renewable electricity, energy conservation, and greenhouse gas emissions reductions.

Feed-in Tariff

The ARB appropriately addresses the complexities and costs faced by small renewable electricity developers in contracting with utilities. CEERT supports the option of offering a feed-in tariff for all RPS-eligible renewable energy facilities up to 20 MW in size. The increase from 1.5 MW to 20 MW facilities is a welcome step that will likely defray administrative and other costs associated with development of projects less than 20 MW in size.

[1] Further comments on the fuel price forecasts can be found in the Economic Analysis Section.

Feed-in tariffs are widely used in France, Spain, and Germany, and have effectively led to increased investment and development of renewable generation. In Germany, renewable energy technologies are guaranteed interconnection with the electricity grid, and are paid a premium rate (differentiated by technology and decreasing each year) that generates a profit for investors over a 20-year term.[2] The tariff helped Germany become the largest market for PV and wind, developing 4,000 MW of renewable electricity in 2006 alone,[3] the same year that California installed approximately 200 MW.[4] The ARB should continue to explore the benefits of feed-in tariffs on renewable energy markets, and should extend the policy to include combined heat and power and renewable distributed generation projects.

2) Energy Efficiency

Combined Heat and Power

A goal of displacing 30,000 GWh from the grid through installation of 4,000 MW of CHP in 2020 is included in as an energy efficiency recommendation in the Electricity sector, for an estimated 6.7 $MMTCO_2E$ of reductions. This recommendation appears to be geared towards removal of institutional barriers, accuracy of accounting, and attribution of emissions reductions. CEERT supports the inclusion of this measure, and recommends that it be enhanced prior to Board adoption in three ways:

1) Ensure that CHP deployment under AB 32 targets also supports reductions of criteria air pollutants. To do so, the ARB should consider prioritizing deployment of the cleanest (on both a GHG and criteria pollutant basis) and most efficient units first. Specifically, deployment of ultra-clean and low-emission distributed generation technologies should be given priority. These technologies produce zero emissions during their operation or produce emissions during their operation that are equal to or less than the 2007 State Air Resources Board emission limits for distributed generation, which are generally equivalent to a central station natural gas fired power plant. Combined heat and power applications are exceptions, and must operate with a 60 percent system efficiency on a higher heating value.[5]

2) Define the barriers to be removed, how they will be removed, and by what date.

3) Discuss whether or not existing gas-fired generation will be replaced by the 30,000 GWh of CHP electricity that will be brought on-line by 2020.

---

[2] Rickerson, Bennhold, and Bradbury. Feed-in Tariffs and Renewable Energy in the USA – A Policy Update. May 2008. http://www.boell.org/docs/Feed-in%20Tariffs%20and%20Renewable%20Energy%20in%20the%20USA%20-%20a%20Policy%20Update.pdf

[3] http://www.renewableenergyworld.com/rea/news/story?id=50748

[4] California Public Utilities Commission. Progress of the 2007 Renewable Portfolio Standard. http://docs.cpuc.ca.gov/published/GRAPHICS/63854.PDF

[5] California Public Utilities Code 353.2defines ultra-clean and low-emission distributed generation.

CEERT is pleased to see that ARB mentions utility-provided incentive payments, a CHP portfolio standard, transmission and distribution support payments, as well as the feed-in tariffs as potential components of this measure and looks forward to greater detail in the rulemaking process.

Million Solar Roofs Program

The Proposed Scoping Plan calls for 3,000 MW of solar-electric capacity under the California Solar Initiative (CSI), New Solar Homes Partnership and solar programs for POUs. CEERT supports expanding the CSI goals in the Proposed Scoping Plan to 5,000 MW, as considered in the Draft Scoping Plan. SDG&E, SCE and LADWP have all recently announced large solar PV investments and goals that will help California reach more aggressive greenhouse gas emissions reductions. Furthermore, enormous opportunities exist to install more solar facilities.

CEERT recommends the use of feed-in tariffs for distributed solar systems of all sizes. The ARB clearly recognizes the value of feed-in tariffs in reducing capital costs and promoting development of renewable technologies, as mentioned in the measure to implement a 33% Renewables Portfolio Standard. Feed-in tariffs for distributed generation systems will help California harness solar energy quickly while reducing transmission costs, water impacts, and greenhouse gas emissions.

Economic Analysis

1) Fuel Price Forecasts in Economic Analysis

CEERT remains concerned with the use of low fuel price forecasts in the ARB's Economic Analysis, which do not reflect historical trends of volatility and price increases over the last decade. The ARB should model higher price forecasts in order to move forward with implementation of the Scoping Plan, and before considering the cost-effectiveness of additional emissions reduction measures.

Natural Gas Price Forecasts

The ARB should revise the fuel price forecasts used in the Economic Analysis to include a range of fuel prices beginning with the CEC forecast on one end and continuing to increase on a trajectory, as they have been for the last decade.

The CEC's 2007 forecast predicted that natural gas prices would remain approximately unchanged at about $8/MMBTU, and thus the ARB used a forecast of $7.94/MMBtu (in 2007 dollars) in 2020. As historical data now reflects, this forecast failed to anticipate the rapid increase in gas prices seen in the last year. On June 30, 2008, natural gas was trading at $13/MMBTU and the average natural gas price for October 2008 was back down, below $8/MMBtu.

Based on historical trends, natural gas prices will either continue to increase, hold steady, or decline, and theories exist to support any of these choices. The historical record of U.S. gas prices is shown in the figure below. Note that the forecasts shown in Figure 2, below, are higher than the forecasts used by the ARB in the Economic Analysis.

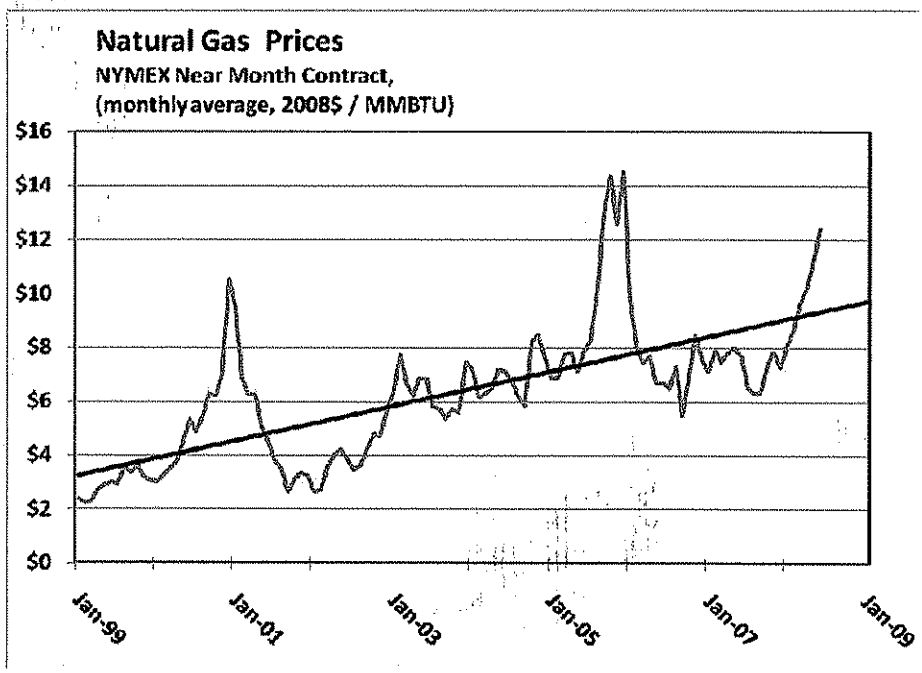

Figure 1. Actual Natural Gas Prices

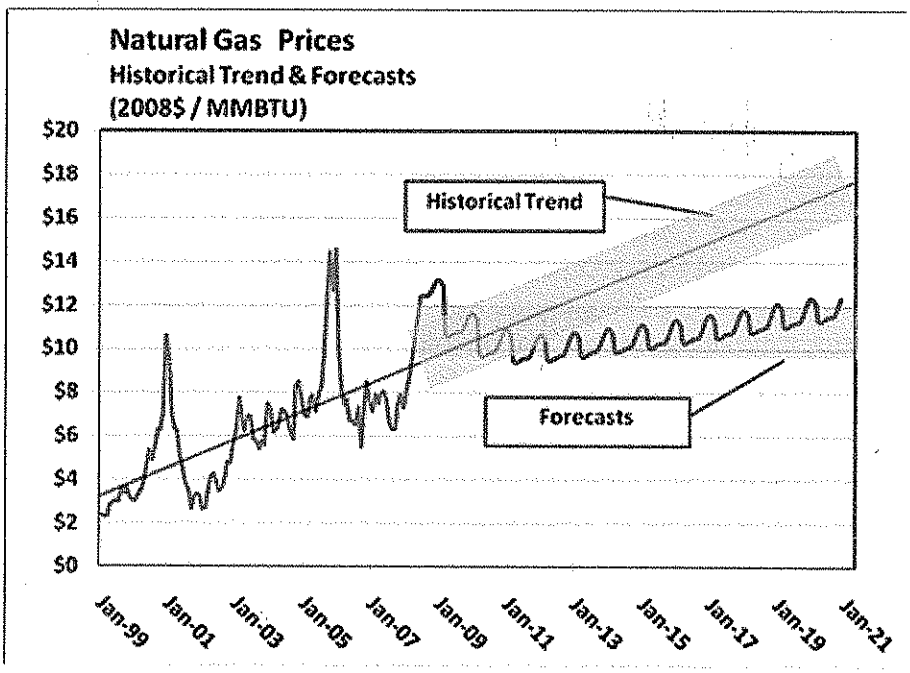

Figure 2. Natural Gas Price Trend and Forecasts

Thus, CEERT suggests that the ARB include a range of natural gas prices to address volatility, beginning with the CEC forecast on one end, and increasing to $17/MMBTU. CEERT and other parties in the CEC/CPUC joint greenhouse gas rulemaking have suggested these numbers for their models as well.

Gasoline Prices

Recent trends would suggest that it is highly unlikely that gasoline prices will hold steady at $3.67 per gallon for 12 more years, as the ARB's Economic Analysis supposes. To that end, the ARB should also include a range of gasoline prices beginning with the CEC's forecast and following the historical trajectory out to 2020. To be thorough, CEERT recommends modeling a price as high as $20/gallon.

Additional Measures for ARB Consideration:

1) **Zero-Emission Heating and Cooling (ZEH/C) Systems**

CEERT agrees with the recommendations submitted by the California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) to expand the Proposed Scoping Plan reduction measures to develop and include a program that specifically addresses California's heating and cooling sector. CAEATFA estimates that the total heating cooling sector in California accounts for 27% of the State's total annual GHG emissions. The CAEATFA recommendations calling on the gas and electric utilities to establish a performance based incentive for all near-zero emission heating and/or cooling (ZEH/C) systems. Eligible technologies include solar thermal, geothermal, and fuel cells. CAEATFA suggests that over ten years, under a well-designed performance-based incentive program, the State could achieve 20 $MMTCO_2E$ of reductions annually.[6]

- Solar Thermal: The Economic and Technology Advancement Advisory Committee (ETAAC) found that California could achieve an additional 20 $MMTCO_2E$ through advanced solar thermal technologies alone. The ETAAC report also identified significant opportunities for emissions reductions from advanced solar thermal (AST) and solar hot water systems, estimating that the use of solar hot water systems alone could result in 7.8 to 8.6 $MMTCO_2E$ of annual savings from California's residential and commercial sectors, and more than 15 $MMTCO_2E$ from AST systems.

- Geothermal: ZEH/C from geothermal can also greatly contribute to the State's GHG emissions reduction targets. Geothermal heat pumps, for example, can cut energy use by

[6] California Alternative Energy and Advanced Transportation Financing Authority. Comments of the California Alternative Energy and Advanced Transportation Financing Authority Regarding the Inclusion of Broader Incentives for Zero-Emission Heating and Cooling Systems. Filed September 30, 2008.

70%, according to the U.S. Department of Energy's Office of energy Efficiency and Renewable Energy.[7]

- Fuel Cells: Fuel cells can be zero-emission when fueled by renewable sources by using renewable gases that would ordinarily be treated as a waste product and destroyed through combustion.

Program Design

A government incentive program will help reduce the up-front capital costs associated with solar thermal, geothermal, and fuel cell zero energy heating and cooling. The ARB should include the following elements in the design of the performance based incentive:

- Long-term declining ratepayer incentives based on metered useful output
- Incentive payments based on a per kWh equivalent of heating, cooling, and/or electricity generated, which includes the value of distributed generation
- Project costs and incentive payments must be public and transparent

Other Issues:

1) **Renewable Energy Credits: Compliance Obligations of Renewable Energy Generators**

The design of a cap-and-trade system should recognize the GHG reduction benefits of renewable electricity without imposing regulatory compliance burdens on renewable electricity generators. CEERT appreciates the Joint Energy Agencies' Final Opinion on Greenhouse Gas Regulatory Strategies,[8] asserting that renewable electricity generators should in no instance be required to purchase allowances. Furthermore, the joint energy agencies ruled that RPS-eligible generation with zero GHG emissions does not need GHG emissions allowances when delivered to the California grid, regardless of whether the RECs have been unbundled from the electricity such that the electricity is delivered as null power. These decisions indicate that the CEC and CPUC recognize that the aforementioned entities are not emitting greenhouse gases and therefore should not be considered as regulated entities under the cap.

It is especially important to clearly define the compliance obligations of renewable energy generators, specifically in the instance that a renewable energy generator has sold or otherwise transferred its renewable energy credit (REC) to a load-serving entity, the voluntary market, or another entity. Additionally, CEERT offers to continue to work with the ARB, CPUC, and WCI

[7] http://apps1.eere.energy.gov/consumer/your_home/space_heating_cooling/index.cfm/mytopic=12640

[8] California Public Utilities Commission and California Energy Commission. Final Opinion on Greenhouse Gas Regulatory Strategies. Decision 08-10-037, October 16, 2008.

Electricity Subcommittee to appropriately define the First Jurisdictional Deliverer of imported power in a way that minimizes leakage and contract shuffling.

CEERT strongly urges the ARB to work with the Commissions to clarify that the transfer of a REC does not result in generation from the renewable energy resource being transformed or treated as null power. CEERT's comments to Peevey PD in R.06-04-009 suggest a process to avoid double-counting of emissions reductions from renewable electricity that has been unbundled from its REC, which should apply to renewable electricity under WCI's first jurisdictional deliverer point of regulation:

- Renewable electricity generators that do not bundle the electricity with RECs should not be required to hold allowances associated with null power.
- Entities regulated as the first jurisdictional deliverer (FJD) of electric generation from a renewable source into WCI regions should not be required to purchase allowances associated with null power. Assuming the allowance value for renewable resources could artificially be determined to be zero, the allowances would then have to be immediately retired to prevent resale.

These recommendations ensure that renewable generators are never required to purchase allowances, and that first jurisdictional deliverers are not adversely affected by the procurement of power generated from a renewable source.

2) Renewable Energy Credits: Retention of the Voluntary Market within a Cap and Trade System

CEERT recognizes the tremendous potential of the voluntary renewables market to drive real, additional, verifiable emissions reductions above and beyond what is required by the cap, and strongly recommends that the ARB include a measure to preserve the voluntary market under a cap-and-trade program. To do so, CEERT suggests that the ARB and other WCI partner jurisdictions adopt an 'off-the-top' rule, similar to the approach adopted in the RGGI Model Rule, where carbon benefits related to voluntary purchases could be retired 'off-the-top' of the regional cap before allocating allowances to the states.

If the voluntary market continues to grow at a rate of 35% annually, it will reach about 40 million MWh by 2010 and represent about one-quarter of the total U.S. demand from voluntary and compliance markets.[9] In addition, a robust voluntary market will ensure the continued success of renewables markets in financing renewable energy projects, and will provide businesses and individuals with a clear opportunity to support renewable energy development. To ensure that these voluntary customers continue to receive emission-reduction value from the purchase of these products, a cap and trade system needs to recognize and include a provision to address this market. CEERT recommends that California and all other WCI Partner jurisdictions adopt an 'off-the-top' rule. The approach would work in the following way:

---

[9] Bird, Lori, and Elizabeth Lokey. *Interaction of Compliance and Voluntary Renewable Energy Markets,* Golden, CO: National Renewable Energy Lab, October 2007.

1. Providers of voluntary renewable energy credits (RECs) within the capped sector notify the Program Administrator of their projected voluntary REC sales for the upcoming year.
2. Program Administrators convert the MWh sales projection to tons of avoided carbon dioxide and provisionally remove this quantity of allowances from the entire pool available under the cap.
3. Each year, parties providing voluntary renewable energy products document their actual REC sales or associated generation, and the Program Administrator retires a commensurate amount of allowances.
4. At the end of the allowance compliance period, any difference between projected REC sales and actual REC sales is trued up.

Preservation of the voluntary market is essential to inducing continued emissions reductions from the purchase of renewable electricity by unregulated entities, thereby reducing the cost of renewable electricity. The voluntary REC market should receive proper attention and concern in the WCI program design and throughout the AB 32 rulemaking process.

3) CEQA Threshold of Significance

While it is understood that ARB and Office of Planning and Research (OPR) staff will not address each type of project that may be subject to CEQA, CEERT suggests that staff consider the impact of this threshold on facilities that may emit more than 7,000 metric tons of CO_2E through generation of low-carbon renewable energy. CEERT recommends that the interim significance threshold for greenhouse gas emissions under CEQA be set equivalent to the 25,000 metric tons of CO_2E threshold for coverage used in the Western Climate Initiative, in order to prevent additional barriers on the development of renewable generation facilities.

Conclusion

CEERT believes that the Proposed Scoping Plan presents an enormous opportunity for the State of California to grow its economy, increase its development of clean energy, and achieve environmental co-benefits while reducing greenhouse gases. CEERT looks forward to working with the ARB during the rulemaking process.