WHITE PAPER ON A CLEAN ENERGY STANDARD

Sens. Jeff Bingaman and Lisa Murkowski
Committee on Energy and Natural Resources
United States Senate
March 21, 2011

Purpose

In his recent State of the Union address, President Obama proposed a Clean Energy Standard (CES) to require that 80 percent of the nation's electricity come from clean energy technologies by 2035. The Senate Energy and Natural Resources (ENR) Committee now faces a threshold question of what the general policy goals for the electric sector are and whether a CES would most effectively achieve them. Is the goal to reduce greenhouse gas emissions, lower electricity costs, spur utilization of particular assets, diversify supply, or some combination thereof? Depending on the goals, is a CES the right policy for the nation at this time? If so, is 80 percent by 2035 the right target? If not, should alternatives to reach similar goals be considered?

The purpose of this document is to lay out some of the key questions and potential design elements of a CES, in order to solicit input from a broad range of interested parties, to facilitate discussion, and to ascertain whether or not consensus can be achieved.

Introduction

Advocates of a CES maintain that requiring the deployment of increasing amounts of clean electricity can lead to a variety of benefits, such as the reduction of greenhouse gases and other emissions, as well as an increase in domestic manufacturing of associated technologies. In contrast, opponents have claimed that a federal electricity mandate, depending on its design, could pick winners and losers among competing technologies and serve as a tax that may cause a wealth transfer from those regions of the country lacking compliant resources.

Congress has debated Renewable Portfolio and Renewable Electricity Standards (RES) for the past decade. During the 111th Congress, the ENR Committee included a 15 percent by 2021 RES in S. 1462, the American Clean Energy Leadership Act of 2009. While a number of CES proposals have been introduced or discussed in past Congresses, the concept has not yet been seriously considered or analyzed.

Over time, there have been a variety of goals advanced for deployment of clean or renewable energy. For some, the primary focus of an RES has been to enhance the competitiveness of renewable technologies in the short term, in order to allow them to become economically competitive with fossil technologies. Other proposals have focused on diversifying electric generation in order to guard against possible resource constraints. Still others highlight the emissions reduction potential of these technologies.

If the ENR Committee elects to develop a CES, there are a number of design questions that require careful consideration. The decisions made in the design of such a standard will necessarily favor certain priorities over others.

Current State of Clean Energy Deployment

Data from the Energy Information Administration (EIA) indicates that in 2010, domestic electricity generation was comprised of about 20 percent from nuclear power plants, 10 percent from renewable energy power plants (hydropower, wind, solar, geothermal and biomass), 25 percent from natural gas power plants, and 45 percent from coal power plants. If clean energy were defined as renewable and nuclear energy only, then the United States would currently be obtaining 30 percent of its electricity from clean sources. If efficient natural gas (i.e. combined cycle) were included as well – and awarded "half credits" in accordance with the President's CES proposal – the United States would currently be obtaining 40 percent of its electricity from clean sources.

The EIA reference scenario, in its 2011 Annual Energy Outlook, projects that overall electric generation will increase by about 20 percent between 2010 and 2035. The majority of new capacity is expected to come from natural gas power plants. Natural gas is expected to maintain its 25 percent share of overall electricity generation throughout this period. Renewable power is expected to grow to a 14 percent share of the generation mix. Nuclear is expected to add capacity but decrease slightly in its overall share of the generation mix to 17 percent in 2035. Events in Japan may affect that potential growth in capacity. Generation from coal is expected to increase overall but decrease to a 42 percent share of the generation mix.

Key Elements for Clean Energy Standard Proposals

1. *What should be the threshold for inclusion in the new program?*

In the RES contained in S. 1462 last Congress, utilities selling four million megawatt hours or more of retail electric power in a calendar year would have been subject to the mandate. Additionally, the State of Hawaii was specifically excluded from the program's requirements. The President's CES proposal does not appear to contain a threshold for inclusion, which means that all electric utilities, regardless of size, would be responsible for meeting any new requirements imposed by a CES.

Key Questions:

- Should there be a threshold for inclusion or should all electric utilities be subject to the standards set by a CES?
- Should any states or portions of states be specifically excluded from the new program's requirements?
- How should a federal mandate interact with the 30 existing state electricity standards?

2. *What resources should qualify as "clean energy"?*

The definition of what qualifies as "clean energy" will be crucial in determining the overall mix of technologies deployed to comply with a CES. While previous CES proposals have gone beyond the narrow set of renewable technologies allowed under a RES, by including nuclear plants and coal plants with carbon capture and storage (CCS), the President's proposal also seeks to allow efficient natural gas without CCS to count towards compliance. While past proposals have credited energy efficiency measures to varying degrees, the President's CES proposal does not give clean energy credits for energy efficiency measures.

Key Questions:

- On what basis should qualifying "clean energy" resources be defined? Should the definition of "clean energy" account only for the greenhouse gas emissions of electric generation, or should other environmental issues be accounted for (e.g. particulate matter from biomass combustion, spent fuel from nuclear power, or land use changes for solar panels or wind, etc.).
- Should qualifying clean energy resources be expressly listed or based on a general emissions threshold? If it is determined that a list of clean energy resources is preferable, what is the optimal definition for "clean energy" that will deploy a diverse set of clean generation technologies at least cost? Should there be an avenue to qualify additional clean energy resources in the future, based on technological advancements?
- What is the role for energy efficiency in the standard? If energy efficiency qualifies, should it be limited to the supply side, the demand side, or both? How should measurement and verification issues be handled?
- Should retrofits or retirements of traditional fossil-fuel plants be included in the standard?
- Should the standard be focused solely on electricity generation, or is there a role for other clean energy technologies that could displace electricity, such as biomass-to-thermal energy?

3. *How should the crediting system and timetables be designed?*

The design of the crediting system and the timing and stringency of the targets will necessarily impact the mix of technologies deployed as well as the ultimate costs imposed on end-use customers. For example, previous RES and CES proposals have called for taking certain existing technologies out of the baseline for purposes of calculating the mandate (e.g. conventional hydropower), while providing full credits to new resources.

Key Questions:

- Should the standard's requirements be keyed to the year 2035 or some other timeframe?

- What interim targets and timetables should be established to meet the standard's requirements?
- What are the tradeoffs between crediting all existing clean technologies versus only allowing new and incremental upgrades to qualify for credits? Is one methodology preferable to the other?
- Should partial credits be given for certain technologies, like efficient natural gas and clean coal, as the President has proposed? If partial credits are used, on what basis should the percentage of credit be awarded? Should this be made modifiable over the life of the program?
- Is there a deployment path that will optimize the trade-off between the overall cost of the program and the overall amount of clean energy deployed?
- What would be the effect of including tiers for particular classes of technology, or for technologies with different levels of economic risk, and what would be a viable way of including such tiers?
- Should the same credit be available to meet both the federal mandate and an existing state standard or should a credit only be utilized once?
- Should there be a banking and/or borrowing system available for credits and, if so, for how long?

4. *How will a CES affect the deployment of specific technologies?*

The value and expected future value of clean energy credits created by a CES will be the primary driver of clean energy deployment. Each technology faces different economic and financing issues. Some, such as nuclear energy, face significant upfront capital costs but low ongoing fuel costs. Others, such as natural gas power plants, may be deployed relatively inexpensively but with a higher percentage of ongoing costs coming from fuel. How credit value changes the economics of each individual technology will determine which technologies get deployed.

Key Questions:

- How valuable would clean energy credits have to be in order to facilitate the deployment of individual qualified technologies?
- How might a CES alter the current dispatch order of existing generation (such as natural gas-fired power plants), which has been driven by minimization of consumer costs, historically?
- What is the expected electricity generation mix for a target of 80 percent clean energy by 2035, under the President's proposal or an alternative construct?
- Could different crediting and requirements than those proposed by the President be more effective in deploying clean technologies?

5. ***How should Alternative Compliance Payments, regional costs, and consumer protections be addressed?***

In considering a CES, it is important to consider the additional costs that may accompany such a policy and how those costs may vary by region. Some regions of the country contain more abundant energy resources than others, and utilities within those regions may be utilizing vastly different fuel mixes. Important design goals for a CES are to ensure price certainty for consumers and industry, minimize regional disparities in the cost of such a policy, and contain costs overall. The RES contained in S. 1462 last Congress included cost containment mechanisms such as limiting the electric rate impact of a utility's incremental compliance costs to not more than four percent per retail customer annually; an Alternative Compliance Payment (ACP) that was available for utilities that determined they could not meet the program requirements; providing a potential variance if transmission constraints prevent service delivery; and potentially allowing waivers for reasons of Force Majeure.

Key Questions:

- What are the anticipated effects on state and regional electricity prices of a CES structured according to the President's proposal? What are the anticipated net economic effects by region?
- Would other CES formulations or alternative policy proposals to meet a comparable level of clean energy deployment have better regional or net economic outcomes?
- How might various price levels for the ACP affect the deployment of clean energy technologies?
- What options are available to mitigate regional disparities and contain costs of the policy?
- What are the possible uses for potential ACP revenues? Should such revenues be used to support compliance with the standard's requirements? Should all or a portion of the collected ACP revenues go back to the state from which they were collected? Should ACP revenues be used to mitigate any increased electricity costs to the consumer that may be associated with the CES?
- Should cost containment measures and other consumer price protections be included in a CES?
- How much new transmission will be needed to meet a CES along the lines of the President's proposal and how should those transmission costs be allocated?
- Are there any technological impediments to the addition of significantly increased renewable electricity generation into the electrical grid?
- What are the costs associated with replacing or retrofitting certain assets within the existing generation fleet in order to meet a CES?
- What level of asset retirements from within the existing generation fleet are anticipated as a result of a CES?

6. *How would the CES interact with other policies?*

The credit value generated by imposition of a CES may not, by itself, be enough to address obstacles faced by particular clean energy technologies. For example, the deployment of solar panels has raised concerns about land use changes in certain desert areas. Coal with CCS confronts post-closure liability issues and the extraction of the feedstock itself has become subject to increasingly stringent regulatory treatment. For nuclear power, financing new projects has been difficult due to significant, up-front capital costs. All domestic energy development projects face substantial permitting hurdles. Reaching the President's CES target of 80 percent by 2035 will require a diverse set of resources, so technology-specific supporting policies may be necessary.

Key Questions:

- To what extent does a CES contribute to the overall climate change policy of the United States, and would enactment of a CES warrant changes to other, relevant statutes?
- What are the specific challenges facing individual technologies such as nuclear, natural gas, CCS, on- and offshore wind, solar, efficiency, biomass, and others?
- Will the enactment of a CES be sufficient for each technology to overcome its individual challenges?
- Should there be an examination of energy connected permitting?
- Are there specific supporting policy options that should be considered for coal, nuclear, natural gas, renewable energy, and efficiency?
- What is the current status of clean energy technology manufacturing, and is it reasonable to expect domestic economic growth in that sector as a result of a CES?