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The Pacific Northwest National Laboratory is pleased to offer comment in response to the Department of Energy Quadrennial Technology Review Framing Document and Request for Public Comment.

DOE has asked for input on six key questions. While PNNL looks forward to engaging with the Department on all of these questions through the planned workshops and other venues as appropriate, our response here focuses on the last of these questions:

- A number of non-technical barriers – including federal, state, and local regulations, market failures, and non-technical risks – impact the rate of deployment of energy technologies. What if any, role should the Department have in addressing these barriers?

As highlighted in P-CAST's report to the President, *Accelerating the Pace of Change in Energy Technologies Through An Integrated Federal Energy Policy*, the policy environment plays a determining role in the rate of innovation and deployment of new technologies. As DOE's framing document and many years of experience recognize, it is nearly impossible to reliably assess technology readiness or potential impact when the policy environment is complicated, uncertain, and conflicting within and across sectors and geographic regions of our nation. That said, inconsistency and complexity is the central character of the policy environment within which DOE will hold its first QTR.

We appreciate that the QTR must focus on activities within the DOE's purview and that it is not DOE's job to make policy. However, we believe that the Department has an essential leadership role in informing an energy policy that increases innovation and reduces barriers to technology deployment, and that the QTR provides an important and timely opportunity for the Department to develop and provide information that establishes essential policy requirements along these lines.

Specifically, we recommend that the DOE take this opportunity to outline features of a clean energy policy framework that will simultaneously enable President Obama's *Blueprint for a Secure Energy Future, provide an environment in which DOE's six strategies can be effectively executed,* and provide a more certain, transparent and credible basis for assessing the value and readiness of technologies in DOE's portfolio and coordinating its R&D activities with policy for greater deployment success. We anticipate the DOE could do this by asserting key

principles that begin to describe an integrated Federal clean energy policy along the lines envisioned by P-CAST. Those principles would provide a basis for evaluating the technology portfolio in the QTR and offer a point of departure for future discussion with policy makers as federal clean energy policy is constructed.

Shaping the policy dialogue for a Clean Energy Standard

President *Obama's Blueprint for a Secure Energy Future* posits a New Standard for Clean Energy (CES) as the "centerpiece of the Administration's strategy for creating clean energy markets". As described in the President's Blueprint, a CES would give electric power plants clean energy credits for every MWh of electricity they generate from clean energy.

Meanwhile in Congress, Sens. Jeff Bingaman and Lisa Murkowski, Committee on Energy and Natural Resources, have initiated the process of building a CES policy. Their recent white paper raises a host of questions regarding the critical design elements of a successful CES. The answers to some of those questions will centrally affect the execution and success of the DOE's six strategies, and are highly relevant to the scope of the DOE-QTR. For example:

- What resources should qualify as "clean energy" - *i.e., what clean energy technologies would have deployment incentives under a CES?*
- How should crediting systems and timetables be designed - *i.e., when would new technologies need to be ready and at what cost must they be made available to displace a less clean technology as part of a utility's portfolio mix?*
- What is the role for energy efficiency in the standard? - *i.e., should utilities be incented to encourage adoption of building efficiency measures such as those being developed within the DOE programs as part of their portfolio mix?*
- Should partial credits be given for certain technologies…and, what would be the effect of including tiers for particular classes of technologies? – *i.e., will some technologies be differently credited than others and therefore have greater "market pull"?*

PNNL has recently developed a Clean Electricity Standard policy option for consideration by Washington State, and we are currently working with the State legislature to think through its possible adoption. We believe the approach we have put forward is also applicable at the Federal level, and if implemented at both State and Federal levels, would create a true national market for clean energy innovation that far exceeds current public and private efforts.

Building on our work for Washington State, we offer the following general principles for a Federal Clean Energy Standard that would enable the Administration's national energy goals, establish a framework for an integrated Federal energy policy with a major energy innovation focus consistent with the P-CAST recommendation, reduce barriers to technology deployment, and for the first time since DOE was established, provide the basis for a Sustainable Policy to meet our Energy and Environmental Needs. If integrated into the framing of the QTR as a set of Federal energy policy principles or assumptions, a CES designed along these lines would also and importantly provide a consistent point of reference for assessing technology readiness and likelihood of deployment.

At the highest level, a Federal CES that advances energy innovation and clean energy technology deployment should adhere to the following design principles – it should be:

- *Environmentally certain* – credits would be awarded based on meaningful reduction of greenhouse gasses (GHGs) only. If consensus develops around other types of environmental effects, such as spent fuels, these can be accommodated by adjusting credits earned for a particular resource.
- *Technology neutral* – the standard should be based on a general emissions threshold, or Maximum Allowable Emissions without expressly listing qualifying technologies. The latter leads to pre-selecting "winners" and reduces incentives for technological innovation. The emissions limit is lowered over time and the percentage of supply that must be provided below the limit is increased over time.
- *Efficiency friendly* - As emphasized by the Department, efficiency is a strong, low-cost competitor of measures that utilities can take to move towards a more clean and secure energy flow. To that end, a CES should credit advances towards a zero-emissions target, whether on the supply or demand side, awarding credits for emissions avoided as well as emissions reduced.
- *Lowest cost, Lowest burden* - Closely related to the previous principles, the standard should give utilities maximum flexibility in how they move towards a zero-emissions target. Decisions on the mix of technologies deployed and efficiency measures should be made by those closest to the market need and opportunity, giving businesses and institutions that are accountable to the customers served, shareholders and regulators greatest possible flexibility in how they meet the Maximum Allowable Emissions goal.
- *Innovation focused* –crediting only new clean energy resources will result in the greatest investment in clean energy technology and the greatest advancement towards clean energy goals. The standard may need to grandfather resources developed for existing state standards in order to reduce potential losses from investments made to satisfy those standards. However, credits should not include historic clean energy resources that do not "move the needle" in the direction of national clean and secure energy outcomes.

To be effective, a Federal CES must be executed within a substantially less complicated and contradictory policy context than currently exists, but in combination with a minimum few additional policies needed to encourage investment and deployment. The following assumptions would need to hold relative to the relationship of a CES to other energy policy:

- Current Federal subsidies for specific technologies would all be sunset on a defined schedule, but not more than 5 years. These subsidies are contrary to the "technology neutral" principle and discourage a strong, competitive innovation engine.
- Current Federal tax breaks for R&D and Manufacturing should be permanently extended. These research and manufacturing tax breaks motivate broad innovation and tie that innovation to domestic manufacturing and further reduce barriers to deployment.
- Policies that decrease barriers to deployment would be designed within the CES to be compatible with its overall principles - for example, policies needed to address long term liability of CO2 disposal, nuclear waste disposal, or electric infrastructure transformation. These topics could be the subject of a subsequent inter-agency Quadrennial Energy Review along the lines proposed by P-CAST.

As noted above, PNNL is providing a more detailed technical consideration of a Clean Electricity Portfolio Standard policy for Washington State, and we would be happy to further discuss those recommendations with the Department. We are providing technology domain experts into the QTR call and process. And, we stand ready to help the Department advance its strategy and QTR process in any way we can.

Thanks for the opportunity to respond and we look forward to further discussion.

Sincerely,

Michael Kluse
Laboratory Director