The National Clean Energy Smart Grid: An Economic, Environmental, and National Security Imperative

Expanding and upgrading our electric power transmission and distribution system are vital to renewing America's economic growth, strengthening national security, and addressing the threat of global climate change. Specifically, we must make two critical investments in our electric grid: (1) Efficient, secure and reliable interstate transmission networks – incorporating renewable collection lines and extra-high voltage (EHV) backbone facilities – which will enable massive domestic renewable energy resources currently stranded in our country's remote areas to be developed and delivered to population centers; and (2) "Smart Grid" technologies to make the transmission and distribution grid more reliable, resilient, and secure, and to accommodate renewable power and enable more energy efficiency by consumers and businesses. These critical grid investments are complements to – not substitutes for – investments in building energy efficiency, customer demand response, clean distributed generation, and energy storage. At a time of serious economic distress and mounting pressure to address the widespread environmental, economic, and geopolitical consequences of our excessive reliance on fossil fuels, the case for a National Clean Energy Smart Grid has never been stronger.

States and regions across the country have already adopted policies aimed at reducing the carbon footprint of electric power, increasing clean and renewable electric generation, and improving end use energy efficiency. With consideration of new and ambitious national policies on climate change, renewable energy, and energy efficiency to follow, these investments could position the country to secure the benefits of any such initiatives in a timely, efficient and cost effective manner. None of these policies can achieve their goals without rapid and transformative investments in transmission and smart grid resources on a national scale.

Even setting aside the national imperatives for clean energy and climate change, a National Clean Energy Smart Grid will provide huge economic and national security benefits. EHV transmission lines have the potential to dramatically cut line losses and improve the efficiency of the system. Smart grid technologies allow more efficient and dynamic management of electric flows – reducing waste, improving reliability and better accommodating renewable power, distributed generation, demand response, and a broad range of customer-based resources like smart appliances and plug-in hybrid vehicles. Smart meters and two-way communication lay the foundation for a quantum leap in automated demand management and electric grid control that could save consumers and businesses billions of dollars per year on their electricity bills. Digital smart grid technologies would dramatically reduce the grid's vulnerability to cyber attacks and other disruptions, and enhance grid operations.

Why Don't We Already Have a National Clean Energy Smart Grid?

Standing in the way of 21st century energy solutions is a 20th century electric grid – and the increasingly outdated patchwork of policies and institutions that govern it:

- Our existing framework for planning, developing and financing transmission infrastructure is too geographically fragmented, near-term focused, and procedurally cumbersome to support the development of a reliable integrated transmission grid capable of delivering remote renewable resources to load. Participatory and transparent planning at a national scale is essential to addressing national policy goals and maximizing broad societal value.
- Our historic policies for allocating the cost of transmission investments make it exceedingly difficult to identify what projects should be advanced and who should pay for the cost of such investments.
- Most state level processes, by their nature, do not have the scope to recognize regional or inter-regional transmission needs.
- Siting multi-state transmission facilities is a long and contentious process, often involving numerous state and local regulators and Federal lands agencies, each with the power to block an entire project.
- The current process misses opportunities to cooperatively analyze and identify corridors for transmission that bypass sensitive areas.
- Proven and cost-effective smart grid technologies have not achieved significant market penetration due to lack of funding for Congressionally authorized smart grid pilot and demonstration projects, insufficient federal deployment incentives, and state regulatory environments that often provide poor incentives for utilities and customers to invest in smart grid, demand response, and energy efficiency technologies.
- New policies are needed to make grid security a priority, and to coordinate and provide incentives for investments that will rapidly reduce the grid's vulnerability to cyber and physical attacks and natural disasters.

What Policy Changes are Needed to Foster a National Clean Energy Smart Grid?

National policy makers have a unique opportunity to clear the way for large-scale private sector investments in National Clean Energy Smart Grid infrastructure by updating transmission planning, siting, and cost allocation policies, creating incentives for accelerated deployment of a broad range of efficient smart grid technologies, and setting clear priorities for improving grid security. Just as it would have been nearly impossible to build the interstate highway system without federal leadership 50 years ago, creating an interstate electric grid that can support our National vision of a cleaner and more efficient electricity system will likewise require forward-looking leadership by Congress and the President.

Develop New National Scale Transmission Plans to Bring Clean and Renewable Power to Population Centers

Coherent plans for extra-high-voltage transmission, covering the two large multi-state regions of the eastern and western interconnections, are needed to determine how best to connect vast renewable energy resources in remote areas with population centers and integrate them into the existing EHV grid. Specifically, the planning process should:

- Identify essential new transmission resources, including backbone EHV projects, and renewable collection lines needed to support dramatic increases in the penetration of renewable electricity generation while ensuring the efficiency, security, and reliability of the interstate transmission networks.
- Incorporate rigorous and transparent analysis of a comprehensive set of considerations and alternatives, so as to optimize the economic, technical and environmental performance of the grid.
- Involve a broad array of stakeholders, including states, generation developers, transmission owners and developers, environmental interests, consumer interests, and labor, to address concerns up front and avoid snags later in the process.
- Recognize the importance of interstate and inter-regional planning of the transmission system to maximize the integration of renewable resources while ensuring the reliability and efficiency of the grid.
- Take into account analysis and planning already undertaken by states, Regional Transmission Organizations (RTOs), utilities, and others (notably some larger regional initiatives now in progress).
- Ensure that new transmission plans are environmentally responsible by avoiding development on sensitive lands or important natural resources.
- Utilize transmission planning principles to advance national policies on renewable energy, energy efficiency, and climate change.
- Consider innovative technology options, such as use of superconductors.
- Produce new transmission plans that dramatically enhance our capacity to meet steep greenhouse gas emission reduction targets by enabling new renewable energy resources and supporting electrification of the transportation sector (e.g., plug-in hybrid vehicles).

Interconnection-wide transmission planning would be done under Federal authority and according to guidelines and timeframes established by the Federal Energy Regulatory Commission (FERC). States within each interconnection would be invited to collaboratively develop the plans in consultation with RTOs, utilities, and others, and under the oversight of the FERC. Such planning efforts would have access to interconnection-wide ratepayer resources to conduct a participatory, transparent, and analytically robust planning process on an aggressive timeline consistent with meeting urgent national economic, environmental and national security goals.

Make a National Investment in the National Clean Energy Smart Grid

Just as local electric ratepayers currently fund local electricity infrastructure investments, broad based groups of ratepayers should cover the costs of national grid investments which provide broad-based national benefits. This will ensure all beneficiaries of the National Clean Energy Smart Grid support the cost of its development. Broad-based ratepayer support would be limited to: funding a participatory, transparent, and analytically robust planning process; recovering costs of new investments determined to be needed in the comprehensive transmission plans; and incentives and support for broad-based deployment of smart grid technologies on the transmission system. Cost allocation policies should be as simple as possible (e.g., allocating designated costs proportionately to all load in the interconnection) to avoid lengthy regulatory proceedings and provide greater predictability for developers and ratepayers. Clear cost allocation policies will provide transmission developers and investors with the certainty they need to move projects forward.

Consolidate Siting for the National Clean Energy Smart Grid

The patchwork of siting authorities would be consolidated and streamlined for National Clean Energy Smart Grid projects identified in the planning process. Best management practices would be required for siting and construction in order to balance infrastructure requirements with the need to avoid unique and environmentally sensitive lands, optimize use of existing corridors, minimize impacts on private property, and provide wildlife and habitat protection. Project certification and siting for those projects identified in the planning process would:

- Be decided in a single consolidated proceeding conducted by FERC.
- Build on the findings concerning need and appropriate corridors emerging from the planning process.
- Enable state agencies with local expertise to offer input and conditions relating to detailed "on the ground" routing choices and mitigation requirements. Incorporate such state conditions except where FERC finds that a condition conflicts with the National interest in developing the projects identified in the plan.

To properly implement this new siting process, federal, state and local government agencies will require substantially increased resources for data collection, mapping, pro-actively categorizing land for use or avoidance (with stakeholder input), and fast track permitting for pre-approved lands.

Ensure Grid Additions Serve our Environmental Purposes

The planning and siting processes described above are intended to ensure that new transmission projects will advance the policy goal of enabling much greater reliance on renewable energy resources, while minimizing the environmental disruptions caused by building and maintaining new grid infrastructure. Applying an appropriate greenhouse gas emissions standard to new generators connecting to transmission facilities built with the benefit of these special cost recovery and siting provisions would further assure that clean energy infrastructure development

is the result of these policies. Emissions-related restrictions on generators interconnecting with new grid facilities must not interfere with the operational reliability of the grid, and must accommodate the need for dispatchable resources to balance variable renewable resources.

Create New National Incentives for Investments in Smart Grid Technologies

While Congress recognized the importance and promise of smart grid technologies in Title XIII of the Energy Independence and Security Act of 2007, federal incentives are needed to accelerate investments in a broad suite of smart grid technologies that allow for dynamic management of electric flows and better integration of diverse energy resources, allow two-way flow of electricity and information, digitize our electrical system controls, and improve management of everything from power plants to home and office energy use. In order to accelerate the deployment of smart grid technologies, Congress should:

- Increase the authorization for the Smart Grid Regional Demonstration Initiative and the Smart Grid Investment Matching Grant Program, and fully fund these programs.
- Fully fund the development of an interoperability framework for smart grid devices and systems, and establish national policies that ensure state governments adopt these standards.
- Provide a 30% investment tax credit for smart grid technologies.
- Reduce the tax depreciation life for smart meters and smart distribution grid technologies to five years.
- Fund a basic national network of time synchronous measurement/monitoring devices to provide the foundation for monitoring grid performance at a national level, and drive optimal smart grid investments and transmission siting for the future.
- Provide homeowners and small businesses with rebates and tax incentives that encourage the purchase of smart grid enabled energy management systems.

Make Grid Security a Priority

Computers controlling the electric power grid are vulnerable to hostile or malicious intrusions. The cybersecurity of the U.S. electric system is a key issue for national security, and enhanced protection is an urgent matter for the civilian economy and for Defense Department (DOD) installations dependent on the grid for electric power. Hardening the grid to terrorist attack, and using technology to better monitor and manage electricity flows and make a more adaptive and self-healing energy grid, should be top priorities, justifying additional grid investments. The security priority should be codified in new national policies, including appropriate federal regulations, incentives and cost recovery policies.