ADVANCED ENERGY ECONOMY
the business voice of advanced energy

Modernizing U.S. Energy Infrastructure to Grow Our Economy

Harnessing all energy technologies can improve American infrastructure and achieve economic prosperity

Rebuilding American infrastructure is rightly a priority for the Trump Administration and the U.S. Congress. It is well documented that our nation's roads and bridges are old and failing, but the same is true of our energy infrastructure — a system we all depend on to grow our economy. Congress and the Administration should focus on the electric power system as a key element of infrastructure modernization to accelerate economic growth. In recent years, spending on electricity transmission and distribution has been increasing, but power outages have not decreased, costing the economy billions of dollars annually. To address this challenge to our lifestyle and our economy, the full power of advanced energy technologies should be brought to bear in an infrastructure modernization plan to increase grid reliability at lowest cost to consumers.

Here are five ways federal policy can reduce regulation and encourage private investment to modernize our nation's energy infrastructure:

1. STREAMLINE REGULATIONS TO PROMOTE ADVANCED ENERGY DEPLOYMENT

Congress and the President have indicated their interest in putting private capital to work in modernizing our infrastructure. Legislation – most notably the Fixing America's Surface Transportation (FAST Act) of 2015 – and executive orders have emphasized the development of priority infrastructure projects, including energy projects, by increasing coordination between federal agencies and streamlining the process of regulatory oversight.

Better coordination at the federal, state, and local level can accelerate deployment of advanced energy projects in the United States. These projects help modernize the power grid, encouraging investment in innovative and flexible technologies that will bring jobs to all parts of the country while building a more dynamic and responsive electric power system.

While current laws and regulations were written with traditional energy technologies in mind, new policies are needed to ensure that advanced energy technologies can compete as we modernize our energy infrastructure. Congress should pass legislation to allow advanced energy projects to enjoy equal treatment. Specifically, Congress should:

- **Grant FERC federal "backstop" authority for FAST Act infrastructure transmission projects.**

FAST Act transmission projects are key to the development of a modern electric grid. They allow the country to tap domestic energy resources while bringing private investment into local economies and spurring job growth. However, current rules do not allow electric transmission projects to receive expedited review. State review of smaller projects works well, but current processes can significantly impede the approval of interstate transmission projects in the national interest. To ensure that FAST Act interstate transmission projects can be completed on a timely basis, Congress should grant the Federal Energy Regulatory Commission (FERC) federal backstop siting authority for these projects.

- **Enhance coordination and establish non-binding targets to reduce permitting time for advanced energy projects to 24 months from the current average of 70 months**

Advanced energy resources such as wind, solar, geothermal, advanced nuclear, and high voltage transmission typically require extensive permitting by federal and state agencies. At the federal level, this includes permits and environmental reviews under a variety of laws and with involvement of numerous federal agencies. Permitting these projects can take years, leading to delays and significant higher costs for projects that ultimately reduce the environmental impact of U.S. energy use. Congress should prioritize reform of environmental review specifically to reduce the time of permitting for advanced energy projects.

2. MAKE USE OF ADVANCED TRANSMISSION TECHNOLOGIES AND NON-WIRES ALTERNATIVES IN GRID MODERNIZATION

Our energy system is going through a transformational change – evolving consumer preferences, dynamic new technologies, and aging infrastructure have created the urgent need to modernize the electricity system. As these changes occur, grid operators and planners must ensure that cost-effective solutions are used to keep the lights on and prices low for consumers.

Cost-effective transmission is an essential part of a secure, clean, and affordable energy future. In many cases, investment in transmission infrastructure is necessary to maintain reliability and bring new generation resources, including advanced energy resources, to population centers with high demand, as well as relieving congestion chokepoints that can disrupt delivery of reliable electric service to customers.

At the same time, alternatives to traditional transmission ("non-wires alternatives," or NWA) can frequently meet the needs of customers and the utility system at lower cost. They deserve equal consideration for solving problems in power delivery.

Unfortunately, transmission planning has not kept pace with technological change. To address grid congestion and reliability at a lowest cost, Congress should pass legislation to allow for all technologies to be considered in transmission and modernization projects:

- **Encourage greater consideration of advanced transmission and non-wires alternatives by requiring FERC to collect data and report metrics regarding the use of NWA and other advanced energy technologies in transmission planning.**

Existing or new transmission can be made more effective by using advanced grid technologies such as voltage and volt-ampere reactive optimization, advanced power flow control, dynamic line rating, advanced conductors, or topology control. Similarly, non-transmission alternatives can also save consumers billions in avoided costs by deploying technologies such as energy storage, advanced microgrids, combined heat and power equipment, distributed generation, energy efficiency, demand response, advanced distribution management systems, and smart inverters and transformers. Investments in these advanced energy technologies can more efficiently deliver electricity to consumers and reduce unnecessary buildout of transmission.

The Energy Policy Act of 2005 encouraged the deployment of advanced transmission system technologies, but to date, these technologies have faced market barriers to adoption. Collecting data and report metrics on how frequently advanced grid technologies and NWAs are chosen in grid planning would provide market transparency into how these technologies compete against traditional investments.

3. SUPPORT LOCAL INFRASTRUCTURE MODERNIZATION

Qualified Infrastructure Bonds

To support the deployment of public-private partnerships for publicly owned end-use energy infrastructure, the federal government could offer a new taxable bond program for state and local governments to leverage private financing. A Qualified Infrastructure Bond (QIB) program could provide taxable bonds, as an alternative to tax-exempt bonds, to help the private sector finance state and local investments in public infrastructure. Congress should pass legislation to:

- **Enable taxable Qualified Infrastructure Bonds, allowing the private sector to finance state and local public infrastructure projects.**

A Qualified Infrastructure Bond would be a new category of bonds issued by state and local governments (such as states, cities, counties, territories, Indian tribal governments, or any political subdivision thereof) whereby the federal government would provide a direct payment to the public entity on a percent of the interest payable on the bonds. The direct payment incentive would result in

a significant leveraging factor in the ratio of public versus private capital investment. The QIB program would attract private financing for energy infrastructure, including but not limited to energy conservation projects in buildings and facilities, facility renewal, energy generating assets, energy storage, distributed generation, microgrids, and other advanced energy systems.

Port Facility Upgrades and Shore Power Electrification

U.S. ports require upgrades and expansion to remain competitive internationally but face challenges due to concern from citizens over additional pollution from diesel generators. Electrification of ports and port equipment offers cost savings and greater efficiency while reducing local air pollution. Electrified terminal cranes and automated terminals can lead to significant cost reductions. Several ports, such as Long Beach and Los Angeles, are making use of new technologies and terminal upgrades, as expansions designed for 21st century container ships focus on port electrification and shore power. Shore power that connects to the electric grid reduces pollution and provides reliable energy for ships while docked.

For U.S. ports to remain competitive worldwide, modernization and electrification of ports will be essential. Congress should:

- **Require recipients of federal funding or competitive grants for upgrades at U.S. ports to consider port electrification and shore power.**

4. ACCELERATE ELECTRIFICATION OF TRANSPORTATION

Traditionally, discussion of transportation infrastructure is limited to upgrades of roads and bridges, and such upgrades are desperately needed today. However, a modernized transportation system must also capitalize on the numerous benefits of vehicle electrification. Effective policies can accommodate and accelerate electrification for the benefit of all forms of transportation, including public transportation and ports and airports, at the same time supporting the evolution of a cleaner, more flexible power grid.

To advance a modernized transportation system that embraces electrification, Congress should do the following:

- **Amend federal law to allow electric vehicle charging stations at interstate highway rest stops.**

Sales of plug-in electric vehicles (EVs) have grown at a compound rate above 50% annually since 2011, and more rapid growth is expected in the future. Major auto manufacturers now offer a variety of passenger EV models, and with battery costs – the major barrier to purchase price parity – dropping rapidly, all major automakers have plans to introduce a full range of models. Despite

growing demand, the shortage of charging infrastructure remains a roadblock to greater adoption of EVs. Lack of charging stations feeds "range anxiety" among consumers concerned about not being able to charge their vehicles on long trips.

Currently, federal law intended to prevent the commercialization of these public facilities stands in the way of EV charging station buildout at interstate highway rest stops. Removing this barrier to infrastructure investment would allow private companies to install new charging stations where passengers need them the most, thus enabling more rapid growth in this rising transportation option.

- **Create Incentives for private companies to build electric vehicle charging infrastructure in national priority corridors.**

A federal financial incentive (e.g. rebate) program could leverage private capital to invest new EV charging infrastructure in high priority locations. A federal incentive to invest in priority corridors can lead to private financing of the vast majority of the cost of new infrastructure, minimizing the expenditure of public dollars. A program to deploy new charging infrastructure along major interstate highways in a carefully planned fashion encourages competition among all vehicle and fuel types, improves national security, and facilitates the type of business innovation that enhances American competitiveness. Legislation can build upon the Federal Highway Administration's commitment to work across the federal government and with the private sector to develop a national network of charging corridors supporting electric, hydrogen, propane, and natural gas vehicles. Doing so would reduce range anxiety and facilitate market acceptance of EVs, thus driving further private development of infrastructure to service the growing fleet of vehicles.

- **Promote alternative financing mechanisms to accelerate adoption of electric vehicles.**

The FAST Act created an opportunity for transit agencies to save money in vehicle purchases through alternative financing mechanisms. Transit agencies can lease battery storage systems, allowing them to finance the cost of the batteries through operational savings. Federal support of financing mechanisms can encourage agencies to take advantage of the benefits of these options.

Additionally, low interest financing options can unlock private investment for a variety of electric vehicles, including heavy duty models. Low interest financing supports a public-private partnership where federal investments can lead to substantial private sector investments.

- **Expand funding for low- or no-emission vehicle programs for transit buses.**

The 2015 FAST Act currently appropriates $55 million through FY 2020 to the Low or No Emission Vehicle (Low-No) competitive grants program. This program provides much needed funding to state and local governmental authorities for the purchase or lease of zero-emission transit buses. In Fiscal

Year 2017 alone, the program received over $500 million in grant requests, demonstrating a strong demand at the state and local level for the Low-No program and the need for the federal government to increase funding for this successful program. The March 2018 budget deal increased funding for the Low-No program by nearly $30 million, but more long-term and consistent funding for this program is needed to meet demand. The Low-No program has helped finance the purchase or lease of more than 150 advanced technology buses, allowing transit agencies across the country to cut operating and maintenance costs, reduce pollution for cleaner air, and deploy an innovative technology.

The Low-No program invests public dollars while utilizing private capital to enhance the overall value of the program. As a competitive grant process, state and local entities must demonstrate why they should be awarded federal dollars. The program also encourages public-private partnerships as private companies work directly with state and local agencies to deploy low and zero emission electric buses. As an additional benefit to the program, it also helps finance battery storage, supporting increased usage of this advanced technology, which can also be used in combination with advanced energy technologies, such as wind and solar.

5. PROMOTE ENERGY EFFICIENCY

Energy efficiency technologies and services can play a key role in modernizing America's infrastructure. The energy efficiency sector has developed unique financing tools to help customers – including schools, businesses, and governments agencies – save money, reduce waste, and improve energy productivity. More can be done to unlock billions of dollars in private financing to upgrade facilities with more energy efficient equipment, enhance the performance of the overall grid, and – most importantly – reduce the cost of energy.

Congress should take the following actions on energy efficiency in infrastructure:

- **Support the use of Energy Savings Performance Contracts (ESPCs) and Utility Energy Service Contracts (UESCs), so that the federal government can partner with the private sector to improve the efficiency of federal facilities through innovative financing.**

The federal government should continue to leverage billions of dollars in private financing to achieve improvements across federal facilities, such as government buildings, schools, and hospitals, via Energy Savings Performance Contracts (ESPC) and similar utility-run offerings, Utility Energy Service Contracts (UESC). Federal agencies have successfully leveraged $5 billion in ESPCs and UESCs over the past five years to achieve energy cost savings through infrastructure upgrades and facility repair. The federal government should leverage at least $10 billion in these contracts through 2024, which will deliver $10 billion in improvements and $14.2 billion in additional cash savings to the federal government. To strengthen accountability for federal infrastructure investment, we recommend

establishing energy and infrastructure leads at each agency and oversight from the Executive Office of the President.

Further, the President should take the opportunity to issue a Federal Executive Order that would encourage agencies to maximize the use of ESPCs. Agencies should consider all measures to reduce the energy and water waste and improve the resilience of their facilities, incorporate distributed generation for energy security, and otherwise ensure that agencies take opportunities to achieve their missions and reduce their costs through private sector financing and expertise.

- **Leverage private capital through public-private partnerships for facility renewal, infrastructure upgrades, and new technology to modernize rural, urban and suburban schools.**

Congress should take action to prioritize support for consortia of schools and school districts that look for performance guarantees in making facility upgrades and efficiency improvements. It can do so by promoting competitive procurement of all utilities through a school district consortium similar to Michigan Schools Energy Cooperative (MiSEC) and Pennsylvania Public Entity Energy Consortium (PPEEC). Consortia bidding is the most efficient and cost-effective way for schools to meet their energy needs and devote the most resources to the purpose of education.

Conclusion

Access to affordable and reliable electricity has been a hallmark of economic growth in the American economy. The electrification of America during the 20th century enabled this growth, and energy innovation still presents an opportunity today. As the President and Congress set about the task of upgrading the country's infrastructure for the 21st century and beyond, modernizing energy infrastructure deserves consideration among the nation's priorities.

AEE's policy recommendations present opportunities to use advanced energy technologies to modernize our energy infrastructure for electric power, buildings and facilities, and transportation. These policies embrace the Trump Administration's emphasis on leveraging private capital by reducing barriers to investment for American energy resources. As a $200 billion industry supporting more than 3 million jobs across the United States, the advanced energy industry is ready to work with the Administration and Congress to modernize our energy infrastructure for a 21st century economy.