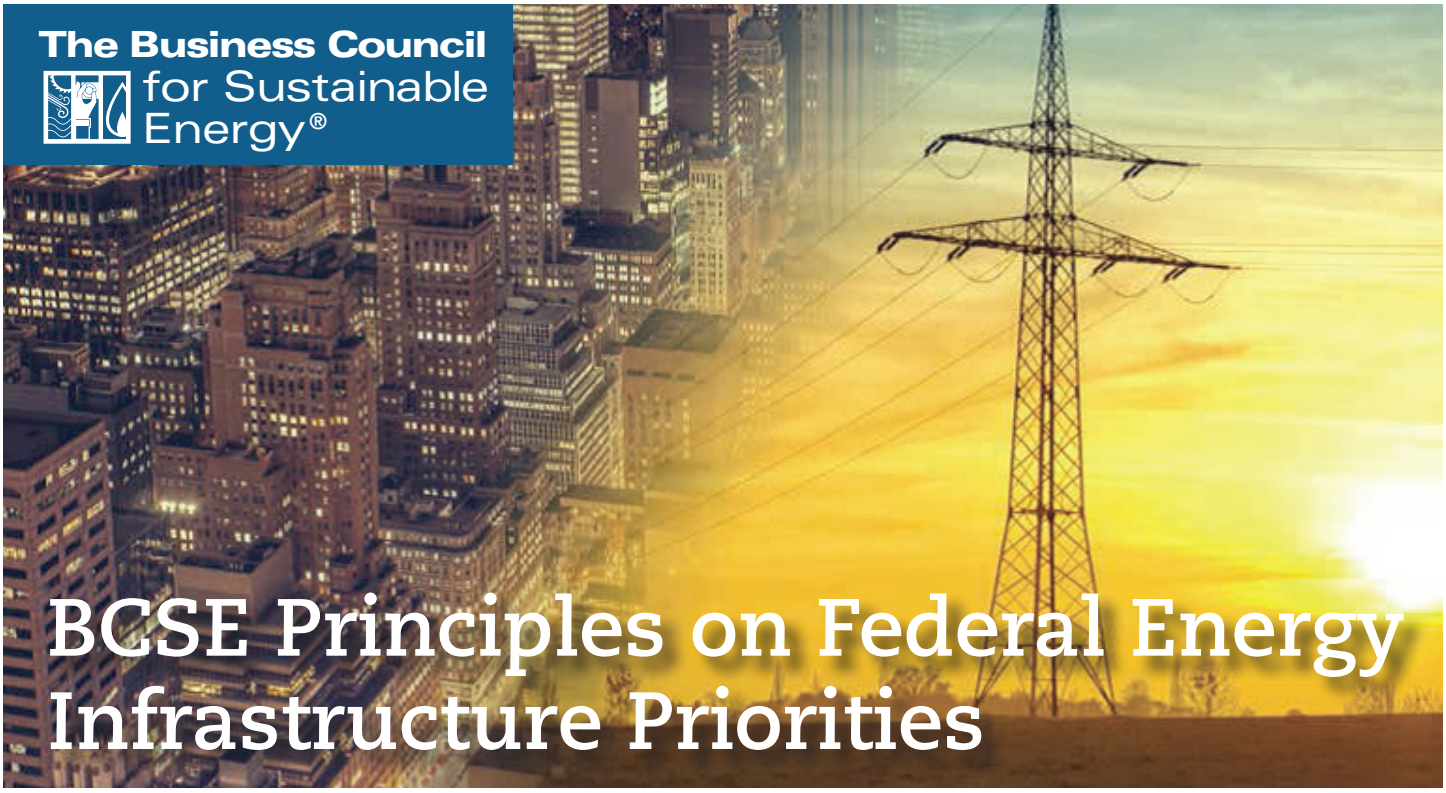
The Business Council for Sustainable Energy®



BCSE Principles on Federal Energy Infrastructure Priorities

This document outlines the Business Council for Sustainable Energy's (BCSE) principles for federal energy infrastructure proposals and initial recommendations for consideration by the Trump administration and 116th Congress.

The Challenge and the Opportunity

Energy powers our lives and is at the heart of the U.S. economy.

The extensive power grid and natural gas system in the U.S. have fueled the nation's economic growth and ensured its global competitiveness.[1] However, the country's energy infrastructure lacks the required attributes necessary to meet the demands of the 21st century. As the U.S. economy becomes more digitally driven, energy infrastructure that is reliable, affordable, smart, and resilient becomes even more critical.

It is estimated that the U.S. has a $5 trillion gap in funding for infrastructure investment between now and 2040. This includes a gap of over $565 billion needed in additional energy infrastructure spending alone.[2]

Even with electric and natural gas utilities spending hundreds of billions of dollars annually on infrastructure, a large funding gap still exists.[3]

The United States is one of the most attractive markets in the world for companies whose operations entail significant energy-related costs.

To address this gap, the public and private sectors must work together to update market rules and to establish modern policy frameworks. This must include competitive market structures that facilitate long-term planning and infrastructure investment and maintaining support for energy efficiency.

This collaboration is essential for the delivery of affordable, reliable, and clean energy products and services to businesses and households. It is also vital to the operation of other critical infrastructure systems, including security, water and waste management, transportation, communications, the built environment, and industrial sectors.

BCSE Principles for Federal Energy Infrastructure Proposals

- **Upgrades and Investment in U.S. Infrastructure Have Broad Bipartisan Support:** Investment in U.S. infrastructure will improve U.S. economic competitiveness, will increase our national security and resiliency, and has the potential to create tens of thousands of jobs.

- **The Energy System Is Critical Infrastructure:** Reliable and secure energy systems power the U.S. economy and sustain other critical infrastructure systems. Transportation, water, lighting, and security systems will see dramatically increased electrification in the decades ahead, putting more demand on the U.S. energy system while simultaneously creating an opportunity to incorporate more secure, resilient, smart, and efficient energy infrastructure additions.

- **Municipal Facilities Are a Significant Part of the Infrastructure Fleet:** Municipal facilities are generally long-term investments and include assets in the transportation, lighting, water, waste, and energy sectors and provide vital services to their communities.

- **Criteria for Infrastructure Investments Should Consider Multiple Objectives:** Investment decisions should reflect overarching objectives including resource efficiency, consumer savings, environmental performance, resiliency, and sustainability. Projects also should optimize design, construction, and operation for resilience, and incorporate—to the extent possible—the use of third parties to ensure that projects meet their performance objectives.

- **Energy Infrastructure Includes Pipelines, the Electric Grid, Buildings, Lighting Systems, and the Technologies That Connect and Optimize the Energy System:** The next-generation energy system will be bi-directional and much more integrated with the built environment, which will increasingly enable customers to interact with it.

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This will require smart infrastructure solutions—backed by improved cybersecurity protocols—that facilitate the collection of data via sensors along distribution networks, advanced analytics, and the incorporation of communications technologies to optimize performance, preempt problems, and allow for rapid response. The next-generation energy system will also need to integrate demand-response protocols for increased electric grid efficiency, as well as utility-scale and distributed renewable and clean energy technologies, which will require upgrades and expansion to the grid system. Energy storage will also play a larger role in the power, buildings, and transportation sectors. Lighting systems represent 20 percent of U.S. energy use, and upgrading outdoor lighting systems can result in significant cost savings while providing other security, connectivity, and efficiency services. Through more strategic and systemic approaches to modernization, the U.S. can integrate complementary assets, advance new market structures, and accelerate deployment of clean energy technologies.

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To ensure the responsible use of taxpayer dollars, federal funding for the construction and renovation of schools, hospitals, state and local buildings, and other projects should require energy efficient and resilient building construction practices, as well as performance metrics.

- **New and Renovated Buildings Should Avoid Locking In Long-Term Energy Waste:** To ensure the responsible use of taxpayer dollars, federal funding for the construction and renovation of schools, hospitals, state and local buildings, and other projects should require energy-efficient and resilient building construction practices, as well as performance metrics. These measures will ensure that wasteful energy systems are phased out and replaced with cost-effective technologies and practices. As examples, smart capability should be added when renovating HVAC systems to only heat and cool when needed, lighting systems should be upgraded to include LEDs that can control the amount of light needed (using the connected lighting infrastructure to collect data to improve the worker productivity and overall energy efficiency of buildings) and measures such as electric vehicle charging stations and energy storage should be considered.

- ***Integration of Energy Technologies Is a Market Trend:*** In buildings, campuses, micro grids, and cities, multiple energy technologies are being used to enable more efficient production, distribution, and use of energy. Information and communications technology (ICT) is a key bridge to the integration of technology and energy management.

- ***Cross-sector Interactions Permeate the Energy Infrastructure Discussion:*** Energy infrastructure is closely integrated with sectors other than energy. In particular, transportation, water, waste, and the built environment overlap significantly with energy. The water sector is a large energy consumer[4] and, due to aging infrastructure, could see significant energy savings through the use of leak detection, pressure monitoring technologies, and electricity generation onsite. Transportation is becoming more diversified; fueling stations will be needed for alternative-fueled vehicles, hydrogen for fuel cell electric vehicles, and propane and biogas for natural gas vehicles. Related infrastructure also will be needed for battery electric vehicles, which will need to be integrated with the power grid. Buildings also are increasingly becoming grid-integrated. Further, a thriving economy relies on the country managing its waste in a cost-effective and efficient manner. To assist with that objective, there is a significant opportunity to generate renewable energy at waste management facilities.

- ***Information and Communications Technology and Cybersecurity Should Be Approached Proactively:*** As the US energy system becomes more interconnected, paying attention to issues of cybersecurity is paramount. A smarter energy system is one that facilitates two-way communication in real time through the use of advanced sensors, communications networks, and data management platforms. This enhances overall performance and decrease costs for generators, distributors, operators, and consumers. This also means that there is an increasing need to emphasize cybersecurity and secure communications networks as connectivity and remote management of key energy assets grow.

What Is Needed

The BCSE asks that the Trump administration and Congress consider the following recommendations when looking at infrastructure decisions.

- **Siting, Permitting, and Regulatory Reforms Should Be Key Components of Federal Action on Infrastructure:** Streamlining of siting and permitting processes for electric grid, electric transmission, natural gas pipelines, power generation, hydropower projects, energy storage, and materials management are critical for infrastructure investment.[5] Further, federal government leadership is needed to promote and adopt policies that foster effective transmission and infrastructure planning. This includes ensuring that clean energy projects can be developed by implementing workable regulations for federal land management, wildlife, military, and aviation interactions. Despite well-intentioned efforts to achieve balance between conservation and energy goals, development is being severely hindered by unworkable rules that do not sufficiently contain legal risk for investors or provide sufficient clarity. Investors require clear rules with manageable risks.

- **Targeted Federal Funding, Including Tax Policy, Should Be Used to Significantly Leverage Private Sector Investment:** Establishing mechanisms and instruments that unlock and leverage private capital for infrastructure investments is an appropriate role for the federal government. Solutions that spur lower-cost financing such as loan guarantees or bonding authority for projects are needed. This can be achieved through the tax code, infrastructure banks, or other means. For some sectors, research, development, and deployment funding will be needed. The Trump administration and Congress should look at past and current initiatives and focus on what has been efficient and effective. As mentioned above, federal funding also can be leveraged by targeting the vast array of municipal infrastructure projects that contribute to the resiliency of our communities.

  - ***Proposals to lift the budget sequestration on federal tax incentives for private investment in America's public buildings should be considered.*** Currently, tax incentive programs—Build America Bonds, Qualified School Construction Bonds, Qualified Zone Academy Bonds, New Clean Renewable Energy Bonds, and Qualified Energy Conservation Bonds—are subject to sequestration (6.2 percent for FY 2019) through fiscal year 2024. The sequester effect on these bonds unduly affects state and local government issuers, and it should be lifted. Further, existing tax incentive programs should be modified to support a new federal tax credit bond for resiliency infrastructure to harden critical public facilities from the effects of natural disasters and cyberattacks.

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- ***There is significant growth potential that can be gained by a reinvestment in the federal hydropower fleet.*** The federal hydropower system makes up approximately 50 percent of total U.S. hydropower capacity.[6] Funding should be directed to support the Army Corps of Engineers Civil Works and the Bureau of Reclamation efforts to operate, maintain, and upgrade their existing hydropower

projects, as well as to build on their existing non-powered infrastructure.

- ***Municipal facilities make up a significant portion of infrastructure assets, and proposals should consider investment and support in municipal infrastructure projects.*** Long-term investments in transportation, lighting, water, waste, and energy infrastructure are crucial to maintaining the viability and service in the communities that municipal facilities serve.

- **Facilitating Regional and Local Planning and Action Is Crucial:** Much of the decision making on infrastructure is dependent on regional planning and local action. Cities (particularly those that own or manage infrastructure assets) are uniquely positioned to evaluate new practices and technologies, and federal infrastructure approaches should include support for such activities at the city scale. The federal government should provide resources to state, local, and regional decision makers to identify the needs and facilitate long-term planning and funding strategies. For example, some states are not as far advanced in their grid modernization efforts as others. Technical assistance and sharing of best practices can help decrease this gap and allow for realization of the benefits of a fully modernized and more efficient grid. Of note, public-private partnerships and challenge grants can assist with planning for conventional and emerging technologies alike.

- **Federal Support for Building Energy Efficiency Should Remain a High Priority:** With buildings accounting for over 70 percent of U.S. electricity demand, over 30 percent of U.S. natural gas demand, and about 40 percent of U.S. energy consumption, the energy infrastructure spending gap is also addressed through improved building energy efficiency.

  - ***Building energy codes and appliance standards are key federal policies, which have enjoyed bipartisan support for decades.*** By ensuring minimum standards in new construction and appliances and equipment installations, codes and standards effectively build energy efficiency into structures. In the case of building energy codes, these cost-effective efficiency measures will generate savings for the life of the structure. Building energy codes also contribute positively to resilience efforts by improving the habitability and productivity of residential and commercial structures, respectively, following outages. For existing buildings, energy efficiency retrofits, backed by an investment-grade audit and evaluation, can significantly reduce utility costs.

  - ***Financing is often cited as a key barrier when retrofits are being considered by building owners and managers, but market-based alternatives now exist to attract and leverage private capital.*** Energy Savings Performance Contracts (ESPC) are an established and widely accepted private financing mechanism that is widely used to alleviate capital costs especially in the federal, state, municipal, education, and healthcare sectors. Since 1998, more than $6.1 billion has been invested in federal energy efficiency and renewable energy improvements thru ESPCs. These improvements have resulted in more than 557 trillion Btu in life cycle energy savings and about $14 billion in cumulative energy cost savings for the federal government.[7] State and local government Property-Assessed Clean Energy programs have leveraged $883 million since 2010 for commercial building retrofits and over $5.1 billion for residential projects, and both have cumulatively led to over 55,000 new jobs.[8]

- **Initiate a National Lab Program for Developing Resilient Building Policies:** It is important to develop effective best practices and policies that will address our increasingly vulnerable building infrastructure. The National Labs play a crucial role in research and development of technology and standards that are critical for building infrastructure. Congress and the Administration should direct the National Labs to focus on developing and testing the materials and installation practices necessary to withstand dangerous weather

events and other resiliency challenges. There is also a leadership role for the National Labs in researching and assessing cybersecurity threats. As buildings and other energy sector assets become more connected, the potential for domestic and foreign interference and system breaches causing widespread disruptions and outages rises at an alarming rate. The National Labs are uniquely qualified to work with federal and private sector stakeholders to better understand the threats and trends in cybersecurity.

- **Appoint a High-Profile Infrastructure Post to Ensure That Federal Agencies Follow the Direction from Congress.** The effectiveness of changes to federal energy infrastructure requires the authority and follow-through at the highest levels of the Administration. Creating a high-level infrastructure post sends the message that energy

The Trump administration and Congress have an unprecedented opportunity to help improve our nation's aging infrastructure. Through public-private partnerships, siting, permitting, and regulatory reforms; targeted research, development, and deployment investments; and financing tools that leverage private capital, the federal government can upgrade and expand U.S. infrastructure and create well-paying jobs for Americans.

Endnotes

1. At 6.88 cents per kilowatt-hour and less than $4 per million btus respectively, the retail prices of electricity and natural gas for the industrial sector in the U.S. are lower than those in other major economies, such as Germany, China, and India. The public and private sector are capturing the benefits of these lower energy prices while the comparative advantage in energy pricing is boosting investment and creating jobs. See BCSE and Bloomberg NEF's *Sustainable Energy in America Factbook.* (February 2019), at www.bcse.org/factbook.
2. See American Society of Civil Engineers Failure to Act Report (2016), at www.infrastructurereportcard.org.
3. On average, the electric power industry invests $100 billion per year to build smarter energy infrastructure and to transition to even cleaner generation sources. A record $117.8 billion in investments is estimated in 2016 (see Edison Electric Institute, *Electric Perspectives* Magazine, July/August 2016, p. 15). Further, natural gas utilities spend $22 billion annually to help enhance the safety of natural gas distribution and transmission systems. The industrial sector is expected to invest more than $100 billion over the next half decade in response to natural gas supply growth. (See the Natural Gas Supply Association's *Winter Outlook 2016–2017*).
4. According to the U.S. Environmental Protection Agency, 3 to 4 percent of national electricity consumption, equivalent to approximately 56 billion kilowatts, or $4 billion, is used to provide drinking water and wastewater services each year). For many municipal governments, drinking water and wastewater plants typically are the largest energy consumers, often accounting for 30 to 40 percent of total energy consumed. Overall, drinking water and wastewater systems account for approximately 2 percent of energy use in the United States. See https://www.epa.gov/sustainable-water-infrastructure/water-and-energy-efficiency-utilities-and-home.
5. Models for consideration include the bipartisan Public Land Renewable Energy Development Act S.1407 and eliminating the infrastructure development uncertainty caused by the Council on Environmental Quality's greenhouse gas guidelines.
6. Bureau of Reclamation (14,112 megawatts, 18% of U.S. capacity), Army Corps of Engineers (20,959 MW, 26%), and Tennessee Valley Authority (3,619 MW, 5%).
7. See U.S. Department of Energy's Federal Energy Management Program at https://www.energy.gov/eere/femp/awarded-doe-idiq-energy-savings-performance-contract-projects.
8. See PACENation's Market Data at http://pacenation.us/pace-market-data/.
9. The FAST Act permitting dashboard.