



Principled Approaches to Federal Infrastructure Investment

Closing the energy infrastructure investment gap with clean energy

As the Administration and Congress consider options and actions to invest in America's infrastructure, Citizens for Responsible Energy Solutions (CRES) Forum recommends the following key principles:

- **Establish clean energy as a strategic priority.** With the help of federal investment, utilities, states and municipalities stand to lower their costs and increase economic development. Furthermore, looking at water and transportation projects with an eye on energy generation or energy efficiency can help make the project or investment more economically viable or profitable. For example, it is possible to add generating capacity to thousands of dams used only for water control that could provide power and jobs across rural America.
- **Maximize public-private partnerships.** Leveraging the private sector to make the most of each taxpayer dollar helps generate revenue for states and take advantage of the private sector's innovation, growth, and efficiencies.
- **Streamline permitting and promote early environmental review.** Instead of focusing on an arbitrary definition of "shovel-ready" projects, federal efforts should identify means for streamlined permit reviews and promote early environmental impact assessments for compliance with the National Environmental Policy Act.
- **Consolidate funding mechanisms and empower states.** The current landscape makes it difficult and costly to navigate funding projects for infrastructure. Federal programs should defer to state decision-makers and focus on outcomes to increase accountability and autonomy.

Background

Across the U.S., infrastructure is aging and in need of repair or replacement. This creates a major opportunity to improve on energy efficiency, add energy generation to existing assets like dams and water systems, and increase the reliability of our energy system. Despite this well-known need, [state and local infrastructure spending reached a 30-year low](#) in 2016 and much of the decline can be attributed to federal spending on infrastructure decreasing by half in recent decades. [The U.S. Conference of Mayors](#) has requested that an increase in direct funding and support should not be limited to roads, airports, and bridges, but should also be expanded to water, ports, and energy infrastructure. The energy sector is in particular need for investment and re-investment. For example:

- [The average age of the 90,580 dams in the U.S. is 56 years](#), with the number of high-hazard potential dams increasing to 15,500 in 2016. The repairs required to extend the use of these dams is estimated to be \$45 billion.
- The mileage of distribution natural gas pipelines [increased by 42%](#) from 1990 to 2015 as natural gas consumption has increased by over 25%. The pressing concern is the 46% of all current high-pressured transmission pipelines that were built in the 1950s and 1960s.
- Most electric transmission and distribution (T&D) lines were constructed in the late '50s and '60s with a 50-year life expectancy. Furthermore, these lines are not optimized for distributed energy resources (DER), such as solar and wind. The [cumulative investment gap for T&D infrastructure is \\$177 billion](#) from 2016 to 2025.

Federal proposals have aimed to invest \$200 billion of federal funding to incentivize an additional trillion dollars of non-federal funding primarily through state matching and public-private partnerships (PPPs). Currently, no existing federally funded program successfully attracts non-federal funding to that scale—the most effective of which is the Clean Water State Revolving Fund, [attracting a total of \\$118 billion off \\$41 billion](#) in federal investment in 2016.

To maximize the value of applied federal funds and ultimately draw a higher multiple of private investment, CRES Forum recommends a strategic focus on clean energy, well incentivized public-private partnerships, streamlined permitting and early environmental reviews, and consolidating funding streams and empowering states.

CRES Forum Recommendations

Clean Energy as a Strategic Priority

Refocus on Federal Nexus and Prioritize Clean Energy

To further narrow the scope of infrastructure projects that qualify for Federal funds, the Administration and Congress should focus on projects with a strong federal nexus. Interstate highway, waterway, energy transmission, and waste-water projects all contribute to local and national economic growth. While the Federal government should provide resources for state and local entities to complete local projects, this should mainly occur with the implementation of state-level programs.

The energy sector represents [approximately 9% of the U.S. economy](#), yet an aging grid and natural gas transmission system, lack of strategic planning to modernize the grid for advanced distributed generation and storage technologies, and a lack of efficient funding mechanisms threaten to destabilize these foundational resources upon which our economy depends.

[In 2015, 40% of additional power generation](#) came from natural gas and renewable systems, and the 640,000 miles of nationwide high-voltage transmission lines are at full capacity. To meet the new demand of electricity from renewable sources, predictability of financing for these large-scale projects, FERC approval, and utility buy-in will all be necessary. The growth of the clean energy sector overall has presented an opportunity to invest in high-impact projects. Since 2008, the installed capacity of solar and wind rose five-fold to 123GW in 2016, indicating massive availability of shovel-ready projects.

Clean Energy Nexus: Clean Energy as a Cross Cutter in Existing Funding Mechanisms

As the Administration and Congress consider options and actions to invest in America’s infrastructure, CRES Forum recommends that clean energy be viewed as cross-cutting investment. Projects with primary benefits in water and transportation often have substantive energy generation or savings components that can help make the project or investment financially sustainable. Examples of how clean energy can link into existing federal infrastructure investment mechanisms are below.

Existing Federal Infrastructure Investment Mechanisms	Opportunity for Clean Energy (e.g., generation, energy efficiency)
Clean Water State Revolving Fund	High-efficiency pumps, anaerobic digestion in waste-water treatment plants, downhill water capture
Drinking Water State Revolving Fund	High-efficiency pumps, wind/solar-pump storage hybrid systems, co-generation
Water Infrastructure Finance and Innovation Act	Anaerobic digestion, storage at peak-energy times
Transportation Finance Infrastructure and Innovation Act	Public transit (energy efficiency), congestion-relief (fuel efficiency)
Highway Trust Fund	Electric-vehicle charging infrastructure, mass transit
Fixing America’s Surface Transportation Act	Public transit (energy efficiency), congestion-relief (fuel efficiency)
Grant Anticipation Revenue Vehicle (GRAVEE) Bonds	Congestion relief
Waste and Water Disposal Loans and Grants	Anaerobic digestion, landfill gas
Transportation Investment Generating Economic Recovery (TIGER)	Compressed or Liquefied natural gas vehicles, electric vehicles, alternative charging stations, public transit, bicycle lanes, urban mobility
Hydropower / Dam Rehabilitation	Hydroelectric power, wind/solar pumped storage

There is an opportunity to prioritize groundbreaking technology in the next generation of infrastructure. One such future proofing example would be to prioritize funds for electric vehicle recharging stations at rest stops. EVs will represent an increasing share of cars on the road over the life of these investments.

Similarly, transmission and distribution line investments should be optimized for distributed energy resources (DER) that can be incorporated into a decentralized grid. These investments should [also support enhanced demand-side response](#) (DSR) capabilities.

Clean Energy for Rural Development

Clean energy creates an opportunity for reinvestment in rural infrastructure. Across America, more efficient generating equipment can be brought to existing facilities and it is possible to add generating capacity to infrastructure—specifically dams used only for water control—that has none today. For example, many of our existing dams are in rural America and currently only [three percent](#) of our nation’s 80,000 dams currently generate electricity. With emerging technologies infrastructure—including transport and irrigation canals, and drinking water and clean water systems—can be retrofit for hydropower.

Pursue Next Generation Technologies as a Matter of National Security

Infrastructure spending should embrace technologies that will promote greater resiliency and security. Investments should be made with a long time-horizon to enable America to compete internationally with China.

Maximize Public-Private Partnerships

New strategies will be necessary to attract private-sector investment by increasing risk mitigation, prioritizing revenue generation, and narrowing the focus of viable investments.

Emphasize Generating Revenue

The expansion of American infrastructure in the mid-20th century was primarily publicly funded across most regions and sectors. Two phenomena occurred as a result:

- 1.) The operation and maintenance of infrastructure assets were left by the wayside, resulting in the deterioration of aging infrastructure today.
- 2.) Many of these assets, primarily and most visibly roadways, were built without consideration of generating revenue, leaving the funding of previously highlighted asset management once again up to the public.

The shift to attracting private capital, therefore, must be one where any project must have a revenue-generating component regardless of the positive externalities the project may have. Significantly, advances in technology such as sensors, identification standards and automated billing have precipitated an environment where assets that were previously difficult to collect usage payment for are now efficient cash collectors.

Increase Capitalization of High-Performing Revolving Funds and Emphasize Leveraging

By increasing the capitalization of successful revolving funds and focusing on leveraging, there is a greater incentive for states to prioritize projects that efficiently meet the needs of citizens, are on budget, on time, and have a high rate of return. Leveraging brings private capital into the public funding stream through the program’s issuance of bonds (typically at the state level). As a result, this creates opportunities for private capital to optimally apply financing to target geographies and types of projects that have a proven track record for good investment.

Grants for Financially Sustainable Projects

Federal grants should be tailored towards projects that otherwise would not be able to attract state or private sector funding but will be financially sustainable in the long-run. While most

utility-scale energy projects are privately developed, in many cases there is a public need that must be met. Therefore, federal grant programs should allow states and municipalities to sponsor a private entity for access to federal funds. Many clean energy projects have high up-front capital costs, but feature a short payback period to recoup initial capital outlays. Additionally, these projects traditionally have relatively lower operation and maintenance costs that can be fully recovered by revenue streams and affordable utility rates. By prioritizing these types of projects, new technologies can be deployed with high revenue generating potential and help modernize energy production, transmission, distribution, and storage.

Streamline Permitting and Promote Early Environmental Review

As part of The American Recovery and Reinvestment Act of 2009 (ARRA), the federal government prioritized the funding “shovel-ready” projects. However, the identification of these shovel-ready projects proved to be a monumental challenge. As a result, funds were applied to projects that often took several years to break ground. Part of the reason was that “shovel-ready” was defined too broadly, ultimately qualifying all projects that received approval from the state within 120 days. Recognizing the significant effort and assurances required to progress to accelerate the delivery of funds, CRES Forum recommends the following:

Expedited Federal Permit Reviews

Compile the permitting scenarios between federal agencies with oversight over clean energy projects to consolidate and simplify the permitting process, create accountability, and institute clear procedures. An example of a step in the right direction is the Bureau of Land Management’s [“Smart from the Start Rule,”](#) adopted in November 2016, which provides transparency and predictability to permitting and fee structures for the development of industrial scale wind and solar energy projects on public lands.

Encourage Early Environmental Impact Statement (EIS)

In addition to expediting permits, the federal government can encourage early EISs focusing on stakeholder engagement and the development of feasible alternatives. Currently, the EIS process takes [three and a half years to complete](#) and can cost millions of dollars for some energy projects. Providing prioritized permit review for projects that have undertaken EISs earlier in the development process would alleviate a large financing risk earlier in the project lifecycle, accelerating the pace to construction.

Engaging the Development and Financing Communities

The federal government should be proactive in identifying projects ripe for financing, and be responsive to the investment and development communities in identifying finance constraints on existing development assets. The Trump Administration has already taken an early step towards this goal by issuing a [list of 50 priority infrastructure projects](#) and an overview of their statuses.

Consolidate Funding Mechanisms and Empower States

Federal funding has the potential to leverage private, state, and local funding more effectively through consolidation and alleviation of federal funding streams. State and local governments

can enhance their infrastructure spending if the federal government can simplify the process in which funds are applied, allocate funds based on performance standards, scale back federal government requirements, give state and local entities more authority on spending, and transparently indicate the qualifications for the replenishment of revolving funds.

Fund Consolidation

Federal funds are currently allocated by multiple entities through the Department of Transportation, Department of Agriculture, Environmental Protection Agency and others. Each have their own criteria and goals ranging from funding traditional federal projects to issuing grants for new innovations. Furthermore, some funds issue intergovernmental grants to state and local authorities, whereas other programs directly finance capital infrastructure projects.

It can also be difficult to determine whether a specific project falls under local or state jurisdiction and if it would qualify for federal funds. The Drinking Water State Revolving Fund (DWSRF) administered through the Environmental Protection Agency (EPA) has been largely successful in turning \$19.1 billion of public funds into \$32.5 billion in total capital in 2016 alone. A large reason for this success is due to the clearly delineated functions of state and local entities in relation to DWSRF.

State Autonomy and Accountability

State authorities are closely monitored on the application of federally provided grants and bonds. The bureaucratic burden that accompanies federal funds should be minimized by streamlining or eliminating restrictions in favor of performance indicators, state matching of federal funds, and clearly delineating the state-federal authority.

Performance incentives, such as timeliness of deliverables, adherence to budget, overlap of federal nexus, and fund growth should all be considered to qualify for future funds. Blocks should be allocated to states initially through a qualification formula. In the years that follow, project/fund performance can be a determining factor for federal assistance rather than taking a more rigid, regulatory approach to funding. This will allow:

- States to have much greater discretion in where funds may be applied, following less-strict guidelines from the federal government.
- States to compete for federal funds. This will eliminate wasteful spending and naturally encourage states to prioritize projects with strong economic potential and public benefit.
- States to innovate with new programs and activities by loosening the restrictions on the funds being applied.