



A Green Bank Is the Right Tool for Jobs

Recommendations for Setting Up a Clean Energy Finance Entity

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Protecting our national security, growing our economy, and avoiding the most catastrophic effects of global climate change require massively restructuring our energy system. Over the next 10 years the United States needs to move from a fossil-fuel-based economy to one powered by clean, domestic energy. Navigating this transition will require hundreds of billions of dollars in new capital investment from both public and private sources. We also need to reverse the current jobs crisis in a time of tight federal budgets and financial austerity. The solution is a Green Bank, which is the right tool to unlock private capital investment to renew America's energy infrastructure and create jobs.

A transformed clean energy economy will rely on both deploying existing and proven technologies and the development of new highly innovative, high-growth technologies and business practices that today are still being developed in laboratories and business incubators. The U.S. government has an important function in developing better tools for financing and commercializing new energy solutions and bringing them to commercial scale. Through a tool such as the Green Bank the government also will support private investor leadership in unlocking this dynamic engine of jobs, growth, and competitiveness.

The United States will not remain a global leader in technology innovation in the clean energy sector without a sustained effort to move advanced energy from basic research, to early phase R&D, through to commercialization, manufacturing at scale, and the deployment of these technologies in functioning energy markets. Meeting this challenge has tremendous implications for America's economic recovery and the global competitiveness of U.S. industries.

Yet very real structural barriers exist to financing this technology innovation process and sustaining the new jobs and industries it already supports. These financial market barriers are over and above the cyclical investment challenges that already hurt new investment as a result of the global economic downturn.

Many of our economic competitors already established clean energy finance entities to overcome these barriers. Sustainable Development Technology Canada provides

a useful model, as well as green banks in the United Kingdom, Germany, and China. Launching a Green Bank financing facility here in the United States to attract new private capital to key domestic investments on our shores offers a proven, market-driven, and truly bipartisan approach to reigniting capital markets in support of American business innovation.

This memo outlines a specific proposal to improve private capital markets for clean energy investment in the United States through the development of a dedicated independent Green Bank, which can be pursued either as a standalone facility or within the context of a broader program of infrastructure finance.

We also offer reflections on key criteria for ensuring that such a project will succeed. The structural concerns we highlight apply equally to an independent Green Bank and to the treatment of clean energy under an infrastructure bank.

Summary of Green Bank recommendations

In the current jobs crisis, policymakers in Congress and the administration should work together to elevate financial solutions to clean energy commercialization and enact an enhanced Green Bank, which will finance the clean energy solutions that are proven job creators. Especially in this moment of heightened concern over deficits and federal spending, a strategy that leverages large amounts of private capital investment to build a more productive and competitive economy must be a priority.

The Clean Energy Deployment Administration proposal recently passed with strong bipartisan support by the Senate Energy and Natural Resources Committee contains the key elements that any Green Bank should include, and provides the right foundation for moving a Green Bank forward. In addition we offer some more thoughts on specific criteria for enhancing this vehicle to improve its effectiveness.

Improving the federal government's capacity to support private capital investment in clean energy will require the establishment of a strong, resourced, and dedicated facility focused on the unique structural challenges clean energy faces in financial markets.

Any such Green Bank should meet the following criteria:

- Any U.S. Green Bank needs to apply a portfolio approach and have access to a range of financial instruments covering debt, equity, and insurance investments.
- This entity should have independence from the Department of Energy to minimize administrative barriers to effective program operation, but DOE should provide substantial guidance to align financing choices with broader energy strategy.
- This entity should be governed by an independent board with significant financial experience, similar to a private bank's structure.

- The Green Bank's portfolio of investments should be scored by the Office of Management and Budget on a product basis or using a pre-determined model, rather than deal by deal—thereby ensuring appropriate oversight while streamlining financial management.
- The Green Bank should prioritize commercializing clean energy and innovative business practices—not financing mature technologies or traditional energy resources.
- The focus on innovation-phase investments must also recognize both innovative technologies and innovative technology applications that also face market barriers even where the specific technologies are proven.
- The bank should be capitalized over five years on the scale of \$10 billion to \$20 billion, and the administration should actively work with congressional champions to assure an appropriate way to pay for it.
- Policies that increase market demand for clean energy and build complementary infrastructure should accompany this entity's establishment.

Government financing is essential for clean energy to expand

Energy is a matter of strategic national interest, and energy access is both a public good and natural monopoly—that is, it's most efficiently provided by a single firm with monopoly power. Because of these unique characteristics the government has regulated and directly invested in energy markets from day one. From subsidizing canals and waterways that powered early industrial expansion, to encouraging railroad construction to carry coal and providing tax benefits to oil producers, to the massive public investments in rural electrification that brought a modern economy to every corner of America, the government is an active participant in shaping the growth of reliable and affordable energy markets. Historically, these two attributes—reliability and affordability—have been the priorities for our energy system.

This strategic decision was key to America's growth and competitiveness in the 19th and 20th centuries. Today is no different, yet we now must add a third objective to our strategic energy priorities and use the full resources of the federal government to pursue universal access to affordable, reliable, and clean energy supplies.

Today, clean energy faces a number of exceptional hurdles in the market that conventional energy supplies don't experience, from capital market shortcomings in financing innovative industries, to market rules that favor incumbent technologies, to misaligned price signals from the external cost of global warming pollution, to a lack of data transparency in real estate and energy markets that encourages wasteful consumption and underinvestment.

At every step in the process of research, development, commercialization, manufacturing, and deployment, clean energy faces additional costs while competing against

historically subsidized incumbent industries. This situation is not in the public interest, and it hurts American competitiveness in emerging global markets.

These structural barriers can be best overcome through a capital market solution that reduces the cost of capital and improves access to financing for the commercialization phase of innovative technology. A Green Bank would provide just such a sustained institutional mechanism for overcoming these entrenched barriers to the growth of this vital infrastructure.

In addition, it is essential to target not only innovative technologies themselves but also innovative technology applications—such as energy efficiency—that deploy long-proven technologies through market innovations and thus similarly face structural economic barriers.

The government already engages in energy markets in a number of beneficial and targeted areas. In addition to well-known programs such as tax credits for renewable electricity, the government also manages ARPA-E (to provide support to companies that are developing new technologies), the Rural Utilities Service (to finance infrastructure investments in rural electric utilities), and the Export-Import Bank (which finances exports of clean energy technologies), to name a few.

These investments are all well targeted and do not crowd out private capital investment. They overcome market barriers to attract private investors into nationally strategic markets. These pro-market institutions and programs have a proven record of supporting the growth of private industry and long-standing acceptance by investors and businesses alike.

Currently missing, though, is a program that helps finance technologies in the “commercialization” phase of the product life cycle. That is, technologies that have moved beyond the research and development phase but have not yet reached broad-scale deployment in commercial markets.

Due to the perception of higher technology risk or innovative and unproven business models, these technologies are faced with what’s known as the “valley of death” where sufficient capital investment is simply not available as firms transition from venture capital financing of R&D efforts to commercialization at scale backed by low-cost capital from institutional investors and bond markets.

Equity investors, such as venture capital funds, don’t have enough money to meet the technology companies’ investment needs (which are often over \$100 million), and debt investors are not willing to bear the technology and business risks inherent in these new projects. Too often, otherwise viable companies with promising technologies and improved business practices die at this stage because they are unable to successfully cross the valley of death.

The government can go a long way toward remedying this situation by creating a financing entity that enables capital to flow more readily to these projects during this transitional phase. The government is uniquely able to bear these risks, and it can access the large amounts of capital needed.

Government is the only investor that will commercialize the technologies that will power our future economy. But the U.S. economy as a whole will benefit as new intellectual property is created and profitable businesses rebuild the economy and hire workers.

And we will only be able to capture the entire value chain for clean energy and the jobs that come with it if we commercialize technologies domestically. An added benefit of commercializing technologies here in the United States is that manufacturing tends to follow commercialization, leading to deployment. There are logistical reasons to locate manufacturing near markets (especially for large equipment like wind turbines), and companies also find that increasing knowledge flows between R&D, manufacturing, and market deployment increases profitability.

A Green Bank can build on existing programs and proposals

Government's role in financing energy and infrastructure is especially prominent now as the president and congressional leaders are calling for an "[infrastructure bank](#)" and as the [Section 1705 loan guarantee](#) program is drawing to a close.

The Section 1705 program was created as part of the [stimulus bill](#), and it is an extension of the existing DOE Loan Guarantee Program, which provides financing support for clean energy. Section 1705 is unique because it received a credit subsidy appropriation that allows it to offer loan guarantees without the borrower having to pay a credit subsidy fee. This appropriation will expire on September 30, and applicants to the Section 1705 program will be without financing support.

Some of these projects will be able to get private financing as debt markets bounce back, and a few others may be able to use the existing Loan Guarantee Program. Riskier applicants that are in the commercialization phase, though, will still not be able to find necessary financing. These applicants need a new financing tool.

Government policy remains essential to support the ongoing need for these innovative technologies and applications even as capital markets overall recover from the recent cyclical downturn.

At the same time, there are new calls for an [infrastructure bank](#), which could finance energy projects. Energy is a unique type of infrastructure since the electric bill creates a simple way to recoup the costs of infrastructure improvements. And energy infra-

structure costs—especially for renewable energy generation—are expected to decline significantly over time, so investment today leads to lower costs tomorrow.

These two unique attributes—declining costs and dedicated revenue streams—set energy apart, and argue for a dedicated financing stream for energy so that energy does not compete with infrastructure projects that have very different characteristics. This mechanism could be created as an independent standalone Green Bank or it could be housed within a larger Infrastructure Bank, provided that the clean energy finance functions were appropriately structured as an independent program with unique constraints, opportunities, and considerations.

Finally, energy finance has bipartisan appeal. The Senate Energy and Natural Resources Committee just passed the Clean Energy Financing Act of 2011, which would create a Clean Energy Deployment Administration. This bill received bipartisan support and broad backing from wide range of industry and financial stakeholders, while policymakers from both sides of the aisle also continue to support the loan guarantee programs.

A suite of tools are necessary

Different energy technologies and different companies have different types of risk and different return profiles. So an energy financing entity, such as a Green Bank, will need a suite of tools at its disposal, including debt, equity, and insurance tools.

Debt

Debt investors require a stable, fixed rate of return. Some clean energy projects will generate returns like this, particularly if they have some type of an off-take agreement—for example, an agreement from a utility to buy all of the power from a renewable electricity generation facility—for their energy. The government should provide debt instruments for these projects such as direct loans or loan guarantees.

The DOE Loan Guarantee Program is a useful example of the type of tool that's required in this space. The Rural Utilities Service and Export-Import Bank both also provide debt financing.

There are important reasons for a Green Bank to offer both direct loans and loan guarantees. Direct loans require more up-front capital (to actually lend the cash, whereas a third-party lends the cash with a guarantee), which is a disincentive to their use. Direct loans also reduce the ability to rely on outside investors to analyze investments, which is a key part of the DOE Loan Guarantee Program through the Financial Institution Partnership Program, in which DOE only guarantees 80 percent of the debt and out-

sources much of the analysis to an outside bank. The Small Business Administration also uses this model.

Some government agencies, however, find that direct loans are preferable because they eliminate a profit-oriented middleman and allow for more control over the program. The Department of Education's student loan program recently moved from guarantees to direct loans, for example.

Equity

Some clean energy technologies have returns that are less certain but potentially much higher. In these cases, investors are able to bear more risk in the hopes of earning higher returns. Clean energy companies that operate outside of a regulated rate environment, such as manufacturing facilities or advanced biofuels companies, are more likely to require equity investments, which provide a less certain but potentially richer return to the investor.

There are two significant challenges for the government in making equity investments. First, there's a high degree of risk in any equity investment, so the government will need to diversify across multiple technologies and projects. Second, there are very real concerns that government should not play a management role in companies and that government could potentially skew the playing field toward certain companies if the government benefits from certain companies' profits.

There are several ways to protect against these concerns while capturing equity-like returns:

- Government equity investments can flow not to individual companies but toward funds that will allow the government to see equity-like returns but maintain an arm's-length distance from individual companies. The Overseas Private Investment Corporation, the U.S. development bank, currently invests money in private equity funds along this model, as does the Small Business Investment Company program. The Clinton administration also adopted this same equity investment approach in its New Market Venture Capital program (that the Bush administration terminated). Legislation in the House in 2010 (HR 5297) created a Small Business Early-Stage Investment Program that would function in the same way.
- The government can take warrants in a company as part of a debt issuance. A warrant allows the investor to buy stock in a company at a predetermined price. Some deals in the Section 1705 program were structured with warrants as a risk mitigation technique: As the borrower hits certain milestones—and becomes less risky—the warrants are converted to straight debt. That way, the government's return is always linked to the riskiness of the investment.

Insurance and warranty

Beyond the typical debt and equity investments, a clean energy financing entity could also drive investment by offering insurance products, such as performance guarantees for new technologies. A performance guarantee would protect against product failure over the life of an investment, which is a real risk when using relatively new technologies with expected lifetimes of up to 30 years. Generally, these insurance products would likely be low cost and could be targeted at specific risks that investors in certain technologies are unwilling to bear.

The financing entity could also offer insurance wraps, which make bonds sold through capital markets more attractive to investors by guaranteeing a certain return on the investment.

Attract private capital investment at small public cost

The huge benefit of federal credit is that it “crowds in” private investment by using a small amount of government money to bring large amounts of new private money to the table. The cost to the government is not the total size of a loan or guarantee but rather the present value of the expected inflows (fees and interest payments) minus the expected outflows (either the initial cash disbursement for a loan or a payout to a private lender if a guarantee defaults). Some credit programs, such as the Export-Import Bank, even have a negative cost, meaning that they charge sufficient interest and fees to make money for the government.

Many credit programs operate at an extremely small cost to the government. The Rural Utilities Service electric programs, for example, typically cost the government about 1 percent of total outlays. That is, if RUS lends out \$1 billion, this only costs the government about \$10 million.

Commercialization tends to deal with riskier technologies, which are less likely to fully pay back any loan or provide sufficient returns on capital. Even in these cases, though, the government money leverages significant private capital. The DOE Loan Guarantee Program, for example, leverages \$13 in private money for every dollar in government spending.

These costs are small in relation to the investment leveraged. This is an important fact as government looks for ways to reduce the cost of federal programs through private leverage while still providing vital public services. Like other federal credit programs, these efforts access private investment that helps jumpstart new markets for credit products that the private sector is unable to pioneer on its own. This is an entirely appropriate role for the government where market failures are demonstrated because only the government can spread risk on such a large scale.

Forthcoming research from the Center for American Progress demonstrates that over the entire portfolio of government credit and guarantee programs, the government is surprisingly good at managing risk despite common perceptions to the contrary. Some lending and guarantee programs cost more and others cost less or even return a small profit to the Treasury. Many programs perform closely to initial predictions, while others are less predictable. But overall, given the size and diversity of the credit obligations of the federal government, it has incurred a small cost relative to the capital financing leveraged.

The government can use \$10 billion to \$20 billion to leverage more than \$100 billion

Learning from the experience of the Loan Guarantee Program, we recommend that a Green Bank should be capitalized over a period of five years to a level of \$10 billion to \$20 billion. This money can be used to cover the costs of \$100 billion to \$200 billion in commitments, meaning that every \$1 in public spending will drive \$10 in private capital investment. Public policy that leverages private capital investment is fiscally responsible, increases public benefit, and helps grow domestic jobs in American industries.

While it will be very inexpensive for the government, the Green Bank will likely not be a self-sustaining entity. Federal credit programs that operate at zero cost to the government are essentially just offering the right to borrow money at Treasury rates, while requiring that borrowers compensate the government for any risk involved in the loan. The Green Bank will bear a higher risk than these zero-cost programs, because companies that are commercializing technologies for the first time are unable to cover the costs of the risk. This means that the bank will expect to lose a small amount of money on each investment.

Based on experience with other energy credit programs, we estimate that it will take the Green Bank about five years to fully use the initial \$10 billion to \$20 billion in capitalization to make investments. At that point, policymakers may want to provide more funding.

Effective financing requires a portfolio or product approach to budgeting

The government will make some investments that perform worse than expected and others that perform better given the breadth of technologies and investment types a clean energy financing entity would support. The exact performance of any one investment in any one technology is unknowable in advance and is also unimportant. It is common practice in capital markets to manage such risk through diversifying investments across a portfolio. The same practice applies in establishing a Green Bank or other public finance mechanism.

Each investment should be analyzed independently, but the rules governing a financing entity should not be so stringent that they preclude investments in risky technologies.

Instead, these investments should be appropriately managed using proven portfolio strategies for risk mitigation so that the overall risk and returns are in alignment.

Though not a perfect corollary to a Green Bank, recent experiences with the DOE Loan Guarantee Program show that the speed and velocity of lending suffered from complex OMB oversight at the transaction level. Because oversight is involved in every deal, guarantees move slowly through the DOE program.

OMB has strong and important authorities and must always have the right to exercise its oversight functions. But many other federal credit programs manage these risks differently and do not require deal-by-deal calculation of credit subsidy rates, which have been proven to paralyze these transactions—in some cases fatally.

One way to provide high standards of quality in underwriting without micromanaging transactions is to develop credit subsidy rates for like transactions or loan and guarantee products rather than individual transactions. Or it is possible to jointly develop a pre-approved model for evaluating credit subsidy that allows agency officials to determine the rate using approved methodology.

In this way, a portfolio or product approach can lead to improved government efficiency, consistent with common government credit practices and sound financial practice.

Improve oversight authorities' organization

Much of the government's success in managing credit programs is due to the Federal Credit Reform Act of 1990. This bill prescribes how credit programs should be reflected in the budget, which accounting rules govern credit programs, and which government agencies play specific roles in managing credit. Because of the success of credit programs since FCRA's passage, good policy design dictates that a clean energy financing entity follow the structure FCRA lays out.

This means that OMB, Treasury, and Congress will all have an active role in managing this financing entity. This structure has clearly led to challenges with the DOE Loan Guarantee Program that will need to be addressed in a future Green Bank. Fortunately, other credit programs provide a model.

For instance, the Export-Import Bank does not send every transaction to OMB for scoring but instead uses a proprietary model they developed in coordination with OMB to score individual transactions. And while the annual appropriations process is burdensome, longstanding programs like the Rural Utilities Service prove that the process can be managed.

DOE historically is not known for its financing expertise, but under this administration, the recently established Loan Programs Office became one of the leading project finance teams in the world. This team should be maintained whether or not a clean energy financing entity is housed within DOE.

Finally, if the financing entity is not housed within DOE it will still be critical to have DOE leadership as the policy leaders on a team managing the entity. Commercialization follows on the footsteps of R&D. DOE is the leading government agency in energy R&D, and it's appropriate for commercialization to be closely linked organizationally. DOE needs to play a prominent role in making sure that the technologies that are critical to our nation's future are able to move from R&D to commercialization.

An independent entity should have appropriate flexibility

DOE policy and strategic guidance is clearly necessary for a Green Bank, but there are several reasons why a clean energy financing entity should be independent of any single agency. Primarily, independence increases the flexibility and nimbleness of a financing entity, allowing it to quickly respond to changing market conditions.

A nonagency board of governors would manage an independent entity. This could increase transparency and accountability. This board should be appointed by the president with confirmation by the Senate, creating a strong oversight system independent of political influence or bureaucratic interference. A board containing financial professionals—and not just government officials or agency professionals—would also help build trust among the general public that the entity would be well-managed.

In Canada, a Green Bank governed by an independent oversight board was implemented with demonstrated success. This bank, Sustainable Development Technology Canada, offers a wide range of financial products in support of clean energy development.

Another advantage of an independent entity is that it has greater freedom to operate outside of the civil service pay scale. This is especially important for a financing entity in which the pay scales for private-sector employment and the civil service are so different.

The DOE Loan Programs Office is an excellent example of the challenges with building a competent team of project finance professionals within the civil service when they can make higher salaries and earn bonuses and stock options in the private sector. That team took four years to build, and it could be more readily maintained on an ongoing basis if the entity had the freedom to operate outside of standard civil service structures.

Finally, DOE's role in an independent entity would need to be carefully structured. DOE staff would provide recommendations for a suite of technologies each year—say,

a recommended portfolio of battery storage, solar power, and advanced automobiles, among others—with the independent entity given the freedom to pick individual investments within the overarching DOE framework. This would involve DOE policy guidance while streamlining transactions.

Financing is not enough to move the clean energy industry

It's also important to keep in mind that a lack of financing is not the only thing holding back clean energy. In particular, we need to make sure that financing is accompanied by improved market certainty, strong demand, and by a broader program of investment in appropriate infrastructure.

A Green Bank, therefore, should be accompanied by policies that drive market demand such as an 80 percent clean energy standard that sets clear renewable energy and energy efficiency goals. It's also critical to support technology investment with appropriate public-sector engagement to build complementary infrastructure such as electricity transmission and distribution grid investments targeted at renewable energy supplies.

Financial solutions should be pursued actively, immediately, and independently, but in parallel with these complementary policies.

Conclusion

In summary, DOE and the White House should work with champions in Congress to immediately enact an enhanced Green Bank on a bipartisan basis. The Clean Energy Deployment Administration proposal already developed by the Senate Energy and Natural Resources Committee can provide a solid foundation for such a bank.

Alternately, this strategy could be successfully implemented within a larger national infrastructure bank. In that case the design criteria laid out here and within CEDA will still provide a useful framework for structuring a strong, effective, and independent clean energy finance program within a larger infrastructure bank.

Under either scenario, this new Green Bank should be empowered as an independent entity, with a strong independent oversight board, direct DOE engagement, and appropriate OMB oversight over portfolio investments. This entity should be authorized to employ a broad range of policy tools and financial instruments including debt, equity, and insurance investments.

By targeting both the commercialization of innovative clean energy technologies and innovative technology applications—that while technically proven face real market

barriers—this authority would attract new capital investment into financial markets and refrain from crowding out private investors from more mature and mainstream technology investments.

The Green Bank should be capitalized over five years at \$10 billion to 20 billion, and the administration should actively work with congressional supporters and financial and industry stakeholders to assure an appropriate “pay-for” mechanism early in the process and build bipartisan support to ensure against politicization of this vitally needed economic reform.

A Green Bank will provide a cost-effective approach to leveraging private capital investments to create jobs and support the growth of U.S. businesses. Quite simply, it’s the right tool for American jobs.

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