

Federal Funding for Renewable Energy Projects

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ABSTRACT

Under growing pressure to address the need for secure and sustainable energy, the Federal energy policy, program, and funding landscape has changed dramatically. Major energy legislation and Presidential initiatives have created a large portfolio of programs to advance renewable energy, and funding has increased substantially. Billions of dollars in grants, loans, loan guarantees, and tax incentives are flowing to universities, state and local governments, and the private sector. These Federal government investments are designed to accelerate the development, demonstration, and commercialization of renewable energy technologies. Developing a strategy to identify and access these opportunities is key to competing for this funding.

Keywords: renewable energy, Federal funding, energy R&D, energy policy

1 ENERGY CHALLENGE

Environmental, economic, and social forces are driving an urgent quest for clean energy solutions. Global energy demand is soaring, projected to increase by 45% by 2030. Emerging economies are expected to account for most of this increase. While demand is soaring, energy supplies are fragile. The Middle East oil supply is increasingly unstable, and Russia, Iran, and Qatar account for more than half of natural gas reserves. U.S. dependency on foreign oil has grown to 60%, while Americans have seen significant volatility in energy prices.

At the same time, a rapidly growing developing world has raised fears about increased pollution, there is growing concern about global climate change and pressure on the United States to do something about it. The International Energy Agency's recent projections suggest a 45% increase in greenhouse gas emissions by 2030, with emerging economies accounting for almost all it.

As a result of these energy and environmental trends, consumers and governments are more worried than ever before about clean air, clean water, global warming, soaring fuel prices, and energy security.

2 POLICY LANDSCAPE

Under growing pressure to address the need for secure and sustainable energy, the Federal government's energy policy, program, and funding landscape has changed dramatically. Driven by comprehensive energy legislation and Presidential initiatives over the past eight years, the Federal government has established a multi-program portfolio for advancing renewable energy, and funding has grown substantially.

2.1 Energy Legislation and Initiatives

President Bush's 2003 Hydrogen Initiative committed \$1.2 billion over five years; a \$309 million investment for Fiscal Year (FY) 2008 completed this commitment, although the Department of Energy (DOE) continues to invest in advancing hydrogen energy science and technologies. This Presidential Initiative has focused on hydrogen-powered fuel cells for transportation and electricity generation.

The Energy Policy Act of 2005 was the first comprehensive energy policy in a decade. It authorized: \$4 billion for hydrogen and fuel cell R&D and demonstrations; large investments in biorefineries; and new efforts in solar, wind, and biomass. The legislation authorized DOE to issue loan guarantees to projects that employ innovative technologies that avoid, sequester, or reduce greenhouse gas emissions, and it established tax incentives to encourage production of electricity from renewable sources of energy.

President Bush's Advanced Energy Initiative focused on power for transportation, homes, and businesses. Funding for this initiative grew to \$2.5 billion in FY 2008, with a large emphasis on advancing batteries for plug-in hybrid vehicles, PV solar, and cellulosic ethanol.

The Energy Independence and Security Act of 2007 authorized even more funds for renewable energy R&D and demonstrations in vehicle technologies, biofuels, solar energy thermal storage, PV solar, geothermal energy,

marine and hydrokinetic energy, clean coal, renewable energy manufacturing, and smart grids.

The Farm Bill passed in 2008 included numerous provisions to support the development of renewable energy from farm-based resources. These include loan guarantees and grants to spur establishment of biorefineries and biofuel production plants, funds for energy efficiency and renewable energy projects for agricultural producers and rural small businesses, biofuels production subsidies, and funding for biomass R&D.

Several tax credits provide incentives for renewable energy production. The Renewable Electricity Production Tax Credit is a per kilowatt hour credit for electricity generated from renewable sources of energy, the Business Energy Investment Tax Credit provides a credit of up to 30% of company expenditures on solar energy property placed in service, and there are several credits available to producers of bio-fuels.

At this writing, the 2009 stimulus package—the American Recovery and Reinvestment Act of 2009—would appropriate billions of dollars in new funds to accelerate the development and deployment of renewable energy. These include: \$2.5 billion in additional funds for energy efficiency and renewable energy R&D, demonstration, and deployment; billions to state and local governments for energy projects; \$2 billion in grants to establish advanced battery manufacturing in the United States; \$6 billion in new loan guarantees to spur renewable and electricity transmission projects; \$11 billion for smart grid activities; and millions for U.S. military renewable and energy efficiency projects. This legislation also expands the renewable resources eligible for the Business Energy Investment Tax Credit.

During his campaign, President Obama outlined an aggressive energy and environmental agenda, including a cap and trade system, a 10-year \$150 billion investment in clean energy technologies, efforts to make nuclear energy production safer and more secure, a renewable portfolio standard for electricity production, government purchases of renewable energy, smart grid, building energy efficiency, and increased fuel economy standards.

Several laws and Presidential Executive Orders direct Federal departments and agencies to increase their energy efficiency and use of renewable energy. For example, the Federal government is directed to achieve an energy reduction of 30% by 2015, and the Department of Defense is mandated to produce or procure renewable energy equivalent of 25% of facility electricity consumption by 2025.

2.2 Program Funds, Flows, and Forms

From these laws and Presidential initiatives, billions of dollars in investments flow annually for which universities, state and local governments, non-profit organizations, consortia, and private companies can compete. Individual grants range from: a few hundred thousand dollars for academic research projects or for expanding a rural biofuels plant, to a few million dollars for a university research center or company project to develop a new energy storage system, to as much as \$80 million for building and demonstrating an integrated biorefinery.

Billions of dollars are available for loans and loan guarantees to support commercialization and manufacturing of renewable energy technologies, advanced vehicles, and components for these vehicles.

Some businesses can access funding for business plan development, feasibility studies, the purchase and installation of renewable energy-producing equipment, and marketing plan development.

There are Federal and military acquisition opportunities ranging from better boilers and batteries, and fuel efficient vehicles, to roof top solar systems and utility-scale renewable electricity generation.

There is also funding available to train workers for jobs in energy-related industries.

Competitive, merit-based grant funding opportunities are typically advertised publicly. They have fixed deadlines for receiving proposals, well-defined requirements, and awards are made after a peer review process. In some cases, organizations can partner with Federal agencies and Federal laboratories for projects using cooperative research and development agreements. Some research agencies are willing to consider unsolicited proposals.

In addition, to fund their renewable energy projects, many universities, non-profits, state and local governments, and companies receive directed Congressional appropriations—earmarks—despite Washington's perennial campaign to stop them.

2.3 Federal Energy Leaders

DOE's Office of Energy Efficiency and Renewable Energy (EERE) is the renewable energy R&D funding sweet spot. It is the primary source of support for renewable energy research and technology development—in biofuels, hydrogen, wind, solar, and marine energy—and for advancing fuel-efficient, cleaner vehicles. EERE is unlike many Federal agencies that fund R&D; it is not an academic R&D seller's market, but an R&D and solution

buyer's market. EERE works with universities and industry to identify renewable energy opportunities and challenges, it establishes specific program goals (technical, performance, and/or cost), it develops multi-year R&D program plans, and seeks projects with potential to contribute to meeting program goals. EERE has a large focus on spurring the commercialization of promising technologies that have been developed, and there is a significant role for industry partners in much of EERE's work. EERE awards large sums of funding; for example, per solicitation awards have ranged from \$10 million for a dozen basic research projects, to \$385 million for six biofuels demonstration plants. EERE's \$1.7 billion budget would swell with the \$14-\$18 billion the agency may receive in appropriations from the stimulus package.

The Department of Defense plays a limited but important role in renewable energy. Its role is mission-driven and, thus, specific requirements are often associated with DOD R&D funding. Successful R&D projects could translate into production and procurement opportunities. DOD solicits research proposals through Broad Agency Announcements and, in many cases, there is a low initial barrier to apply; short white papers are often sought before full proposals.

The Department of Agriculture oversees R&D, deployment, and subsidy programs related to energy from farm-related resources, such as biomass, animal waste, and wind.

The National Science Foundation funds some basic energy R&D and, generally, favors academic R&D.

3 ACCESSING FEDERAL FUNDING

Federal funding is not for every organization. Before undertaking an effort to access Federal funds, organizations should consider the costs and benefits of such an effort, should identify specific opportunities, and determine whether or not it can sustain a commitment and dedicate resources to an effort that may take 12 to 24 months. Organizations must also consider the degree to which their goals can be aligned with the government's goals, and their willingness and ability to comply with government regulations, timelines, and reporting requirements.

3.1 Federal Funding Strategy

If an organization determines that an effort to access Federal funding could pay-off and decides to go for it, a Federal funding strategy should be developed. Such a strategy should: look ahead at least a year, identify all possible funding opportunities, prioritize the opportunities aligned most closely with the organization's funding needs and technical interests, identify government program managers to educate about the organization's projects and

capabilities, and identify Members of Congress who could be helpful in supporting a proposal or earmark, or influencing the direction of Federal policies and programs.

Vigilance and routine monitoring are required, because the funding landscape is in a constant state of change—each year, new budgets are proposed, and Congressional authorizations and appropriations made; new legislation is routinely introduced; funding opportunity announcements are released frequently; agencies convene bidders conferences; and they announce who has won awards for what projects.

In addition, Federal agencies convene conferences and workshops to gather advice and technical knowledge they can use to shape R&D agenda, R&D roadmaps, and multi-year R&D plans. These roadmaps and R&D plans are made public, and are critical for understanding what types of funding opportunities may arise in the months and years ahead.

3.2 Winning Proposals

When funding opportunities arise, a proposal is generally required. In developing a proposal, an organization should examine a program's purpose and goals—as stated in authorizing legislation, agency budget documents, R&D plans, and/or the request for proposals—and determine if it can meet any matching fund requirements or fees associated with Federal loans and loan guarantees which can be substantial. In writing the proposal, emphasize how the project for which funding is being sought can help the Federal agency meet its goals.

An organization should give itself plenty of lead-time to prepare a high quality application. A proposal from a university researcher seeking a small grant for scientific research may take just a few weeks to develop. However, a proposal for a high-dollar grant, loan, or loan guarantee for establishing a renewable energy system, biorefinery, or manufacturing facility is very likely to require various permits, environmental studies, third-party evaluations, engineering plans, a detailed budget, and reams of company financial data—which can take substantial time to develop, acquire, and assemble.

A high quality proposal will include a narrative that covers: the project approach, specific activities that will take place, a discussion of technical merit (which may include both technical and market considerations), and benefits to be achieved. There may be requirements to set goals, list project milestones, and identify how project outcomes will be measured.

In assembling a proposal, it is important to follow any prescribed format, and to ensure that every requirement—be it a Federal form or environmental study—is adequately

addressed. Failure to meet any requirement could result in disqualification of a proposal.

requirements satisfied. Building a track record of success enhances the prospect of future funding.

3.3 Getting Help

A university researcher should have little problem developing a proposal for a small scientific research grant. Also, there are numerous professional grant writers whose assistance can be purchased.

However, particularly in technology development and demonstration programs, and as the grant dollar size gets larger, organizations may need to assemble an internal team to develop a proposal including technical, business, marketing, financial, and accounting personnel.

Developing proposals for high-dollar grants, and especially applications for high-dollar loans and loan guarantees, assistance from outside experts is likely to be required. These may include third parties to evaluate and endorse a project's merit, project financing experts, engineering companies, and environmental study experts.

If an organization seeks to put in place a longer term strategy for accessing multiple sources of Federal funds, and/or to influence the Federal renewable energy policy, program, and funding agenda, some firms such as my company—TechVision21—have experience in such efforts.

TechVision21 has worked with diverse clients of all sizes—small biofuels producers, universities, state science and technology agencies, innovative start-up companies, and Fortune 500 companies—and most have successfully accessed Federal funds, and/or exerted influence on legislation or Federal energy program directions.

For these clients, TechVision21 has: characterized the relevant policy and funding landscape; developed Federal funding strategies; identified specific funding opportunities; assisted in developing and writing high quality proposals and program applications; monitored legislative, policy, and program developments; and organized meetings with key legislators and Federal program managers who can advance client interests.

4 KEYS TO LONG TERM SUCCESS

For organizations that are seriously committed to accessing Federal funding, an aggressive multi-year strategy should be developed and executed. An organization should move on several fronts simultaneously, and seek support from different funding pools. It is also beneficial to build relationships with key agency and elected officials.

Finally, if awarded Federal funding, ensure that the project is executed well, milestones are met, and reporting