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Energy for the Future

COMMENTARY:
Renewable Energy Gets Closer Look; Green Industry Red Hot

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Roger Bridges, President of Hill's Canadian operations, became intensely interested in the earth's fragile environment and finding ways to sustain it thirty years ago, when he was working at a job that some might consider incongruous to environmental protection.

Interest in alternative sources of energy, such as solar and photovoltaic power, is on the rise.

"I used to work for an oil company," Bridges said. "Oil companies, at one time, were targeted by environmental groups and did not have very good global reputations. Generally, they were regarded as the bad boys."

However, Bridges added, oil companies had both the money and the motivation to change their image, and pumped millions into saving the very environments they were accused of harming. Oil companies began investigating alternative forms of energy because even they understood that carbon-based fuel was in limited supply. Eventually, the earth's stores of oil, coal and natural gas will dwindle, and other sources of fuel and alternative power could render carbon-based products nearly extinct. Those alternative sources could, in the end, prove very profitable. Also, a focus on alternative forms of energy provided the added benefit of helping the oil companies improve their images.

"Oil or energy companies will look at any form of energy generation, as long as there is a market for it," Bridges said.

Rising oil prices, an international shortage, and a beleaguered public fed up with seemingly endless lines at the pumps also fueled much of the push for alternative energy in the 1970s.

"I was just starting my employment at an energy company that was looking into alternative forms of energy, forms other than hydrocarbon (the element that facilitates combustion). There were various disruptions in the Middle East that caused what we now call the Energy Crisis," Bridges recalled. "The price of crude oil went from $2.79 a barrel to $11 a barrel almost overnight."

A mixture of politics, Arab-Israeli tension and an ailing world economy made oil prices continue to rise through the mid-1970s. Rising prices and high levels of pollution also fueled a marked interest in such technologies as solar energy, thermal energy, and wind power. The business of environmental remediation got its start. Consumers ditched their gas-guzzling, four-door sedans for smaller, more compact cars that burned fuel more cleanly and efficiently. Much like what we recently saw as SUVs were traded in for fuel-efficient vehicles. Solar panels began popping up on homes and businesses. Sales of wood-burning stoves, kerosene heaters, ceiling fans and other alternatives for heating and cooling our homes saw dramatic surges.

"The height of oil prices in 1972 got people thinking about alternative energy. All kinds of weird and wonderful things were being proposed in those days. Some of them were wonderful," Bridges said with a laugh, "and some were just weird." But, for a young professional in a fledgling industry, those were heady times.

By 1980, prices had leveled off, and continued to drop throughout the decade. "We had an oversupply and then a drop in oil prices," Bridges said. "For a number of reasons, OPEC lost its balance of power and other counties, such as Canada, began exporting oil to the U.S., Western Europe and other parts of the world." (Today, Canada produces an estimated 2.1 million barrels per day, transported to the U.S. via land-based pipelines, Bridges said.)

Before long, consumers fatigued by a decade of scrimping were ditching their compact cars for larger, luxury vehicles, and turning in their solar panels and wood-burning stoves for vaulted ceilings and natural gas fireplaces.

Today, a very similar mixture of world politics, a world-wide economic downturn and skyrocketing oil prices has created a renewed interest in alternative forms of energy. Oil companies and other big businesses are again pumping money into research and development, and consumers are clamoring for everything green, and urging local, state and federal officials to help break what has been called an international addiction to fossil fuels.

"Fossil fuels have traditionally been the primary sources of power throughout the western world. Power plants have largely been oil-fired, gas-fired or coal-fired," Bridges said. Hydroelectric power—power generated by the force of falling or surging water is thought to be a cleaner energy producer, but has its drawbacks as well. "Hydroelectric is, in essence, very clean, but you have to dam a canyon or a lake, which can displace a lot of people."

Nuclear power, stymied in the 1980s following the much-publicized accident at Three Mile Island in central Pennsylvania, and the devastating Chernobyl disaster in the former Soviet Union, made people aware that nuclear power had a downside to it. "Now, thanks to technological advances and re-branding, nuclear power could be a serious means of generating power as we go forward," Bridges added.

Steven DiBartolo, a Hill vice president, agreed. "Nuclear power plant safety has come a long way in the past two decades," DiBartolo said. "It's a cleaner source of energy than oil, gas or coal, but still has not solved the problem of nuclear waste. Still, it is an alternative that has the potential for becoming a leading source of power in the United States and elsewhere."

"Nuclear technology has moved forward," Bridges concurred. "The first round of power plants was built in the 1950s and 1960s. Since then, everything—from technology, to the metals used to the welding techniques—has moved forward. And, our risk analyses and other studies are far more thorough, far more advanced than they were in the 1950s and 1960s."

Interest in alternative sources of energy, such as solar and photovoltaic power, is on the rise.

Even a glut of new nuclear plants would still leave ample room for other technologies, Bridges said. Tidal energy—drawing power from the rhythmic surge and withdrawal of tides—is one of them, and is well suited to very specific areas of the world. "Tidal energy works

best in an area that has a marked tidal rise and fall. Also, you need to be close to both the source of the energy and a major center of population that requires the electricity. The longer the (transmission) line, the greater the loss," he explained. Tidal energy is perfect for parts of eastern Canada. "We have one in the Bay of Fundy, which has the highest rise and fall of any tide in the world—70 feet. Quite simply, you put a turbine in the channel and the incoming pressure of the water will turn the turbine blade. When the water goes back out, the blade turns in the other direction," Bridges said. "It's a very environmentally stable source of energy as long as you take provisions to protect fish, other sea life and their habitats and migrations.

"Another location is in the United Kingdom, at the Severn Barrage, which is near Cardiff and Bristol, and has a rise and fall of 54 feet. There is also a river in France, in Bordeaux, that has similar characteristics," Bridges continued. "Such extreme rises and falls in tides provide golden opportunities to create power."

While the technology may be space-aged, tidal power, like many forms of alternative energy, stretches back centuries.

Wind power is enjoying an unprecedented peak in popularity. "We have several turbines here in Canada, in Alberta, and we're looking at putting up some more on the north shore of Lake Erie," he said.

Harnessing the wind to create power is an idea that is centuries old. "Windmills have been used in Holland for centuries, but for a different purpose."

"Tidal energy is not new to anyone. There are plenty of old-fashioned mills that run off streams or tides, where the use of tidal power was used to grind corn or something. All we do today is attach a turbine to it to generate electricity. Likewise, windmills have been used in Holland for centuries, but for a different purpose," Bridges said. "These ideas are not new; they are extremely old and being brought back. The difference is that, in the 'old' days, we didn't have generators to create electricity. Now we can get not only mechanical power, but electrical power as well."

Biomass is another, broad area that has been getting increased attention. "One application of biomass, for example, allows you to make good use of a landfill. You take the methane gas that is created (by decomposition) and use it for either power generation or mix it with traditional gas, for example, to power a gas turbine."

Biomass also can include some very esoteric ideas for creating energy. "People are even looking in to creating fuel from the (decomposition of) pig manure and chicken droppings," Bridges said. "While those ideas have merit, I don't expect them to become widely used."

However, wastewater treatment plants in North American and Europe are being fitted with technology allows the produced methane to power the plant itself. "Again, this technology may not apply to a broad use, but certainly helps make the treatment plant self-sustaining."

Geothermal energy—trapping and using the earth's natural underground heat, also isn't new. It's an idea that is as old as the prehistoric geysers at Yellowstone National Park in California. The United States leads the world in this emerging and highly efficient technology. "The efficiency you get with thermal energy overcomes any power you use to capture it," Bridges said.

An innovative project in Canada, along Lake Ontario, uses cool water pumped from the massive lake to cool many of Toronto's buildings. "Lake Ontario is one of the biggest fresh water masses in the world, and Toronto is a lakeside town. To put it simply, a pipe goes out into the lake about a mile, to where the water is about four degrees centigrade. The pipe is used to pump water out of the lake, and the water is then distributed via a massive piping system to Ontario's buildings. So, we're using cold water, and not as much electricity, to cool our buildings. It's been done here for a number of years."

Bridges, like others watching the industry, is intrigued by a new form of solar power that many feel will soon eclipse the traditional way in which energy is created by the sun. Most traditional solar technology uses the heat of the sun to produce hot water, which then is used for heating of other purposes.

Photovoltaic power converts the sun's power directly to electricity. It is reported to be the world's fastest-growing form of alternative energy. Spain and Germany have taken the lead in developing and installing the technology, but other industrialized nations aren't far behind. The United States recently unveiled its largest photovoltaic power plant, located on the Nellis Air Force Base outside of Las Vegas, Nevada. The plant, located on 140 acres leased from the U.S. Air Force, is capable of generating up to 25 million megawatts of power, enough to supply more than 25 percent of the base's power.

DiBartolo and Bridges are optimistic that they'll see more of such alternative technologies in the future, and that the push for cleaner energy and less reliance on fossil fuel won't wane if oil prices decline.

"Alternative and renewable energy is quickly becoming a culture. Trends come and go, but when something becomes part of a culture, of a national mindset, it's here forever," DiBartolo said. "If you think about it, kids today don't remember what it was like without the internet. It's the same with being green and sustainable. It's all they know."

Bridges feels that political forces are just as important to the health of this sprouting industry as public opinion. "I think the world has realized that something is going on with the climate. President Obama has made it clear that he supports cleaning up the environment and, in fact, sees the country's economic recovery as dependant, at least in part, on producing alternative energy," Bridges said. "And, the environmental lobbies are getting stronger and stronger. Politicians are realizing that, to get re-elected you have to think in terms of a greener society." MSN reported that David Sandalow, assistant energy secretary, referred to the oil being discharged from BP's damaged well as a ""tragic situation" that shows why renewable energy must be a priority in the decades to come." "It underscores the need for a transition to a clean energy economy," he said. The comments echoed those of his boss, President Barack Obama, who has used the Gulf oil spill to urge Congress to pass legislation aimed at reducing the United States' dependence on oil and other fossil fuels.

For Bridges, a self-described "child of the 60s," such changes could be a breath of fresh air. "Encouraging a greener society benefits everyone."

Nuclear Power: You've Come A Long Way, Baby!

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Even in the midst of the most severe economic downturn since The Great Depression, the Energy Information Administration (EIA) forecasts an increase in demand for electricity of 14% by 2035. Between 2029 and 2035 nearly a third of all existing nuclear capacity (30.8 gigawatts) will reach 60 years in operation (i.e., the end of their originally anticipated licensing and expected plant lifecycle).[1] How is the power industry going to meet the need for new power?

Why Nuclear?

A number of developments make nuclear an attractive and favored option for meeting this new energy demand. As crude oil continues to gush into the Gulf of Mexico, even the most vocal anti-nuclear advocates pause and blush. Whether fairly or unfairly, the burning of fossil fuel has been blamed for everything from acid rain to lung ailments to global warming. And the current trends in public policy disfavor additional fossil fuel capacity. As stated in the 2010 EIA forecast:

However, Federal tax incentives, State energy programs, and rising prices for fossil fuels increase the competitiveness of renewable and nuclear capacity. In contrast, uncertainty about future limits on GHG emissions and other possible environmental regulations reduces the competitiveness of coal.3 4 These are just the environmental concerns that have caused people to give nuclear a second look.

Years of increasing volatility in the cost of natural gas and other fossil fuels make coal and gas fueled electricity increasingly difficult to reliably price and forecast. And after three decades of safe nuclear operations in the United States, safety concerns surrounding nuclear are significantly less than years past. Indeed, current EIA projections actually assume the renewal of all existing nuclear plant licenses past the 60 year life expectancy of a nuclear plant. (Id.). In somewhat of an epic comeback, public optimism in nuclear power as a safe, cost-effective, and clean source of electricity is perhaps as high as it has ever been.

New Approach To Construction And New Technology

Enthusiasm within the industry also is growing because newer technologies are being offered to meet cost and scheduling issues that proved problematic when the last round of nuclear plants were ordered and built in the 1970's and 1980's. Anywhere from ⅓ to as much as ½ the cost of earlier nuclear power plant projects was direct cost of finance during construction. Indeed, the adage "time is money" perhaps never has been proven to be more true than by the nuclear energy industry a few decades ago. Projects were priced on a time and material (T&M) basis and were constructed "design-as-you-go". T&M contracts contain cost-reimbursable aspects that put the risk of scope creep, delay and increased costs in materials largely on the owner. Design-as-you-go invited delays when projects were already underway but the constructor was waiting on design information (sometimes driven by regulatory change) while attempting to sequence work and construct plant components on-site. The cruel and relentless effects of time and financing costs were exaggerated in an already pricey and lengthy nuclear construction process.

Recent improvements in how nuclear plants are constructed creates an opportunity for nuclear to demonstrate itself as a favorable alternative to past nuclear projects and existing non-nuclear power generation technologies. Several major contractors are offering design complete, Engineering Procurement Construction (EPC) contracting, using a modular construction method. EPC contracting puts a greater portion of project control (and risk) with the constructor. For the owner, this means a better understanding of actual project costs and that the EPC contractor will have a greater financial incentive for finishing the project on-time and on-budget. Modular construction is done off-site and plant components such as HVAC or electric services are then "snapped together" on-site. This allows for certain plant components to be built out of the way of other construction activities, in parallel with other construction activities (rather than sequentially),

1 We note also that the EPA recently issued a proposed rule change related to boiler emissions, which might undermine the viability of pending and future biomass projects. (Federal Register, Vol. 75, No. 107).

and under conditions that may be better suited for quality control than the construction site itself.

Energy Policy Act Of 2005 And New Permitting Process

Even the Federal Government, through the Energy Policy Act of 2005 and the Nuclear Regulatory Commission (NRC)'s new permitting procedures, is doing its part to make new nuclear power more feasible. The Act provides a number of incentives for nuclear research, as well as loan guarantees for new projects, tax incentives for new nuclear capacity and funding for cost-overrun and construction delay support. Specifically, the Act contains the following incentives for new nuclear power construction:

1. A number of provisions in the Act authorize in the aggregate nearly $3 billion in new research into issues such as new plant design for Generation IV reactors, new reprocessing technologies, promotion of promising technologies, the building of an advanced hydrogen cogeneration reactor at Idaho National Laboratory, and training for individuals in nuclear industry

2. Section 638 of the Act authorizes the Secretary of Energy to enter contracts for 'standby support' of up to $2 billion for construction delays for up to six new nuclear power plants. "Covered delays include the failure of the NRC to comply with schedules for review and approval of inspections or the conduct of hearings, in addition to litigation that delays full-power operation."

3. Section 1306 of the Act allows the Secretary of Treasury (in consultation with the Secretary of Energy) to authorize a tax credit of 1.8 cents per kilowatt-hour to advanced nuclear power facilities for the first eight years the plant is in service

4. Title 18 of the Act authorizes the Secretary of Energy to provide loan guarantees for clean air projects such as nuclear of up to 80% of project cost to be repaid within 30 years or 90% of the project's life

The new permitting process by the NRC may also make new nuclear more approachable for the owner. The objective of the new permitting procedures is to remove some of the uncertainty of past nuclear construction projects by front-loading the permitting process before the NRC. Permitting is done in three steps:

1. Design certification process
2. Early site permitting
3. Combined construction and operating licensing

The new permitting process combines licensing procedures that previously were treated separately and, importantly, and provides sufficient opportunity for public comment at the beginning of the permitting process, as opposed to after construction. Under this new process, all licensing and permitting is effectively complete before ground is broken6 whereas under the previous permitting structure licensing proceedings, only a construction license would issue pre-construction and operating license hearings (with the opportunity for public comment) occurred post-construction.7 Delays in operating licenses proved enormously costly the last time around.

The first step in permitting – design certification – takes a considerable degree of uncertainty out of permitting and plant design. Design certification means that generic reactors go through an approval process with the NRC irrespective of a particular site. According to the NRC website, there currently are four certified reactor designs:

1. Advanced Boiling Water Reactor design by GE Nuclear Energy (May 1997)
2. System 80+ design by Westinghouse (formerly ABB-Combustion Engineering) (May 1997)
3. AP600 design by Westinghouse (December 1999)
4. AP1000 design (pictured at left) by Westinghouse (January 2006)

During the second step of the NRC's new early permitting – early site permitting (ESP) – the NRC considers issues specific to the proposed site, either concurrently with or independent of an application for construction and operating licensing. Site safety issues, environmental protection issues, and emergency planning are evaluated independent of the review of a specific nuclear plant design. All stakeholders, including the public, are permitted to participate in this phase of permitting.

The third step of the NRC's new early permitting – combined construction and operating licensing (COL) – is perhaps the most dramatic change to the prior permitting process. Issues such as the applicant's qualifications, specific design safety, environmental impacts, operational programs, site safety, and verification of construction with the NRC's Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) are addressed pre-construction. Thus, COL results in approval of a sufficiently detailed plant design and issuance of construction and operation licenses before

the plant is even built. Again, all stakeholders, including the public, are permitted to participate in this phase of permitting.

The combined effect of the new permitting process is detailed design pre-construction, complete and expeditious permitting pre-construction, a significantly higher degree of certainty that permission to operate will be obtained, and a considerable reduction in finance costs. Of course, adequate safety measures are preserved; post-construction ITAAC verification is performed and, if appropriate, a hearing may be held on ITAAC compliance.

Recapping Why We're Better Off Today…

Industry Developments	Why We're Better Off
Target Pricing EPC Contracting	• Certain risks of cost escalation borne by the EPC Contractor. • Incentives for early completion = less direct finance cost.
Modular Construction	• Reduced field manpower and expedited schedule because shop fabrication is done off-site and in parallel with (not sequential to) other construction activities. • Improved quality because off-site conditions typically are more conducive to quality control measures than construction site. • Newer more efficient designs promise reduction in materials and components. • High degree of design completion before ground is broken.
Energy Policy Act of 2005	• The Federal Government shares in certain risks of delay, including those associated with permitting process. • Federal Loan Guarantees make financing more obtainable. • Tax credits enhance financial viability of new nuclear projects.
New Licensing Procedures	• Pre-approved reactors and pre-construction review of designocuments promotes certainty and early completion of design documents. • Considerable reduction in permitting delay due to comprehensive pre-construction permitting process. • Considerable reduction in uncertainty that constructed plant will not be permitted permitting process completed pre-construction. • Post-construction inspections and hearings preserves quality and safety standards.

Still Enormous Risk For The Owner

Even with the considerable strides made since the last round of nuclear construction, the risks for the nuclear project owner still are enormous. Cost estimates for planned large nuclear power plants range from $5 billion to as high as $9 billion, depending on the particular project. There is just no way to make an investment of that proportion and be able to contract away all risk.

Moreover, even with vast improvements in design, technology, and construction, estimates are that the permitting, construction and commissioning of a nuclear plant will still take eight to ten years. While that is a significant improvement from years past, still, a lot can happen in eight to ten years that might affect the viability of the project. The owner, not the EPC contractor, typically owns the risk in material and labor cost increases. And obviously, the contracting process precedes construction and even permitting in some instances, and the owner is on the hook and pays deposits on major and long lead time components. But even with all of these remaining risks, nuclear power has come a long way… just how far, we'll know soon enough.

Renewable Energy Projects, Economic Stimulus

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Since February 17, 2009, the Department of Energy ("DOE") has authorized the expenditure of $16.7 billion towards bolstering the renewable energy industry in the United States pursuant to the American Recovery and Reinvestment Act of 2009 ("ARRA"). In addition to expanding important tax benefits under the Internal Revenue Code (the "Code") associated with investing in renewable energy projects, the ARRA created a robust cash grant system and empowered the DOE to guarantee up to $30 billion worth of loans in the industry. Although the scale of the stimulus package as it relates to renewable energy has given rise to attractive investment opportunities for developers and owners of energy projects in diverse sectors, the complexity of its provisions requires that companies think strategically about how to take full advantage of the incentives offered.

Energy Tax Credit

Under section 48 of the Code, taxpayers are entitled to an energy tax credit ("ETC") for the taxation year during which a renewable energy project is placed in service. The ETC generally equals 30% of the initial tax basis of the project; the tax basis of the project is then reduced by 50% of the ETC (15%). A taxpayer that qualifies for a grant equal to 30% of its basis would consequently reduce its basis in the relevant property by 15%, leaving 85% of the remaining cost subject to depreciation under existing provisions of the tax code.

Prior to the ARRA, the only utility-scale renewable energy projects that qualified for the ETC were solar projects; thus, the ETC was not widely utilized. The ARRA expanded the ETC to include utility-scale wind energy projects provided they are placed in service by December 31, 2012, as well as geothermal, biomass, hydropower, landfill gas, waste-to-energy and marine developments placed in service by December 31, 2013. Moreover, the ETC was expanded to apply to equipment used to manufacture renewable energy components and systems. Since the enactment of the ARRA, roughly $2.3 billion worth of ETCs have been claimed ranging from $75,000 by Bassett Inc. to recycle the carbon in waste streams flowing from coal-fired power plants, to $110 million claimed by United Technologies Corporation to renovate a plant producing fuel efficient jet engines.

The primary consideration in claiming an ETC is a taxpayer's profitability; a taxpayer that does not earn sufficient profits to incur tax liabilities at least equal to the ETC cannot leverage the credit to its maximum benefit. For example, Hemlock Semiconductor Corporation recently received an ETC of $142 million based on an expansion of its facilities in Michigan producing polycrystalline-silicone used in the manufacturing of solar panels. To fully realize the advantages of this tax credit, Hemlock must earn enough profit to ensure that its tax liabilities exceed $142 million. However, developers may also finance projects through tax equity financing where an entity with sufficient tax liability can contribute equity to a project in exchange for the right to, among other things, the ETC generated by the project.

Production Tax Credit

In lieu of the ETC, which is finitely capped at 30% of the tax basis of the project, a taxpayer can claim a production tax credit ("PTC") under section 45 of the Code that is tied to the actual energy produced by a renewable energy development. The PTC entitles a generator to claim (at the 2009 level) 2.1 cents of tax credit per kilowatt-hour of electricity produced and sold to third parties. A project is eligible for the PTC for a period of ten years from the date it is placed in service, and there is no limit with respect to the amount of PTCs a project may receive within that eligibility period. The ARRA extended the sunset for the PTC for wind energy projects through 2012 and for solar projects through 2013. As some indication of the effectiveness of the PTC, wind generation in the United States has increased from 2,000MW in 1993 (when early versions of the PTC were being introduced) to over 25,000MW in 2008.

As the PTC is based on electricity generated and sold, the generator assumes the risk that actual generation deviates from projected levels. Furthermore, the PTC presents the same hurdle as the ETC given that it is a tax credit and not a grant: a taxpayer must have sufficient tax liability to receive the full benefit of the credit. On the other hand, the aggregate benefit from a PTC can

outstrip an ETC if a generator produces energy efficiently enough.

Treasury Grant

1. **Background**

As noted above, a taxpayer must have sufficient tax liability or, as is often the case, a tax equity investor in order to fully leverage an ETC or a PTC. With the advent of the financial crisis in 2008, the number of companies that had sufficient tax liability themselves (or the motivation to engage in tax equity financing) dwindled and the number of ETCs and PTCs quickly followed suit. In response, Congress created a cash grant in lieu of an ETC or a PTC under section 1603 of the ARRA that does not require taxable income, and Congress authorized $3 billion of funding for this program. Grants under this regime can account for up to 30% of the cost of the eligible property payable within 60 days of the later of the date of application or the date on which the property was placed in service. To date, over $1 billion of such grants have been authorized by the administering body, the Department of the Treasury (the "Treasury").

2. **Eligibility and Terms**

Grants are available for "Specified Energy Property" ("SEP"), which includes the following:

- Wind facilities
- Biomass facilities
- Landfill gas facilities
- Trash facilities
- Qualified hydropower facilities
- Marine & hydrokinetic renewable energy facilities
- Qualified fuel cells
- Solar energy
- Certain geothermal projects
- Microturbines
- Combined heat & power systems
- Geothermal heat pumps.

Eligible property under the program includes only property used in a trade or business or held for the production of income. The amount of the grant awarded is dependent on the type of SEP put into service. In general, the grant will equal 10% or 30% of the cost basis of the property. As with the ETC, the grant is not included in gross income, and the adjusted tax basis of the property must be reduced by an amount equal to 50% of the payment.

The applicant must also be the owner or lessee of qualified SEP and must be the original user of the property. Where the applicant is the lessee of the SEP, it must have written consent from the owner waiving its right to receive any grant, as well as its right to claim any ETC or PTC with respect to the property. As long as each direct and indirect partner in a partnership or shareholder or similar interest holder in any other pass-thru entity is eligible to receive a grant, the partnership or other pass-thru entity is eligible to receive a grant.

To receive a grant, the qualified property must be (or have been) placed in service between January 1, 2009 and December 31, 2010 (regardless of when construction begins), or placed in service after 2010 but before a specified "Credit Termination Date" if construction of the property began between January 1, 2009 and December 31, 2010. The Treasury has set forth specific guidelines and safe harbors with respect to when construction is deemed to begin. The application for a grant must in all events be received before October 1, 2011.

Any eligible lessor may elect to pass through the grant to a lessee that is eligible to receive a grant. Such an election will treat the lessee as having acquired the property for an amount equal to the independently assessed fair market value of the property on the date the property is transferred to the lessee. The lessee must also agree to include ratably in gross income over the five year recapture period (discussed below) an amount equal to 50% of the grant.

The Treasury has provided special rules for sale-leaseback transactions. In such a case, a lessee may claim a grant only if three conditions are satisfied: (i) the lessee must be the person who originally placed the property in service; (ii) the property must be sold and leased back by the lessee, or must be leased to the lessee, within three months after the date the property was originally placed in service; and (iii) the lessee and lessor must not make an election to preclude application of the sale-leaseback rules.

If the recipient of a grant disposes of the property to a disqualified person or the property ceases to qualify as SEP within five years from the date the property was placed in service (a "disqualifying event"), 100% of the grant amount must be repaid to the Treasury if the disqualifying event occurs within one year from the date the property was placed in service, with the amount of recapture declining for disqualifying events by 20% in each year thereafter. As a part of the oversight procedure, grant recipients are required to provide annual reports to the Treasury.

3. **Track Record**

It is evident that the cash grant system is paying dividends for a wide variety of companies. For example, Rio Grande Valley Sugar Growers Inc., which is a member-owned cooperative, received a $10.2 million grant in September 2009 based on an expansion of its boiler and the construction of a renewable energy project. The company has suffered serious economic setbacks in recent times caused by natural disasters, poor sugar prices and the financial crisis. President and CEO Steve Bearden noted: "These funds are a true lifeline for the co-op and will help us weather a very difficult and challenging time in the co-op's history. The grant will shore up our company, allow us to reduce debt and will mitigate substantial economic losses…". The infrastructure improvements are expected to eventually allow Rio Grande to fulfill its own power needs and sell excess energy to the Texas electrical grid.

Another illustrative example involves Power Sport Industries Inc., a ball bearing wholesaler, which leveraged its strong cash flow situation to install an $850,000 solar panel on its facility in Pennsylvania. After applying for the Treasury grant and certain other state subsidies, the company recouped just over $500,000 in two months, cut its energy bill in half, projects that it can sell extra renewable energy credits for $48,000, and anticipates having the entire investment paid off within only six years.

These two examples exemplify the broad reach of the grant provisions by demonstrating how both struggling and successful companies can benefit from the stimulus package. Beyond these two companies, the list of grant recipients reveals entities of varying sizes and financial strength from a diversity of markets and in vastly different lines of business.

Loan Guarantee Program

The ARRA also extended the authority of the DOE to issue loan guarantees and appropriated $30 billion for this program. The ARRA amended the Energy Policy Act of 2005 by adding a new section defining eligible technologies for the guarantees and allowing the DOE to enter into guarantees until September 30, 2011. Prior to the ARRA, only "new or significantly improved technologies" were eligible for a guarantee, as compared to technologies already in service in the United States at the time the guarantee was issued.

The ARRA Temporary Loan Program ("Temporary Program") removed the requirement that a project use technology that is new or significantly improved in comparison to technologies already in commercial use, and also added component manufacturing projects to the list of eligible projects. Under the Temporary Program, the following categories of projects are eligible for guarantees:

- Renewable energy systems that generate electricity or thermal energy, and facilities that manufacture related components;
- Electric power transmission systems; and
- Leading edge biofuel projects.

The changes made by the ARRA aim to both expand the scope of eligible projects under the program and to facilitate the loan guarantee process. Geared towards large scale investments, the DOE has concluded 12 loan guarantees which are projected to save an aggregate of 50,000 jobs, result in the capacity to create 3GW of clean energy, and prevent the emission of 30 million tons of carbon dioxide every year.

- The requirements for the Temporary Program are materially the same as those that were applicable prior to the ARRA, including:
- The guaranteed loan cannot exceed 80% of the total project cost;
- The term of the guaranteed loan will be less than or equal to the shorter of 30 years or 90% of the project's expected useful life;
- The eligible project must be located in the United States, but foreign sponsorship of a project is permitted;
- If the DOE guarantees 100% of the project's debt, then the Treasury's Federal Financing Bank must be the lender;
- If the DOE guarantees more than 90% of the project's debt, then the guaranteed portion of the debt cannot be separated or "stripped" from the non-guaranteed portion of the debt for syndication or resale in the secondary market; and
- The borrower must grant to the United States a first priority security interest in the project's assets, provided, however, that the DOE has determined that it has the authority to enter into intercreditor arrangements when it does not guarantee 100% of the project debt.

In addition to these requirements, guarantees under the ARRA must comply with two additional conditions: (i) the project must commence construction on or before September 30, 2011 and (ii) the project must create or retain jobs in the United States. A further beneficial change under the Temporary Program is that project companies are no longer required to pay the Credit Subsidy Cost, as Congress has appropriated funds to do so.

A requirement that survived from the initial program to the Temporary Program is that the project company must have sufficient funds (i.e., debt plus equity) to complete the project. The DOE will continue to require equity support for projects and is expected to favor projects with more significant amounts of equity investment.

SAGE Electrochromics Inc. provides an example of how a company can leverage the Temporary Program in conjunction with other aspects of the renewable energy stimulus regime. SAGE initially secured a $31 million ETC to help fund the construction of a manufacturing plant of electronically tintable glass which could potentially increase the energy efficiency of buildings. On March 5, 2010, SAGE further augmented its financing when it received a $72 million loan guarantee from the DOE. Once in production, SAGE believes that its tintable windows can potentially reduce a building's heating and cooling energy consumption by 25%, reduce power demands by 26%, and cut the cost of lighting by 60%. This project falls squarely within the renewable energy provisions of the ARRA, which endeavor to promote renewable energy while also fueling economic recovery, job creation and the development of globally competitive products.

Conclusion

As the SAGE example illustrates, successfully utilizing the provisions of the ARRA in the field of renewable energy requires careful planning and a sound understanding of how the various provisions interact with one another. While the ETC and PTC can provide tax advantages, those advantages may be meaningless if there are not also sufficient tax liabilities to set these credits off against. A Treasury grant could ensure necessary funding but requires an application, imposes greater burdens and is preclusive of the ETC and PTC. The PTC could also prove more lucrative in the long run if energy is produced efficiently. Overlapping this structure, the temporary loan guarantee regime could assist a company in securing funding, but it appears to be reserved for institutional development projects and includes a number of conditions that must be fulfilled. Importantly, this complexity, combined with the scale of the stimulus package, represents an unprecedented strategic opportunity for companies of all sizes and in a variety of industries looking to cultivate renewable energy developments into viable investment returns.

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