

## Small Businesses Helping Drive Economy: Clean Energy, Clean Sites

*“We should start where most new jobs do – in small businesses, companies that begin when an entrepreneur takes a chance on a dream, or a worker decides its time she became her own boss.” --- President Obama, State of the Union Address, January 27, 2010*

*“Jobs will be our number one focus in 2010. And we’re going to start where most new jobs do – with small businesses.” --- President Obama, Nashua, New Hampshire, February 2, 2010*

Small businesses are and will continue to be the growth engines driving our nation’s economic recovery. Earlier this year, President Obama announced a proposal to take \$30 billion of the money that was repaid by Wall Street banks and create a new Small Business Lending Fund that will provide capital for community banks on Main Street.

When it comes to developing a clean energy economy and responsible environmental management, small businesses<sup>1</sup> are playing a vital role, whether it is in energy efficiency, transportation, Smart Grid deployment, carbon capture and sequestration, renewable energy production, scientific innovation or environmental clean-up.

As of March 10, 2010, small businesses have been selected to receive nearly \$5.4 billion in funding from the Department of Energy, including, grants, contracts, loans/loan guarantees and tax incentives (in partnership with the Department of the Treasury), available under the American Recovery and Reinvestment Act of 2009 (“ARRA” or “Recovery Act”) and other related statutes.<sup>2</sup> These funding opportunities complement the 2,800 loans that the Small Business Administration (“SBA”) approved for renewable energy businesses from 2006 to 2009 worth \$656 million.

Type of DOE Funding		Number of Selections			Amount of Selections (\$MM)		
		SB	Total	% SB	SB	Total	% SB
<b>Formula Grants</b>	<b>Total</b>	<i>No direct grants but indirect benefits.</i>			<b>\$10,899</b>		
<b>Competitive Grants</b>	SBIR Grants	122	122	100%	\$18	\$18	100%
	Other Competitive Grants	139	936	15%	\$870	\$10,421	8%
	<b>Total</b>	<b>261</b>	<b>1058</b>	<b>25%</b>	<b>\$888</b>	<b>\$10,439</b>	<b>9%</b>
<b>Contracts</b>	EERE Contracts	5	27	19%	\$1	\$279	0%
	EM Contracts*	63	84	75%	\$697	\$5,525	13%
	SC Contracts	0	119	0%	\$0	\$1,132	0%
	<b>Total</b>	<b>68</b>	<b>230</b>	<b>30%</b>	<b>\$698</b>	<b>\$6,936</b>	<b>10%</b>
<b>Loans/Loan Guarantees**</b>	Loans (non-Recovery Act)	2	4	50%	\$994	\$8,379	12%
	Loan Guarantees***	6	8	75%	\$1,870	\$10,731	17%
	<b>Total</b>	<b>8</b>	<b>12</b>	<b>67%</b>	<b>\$2,864</b>	<b>\$19,110</b>	<b>15%</b>
<b>Tax Credits/ Grants****</b>	1603 Awards (est. as of 3/10/2010)	252	450	56%	\$421	\$2,720	15%
	48C Tax Credits (est.)	53	183	29%	\$508	\$2,300	22%
	<b>Total</b>	<b>305</b>	<b>633</b>	<b>48%</b>	<b>\$929</b>	<b>\$5,020</b>	<b>19%</b>
<b>TOTAL</b>		<b>642</b>	<b>1933</b>	<b>33%</b>	<b>\$5,379</b>	<b>\$52,404</b>	<b>10%</b>

**Note:** Numbers and percentages are subject to change based on final selection and negotiation of awards.

\*Numbers for EM contracts only include prime contracts while amounts include both prime (\$396.5 mm) and subcontracts (\$300 mm). DOE typically awards >50% of all subcontractor funds to small businesses.

\*\*Includes conditional loan commitments and conditional loan guarantees.

\*\*\*Includes conditional commitments for loan guarantees made under the 1705 Program (ARRA) and 1703 Program (non-ARRA).

\*\*\*\* Recipients of 1603 awards/48C tax credits, awarded by the Department of Treasury, do not have to report whether they are small businesses, so these numbers and amounts are only rough estimates.

<sup>1</sup> For the purposes of this memorandum, a small business is defined as a business having fewer than 500 employees or one that qualifies as a small business under the Small Business Administration’s guidelines which classify based on industry and to North American Industry Classification System codes.

<sup>2</sup> All numbers and amounts in this memorandum are subject to change based on final selection and negotiation of awards.

## **Impact of Recovery Act**

The Recovery Act's investments in small businesses will have a significant impact on job creation. According to the SBA, firms with fewer than 500 employees accounted for 64 percent (or 14.5 million) of the 22.5 million net new jobs (gains minus losses) between 1993 and the third quarter of 2008.<sup>3</sup> These jobs will also accelerate the rate of innovation in a number of different sectors of the clean energy economy as the competitive grant programs demonstrate.<sup>4</sup>

Recovery Act Pillar	Number of Selections			Amount of Selections (\$MM)		
	SB	Total	% SB	SB	Total	% SB
Energy Efficiency	17	167	10%	\$36	\$422	9%
Transportation	24	126	19%	\$495	\$3,505	14%
Grid Modernization	13	189	7%	\$147	\$4,217	3%
Carbon Capture & Sequestration	3	78	4%	\$14	\$1,271	1%
Renewable Energy	66	248	27%	\$111	\$493	23%
Science & Innovation	138	250	55%	\$85	\$531	16%
<b>Total</b>	<b>261</b>	<b>1058</b>	<b>25%</b>	<b>\$888</b>	<b>\$10,439</b>	<b>9%</b>

Many of these jobs will be created indirectly through companies that support Recovery Act awardees or benefit from increased opportunities in the clean technology industry. For example, although small businesses did not receive direct awards under the energy efficiency community block grant, weatherization assistance and state energy grant programs, small businesses are benefitting substantially from those energy efficiency programs through subcontracts and the ripple effects of Recovery Act awards on the supply chain.<sup>5</sup>

## **Saving money and improving competitiveness through energy efficiency**

Small businesses are making communities greener and putting money back in peoples' pockets with help from almost \$11 billion in awards for energy efficiency community block grants, weatherization assistance and state energy grants. States and territories receiving funds under the Weatherization Assistance Program, for example, utilize a pool of approximately 2,500-3,000 private contractors, over 50% of which have 5-25 employees.

In addition to creating work for contractors insulating homes and installing efficient appliances in low-income communities, these initiatives are also helping small businesses that manufacture these products as well as saving existing businesses money on heating and cooling bills.

- **Small businesses have received grants for a number of projects that will improve energy efficiency in the information and communications technology (“ICT”) sectors.** Specifically, small businesses have received 5 of 14 grants (36% of total), amounting to \$20.2 million (43% of the \$47 million in total grants). These energy efficiency projects will reduce energy use and carbon pollution, while helping to develop strong, competitive domestic data processing, data storage, and telecommunications industries.
- **Small businesses have also received grants for a number of projects designed to advance research and development of next-generation, high-efficiency solid-state lighting.**

<sup>3</sup> See <http://www.sba.gov/advo/stats/sbfaq.pdf>.

<sup>4</sup> Small businesses were selected to receive funding under 22 of the Recovery Act's 48 competitive grant programs.

<sup>5</sup> Job estimates are based on company forecasts and methodologies.

Specifically, small businesses have received 4 of 23 grants (17% of total), amounting to more than \$8.6 million (19% of the \$46 million in total grants). The investment in these four projects has the potential to create more than 50 direct jobs and many more indirect jobs by helping to establish or strengthen the U.S. manufacturing base for solid-state lighting.

The following stories show some of the ways that investments in energy efficiency are benefitting small businesses:

- ***Nonprofit housing provider remains in business with help from weatherization award (Atlanta, GA):*** Victor Gomez founded **LBP Consortium Inc. (“LBP”)**, a nonprofit affordable housing provider in Georgia, to focus on retrofitting homes for children younger than 10 and seniors older than 65. He has been working in the retrofitting business for 16 years now, making American homes safer and more energy-efficient. This past year, LBP almost had to close its doors due to the economic downturn as his clients’ needs grew by about 900 percent and donations dropped precipitously. However, thanks to an \$8.8 million award to a local community action agency to weatherize homes that created 44 jobs, LBP received enough funding to keep on four workers who were slated to become jobless just before the holidays.
- ***Homeowners and window industry benefit from stimulus (Bensalem, PA):*** **Accu-Weld** is a family-owned windows and doors company in Bensalem, PA. Although the company had to lay off 70 employees in 2008, the surge in weatherization improvements in homes across the country has allowed the company to increase its almost 150 employees’ hours from 32 to 45 hours each week. The employees make as much as \$22 an hour, more than triple the minimum wage in Pennsylvania, as they work to meet the needs of dealers who are demanding more efficient products. The company is optimistic about an increase in sales in 2010 if the economy continues to recover.
- ***ICT grant accelerates market introduction of energy saving server (Santa Clara, CA):*** **SeaMicro Inc. (“SeaMicro”)** is a Silicon Valley start-up with venture capital backing that has created a prototype server—both software and hardware-- that uses 25% of the energy, takes 25% of the space, and is less costly to manufacture than today's servers. The technology has the potential to dramatically reduce the consumption of electric power by the nation’s data centers, which use approximately 1.5% of U.S. electric power, more than half of which goes to servers. An ICT grant of \$9.3 million will enable SeaMicro to hire 21 new employees and accelerate the engineering and quality-assurance testing that is needed prior to commercialization. SeaMicro estimates that the grant will enable it to reach the market with its energy saving server at least a year ahead of schedule.
- ***Solid-state lighting grant helps establish U.S. manufacturing base for organic light-emitting diodes (OLEDs) (Ewing, NJ):*** The DOE awarded **Universal Display Corporation (“UDC”)** a \$4 million ARRA grant under the Building Technologies Program (“BTP”) to scale and transfer its technologies to a partner pilot OLED manufacturing line to be set up in the U.S. The project will facilitate the growth of the embryonic OLED lighting industry by providing prototype lighting panels to U.S. luminaire manufacturers to incorporate into products, to facilitate testing of design and to gauge customer acceptance. Part of a new DOE initiative designed to help establish and maintain U.S. leadership in solid-state lighting manufacturing, the funding will help UDC lay the foundation for the development of an OLED lighting industry in the U.S.

## Restructuring the transportation sector to improve competitiveness and reduce petroleum imports

Small businesses are playing a key role in the development and expansion of a domestic manufacturing base to support electric and hybrid vehicles through DOE grant and loan programs. Small businesses are also benefitting throughout the supply chain through the increased demand for their goods and services. Three programs in particular have had a particularly strong impact on small businesses: the Advanced Battery Manufacturing Grants Program, Transportation Electrification Program and Advanced Technology Vehicles Manufacturing (“ATVM”) Loan Program (a non-Recovery Act program). The Battery and Transportation Electrification programs will accelerate the development of U.S. manufacturing for batteries and electric drive components as well as the deployment of electric vehicles. The ATVM Loan Program is helping to expand the US auto sector’s manufacturing capabilities for advanced technology vehicles that improve fuel efficiency, using both advanced combustion engines and new electric and hybrid drive trains.

- Advanced Battery Manufacturing Program has awarded \$2 billion to 30 new advanced battery projects and electric drive projects. Small businesses have received 9 of the 32 grants<sup>6</sup> (28% of total) amounting to \$122.7 million (6% of total).
- Transportation Electrification Program has awarded \$400 million to 18 projects. As of March 10, small businesses have received 2 of the 18 grants (11% of total) amounting to \$110 million (28% of total).
- Advanced Technology Vehicles Manufacturing Loan Program has offered 3 loans and 1 conditional loan commitment amounting to \$8.4 billion.<sup>7</sup> Small businesses have received 2 of the 4 conditional loan commitments awarded (3 closed) thus far (50% of total), amounting to \$993 million (12% of total).

The following stories show some of the ways that investments in transportation are benefitting small businesses:

- ***Component program allows electric propulsion system manufacturer to expand (Frederick, CO): UQM Technologies, Inc. (“UQM”)*** of Frederick, Colorado is a well-established supplier of prototype electric propulsion and generator systems, including electric rotating machines and drive electronics. The company has supplied these systems for over two decades to both established and aspiring automakers. In 2006, UQM completed an R&D project with the Energy Efficiency and Renewable Energy (“EERE”) Vehicle Technologies Program<sup>8</sup> to design a power-dense motor for use in electric drive vehicles. UQM is now positioned to take its technology into production, establishing a U.S. volume manufacturer of electric drive systems. The \$45 million grant that UQM received under the Recovery Act will enable UQM to establish manufacturing facilities for production volumes of 120,000 electric drive systems per year, powering all-electric, hybrid-electric, plug-in hybrid-electric passenger cars and hybrid-electric trucks and buses, creating up to 3,000 jobs.

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<sup>6</sup> Includes grants to two small businesses performing NEPA assessments on one battery project.

<sup>7</sup> The total amount of original conditional commitments was \$8.6 billion, but one loan guarantee decreased in value prior to closing.

<sup>8</sup> The Vehicle Technologies Program is developing more energy efficient and environmentally friendly highway transportation technologies that will enable America to use less petroleum. The long-term aim is to develop “leap frog” technologies that will provide Americans with greater freedom of mobility and energy security, while lowering costs and reducing impacts on the environment.

- ***ATVM loans enable two start-up car makers to move into large-scale production (CA and Wilmington, DE):***
  - **Tesla Motors (“Tesla”)** has received a \$465 million loan that will advance the production of electric vehicles. The first loan will finance a manufacturing facility that will produce up to 20,000 Tesla Model S sedans by the end of 2013. The all-electric sedan consumes no gasoline and runs entirely on electricity from any conventional 120V or 220V outlet. This integrated facility is expected to create 1,000 jobs in southern California. The second part of the loan will support a facility to manufacture battery packs and electric drive trains to be used in Tesla vehicles and in vehicles built by other automakers. Tesla expects the new facility to employ 650 people in the Bay Area of northern California.
  - **Fisker Automotive (“Fisker”)** has received a \$528.7 million conditional loan commitment for the development of two lines of plug-in hybrid vehicles. These vehicles can travel up to 50 miles on electricity before they switch to an efficient gasoline engine. Fisker expects to ultimately manufacture both lines of vehicles at a recently shutdown GM factory in Wilmington, Delaware and employ 2,000 workers, re-hiring many workers laid off when GM shut down its factory in June. Fisker estimates that the two vehicle platforms will also create or save an additional 3,000 jobs for domestic parts suppliers.

### **Increasing customer choice through grid modernization**

Small businesses are helping drive the evolution to a stronger, smarter, more efficient electricity infrastructure that will increase customer choice, as well as improve network safety and reliability. The DOE has made project selections worth almost \$4.3 billion, nearly all of the \$4.5 billion allocated under the Recovery Act. The DOE has invested in a broad range of technologies that will be matched by \$4.7 billion in industry funding for a total public-private investment worth over \$8.1 billion.

The Smart Grid Investment Grant (“SGIG”) Program has allocated \$3.4 billion in grants to 100 projects. Small businesses have received 6 of the 100 grants (6% of total) amounting to \$82 million (2.3% of total). The grants to electric cooperatives, investor-owned utilities, municipal electric utilities, and technology companies under the SGIG Program will also benefit small businesses through contracts to deploy millions of smart meters, other grid hardware and the associated information systems integration.

Small businesses also received grants for Smart Grid regional and energy storage demonstration projects. The 40 demonstration projects include large-scale energy storage, smart meters, distribution and transmission system monitoring and control devices, and a range of other smart technologies. Small businesses received 7 of 40 total grants (18%) amounting to \$65.3 million (10% of the \$668 million in total grants).

The Recovery Act is also supporting small businesses indirectly through the Bonneville Power Administration (“BPA”) and Western Area Power Authority’s (“WAPA”) \$3.25 billion in each in borrowing authority. Among the projects BPA is using the Recovery Act funds to build is a major new transmission project in Oregon and Washington: the McNary- John Day 500-kilovolt transmission line. When energized in 2012, the line will allow BPA to provide transmission service to 575 megawatts (“MW”) of new wind energy. The \$343 million project will create 100-200 well paying jobs at its peak and employ small businesses through subcontracts.

WAPA will use its new borrowing authority to help build the \$213 million Montana-Alberta Tie Limited (“MATL”) transmission project between Great Falls, Montana, and Lethbridge, Alberta.

Almost two-thirds of the 214-mile transmission line will be located on U.S. soil, creating American jobs and allowing for the continued expansion of renewable energy production. Once energized, as early as 2010, the 230-kilovolt transmission project will be capable of delivering 300-600 megawatts of clean, renewable wind energy.

The following stories show some of the ways that investments in the Smart Grid are benefitting small businesses:

- ***Smart Grid solutions company stands to gain from partnerships with many US utilities (Redwood City, CA):*** Although **Silver Spring Networks** did not receive a direct grant under the SGIG Program, it is still a big winner through its partnerships with many utilities around the country. For instance, Florida Power & Light (“FPL”) received a \$200 million grant for its Energy Smart Miami project, which represents the foundation of a \$700 million investment to deploy Smart Meters to every residential FPL customer in Florida. **Silver Spring** provides the hardware, software and services that connect every device on the grid, creating a unified Smart Energy Platform. Other utility clients of Silver Spring who received SGIG grants include Pepco Holdings, Inc, Oklahoma Gas & Electric and American Electric Power.
- ***Small and small disadvantaged businesses benefit from Bonneville Power Administration (BPA) and Western Area Power Administration (WAPA) projects (OR and WA, MT):*** Small and small disadvantaged businesses have received over \$4 million in subcontracts related to the McNary- John Day transmission line project. BPA has bought materials from small fabrication and supply companies and also enlisted small service businesses to complete portions of the work. **Tonbridge Power Inc. (“Tonbridge”)**, a Canadian company, which is funding a portion of the WAPA MATL project, has fewer than 500 employees and has also employed ten contractors that qualify as small businesses.

### **Developing carbon capture and sequestration can compete economically**

The Recovery Act appropriated \$3.4 billion for the research, development and deployment of technologies to use coal more cleanly and efficiently. Of this amount, small businesses have received grants to conduct site characterization of promising geological formations for CO<sub>2</sub> storage. These projects will increase understanding of the potential for these formations to safely and permanently store CO<sub>2</sub>. Small businesses received 3 of the 11 grants (27% of total) amounting to \$13.8 million (27% of the \$50.6 million in total grants).

Small businesses also received grants under the more than \$100 million Technology Area 2 of the \$1.4 billion competitive solicitation for a range of industrial carbon capture and energy efficiency improvement projects. Small businesses received 6 of the 12 grants from Area 2 to research innovative concepts for beneficial use of CO<sub>2</sub> are competing for the \$127 million in total grants. The small businesses that received awards could drive breakthrough innovations in the development of beneficial uses of CO<sub>2</sub> as an option.

### **Developing the U.S. into the global leader in renewable energy**

Small businesses are sponsoring the development of local renewable energy projects and helping to establish a renewable energy manufacturing industry through the receipt of loan guarantees, grants and tax incentives. Small businesses are also benefitting throughout the supply chain through the increased demand for their goods and services. DOE will support small business by using Advanced Manufacturing Tax Credits (“48C tax credits”) for renewables manufacturing. The 1603 awards have also unlocked frozen capital to finance local renewable energy projects while EERE competitive grants are impacting small businesses that are developing cutting edge clean energy technologies.

- The Section 1703 Loan Guarantee Program, established by the Energy Policy Act of 2005, can support over \$51 billion dollars in loan guarantees for a range of energy projects that reduce greenhouse gas emissions and pollutants and employ new or significantly improved technologies (“1703 Program”). The Recovery Act authorized the Loan Guarantee Program to make additional loan guarantees through the appropriation of \$4 billion to cover credit subsidy costs.<sup>9</sup> The credit subsidy cost will support an estimated \$32-35 billion in loan guarantees for certain conventional renewable energy systems, electric transmission systems and leading edge biofuels projects that commence construction no later than September 30, 2011 (“1705 Program”). The Loan Guarantee Program Office has announced eight conditional loan guarantees (one closed) under the 1703 and 1705 Programs amounting to over \$10 billion. **As of March 10, 2010, small businesses have received 6 of the 8 conditional loan guarantees (75% of total) awarded thus far amounting to \$1.87 billion (17% of total). This percentage will likely decrease as the program expands and additional conditional loan guarantees are announced.**
- Under the 48C Program, \$2.3 billion in 48C tax credits have been allocated for 183 projects in 43 states, which will support total capital investments of almost \$7.7 billion in the domestic manufacturing of advanced clean energy technologies including solar, wind and efficiency and energy management technologies. An additional \$5 billion may be appropriated this year. **We estimate that small businesses received between 40 and 65 of the 183 grants (22% to 36% of total) amounting to between \$436 and \$579 million (19% to 25% of \$2.3 billion in total grants).**<sup>10</sup>
- As of March 10, 2010, the Department of Treasury had announced 1603 awards of nearly \$2.72 billion to 450 domestic renewable energy projects in 41 states. The projects include wind, solar, geothermal, hydropower, combined heat and power among other technologies. The program is not capped and we expect to provide an estimated \$5 billion worth of awards to support nearly \$15 billion in projects under the Recovery Act. The 1603 awards have benefitted small developers of renewable energy projects as well as small businesses that install renewable energy units to power their facilities. **We estimate that small businesses have received between 234-270 of the 450 awards made thus far (52% to 60% of total) amounting to between \$381 and \$462 million (14% to 17% of \$2.72 billion in total awards).**<sup>11</sup>
- Under the select competitive grant programs for renewable energy (wind, solar, geothermal and other crosscutting projects), small businesses received 65 of 250 total grants (26% of total) amounting to \$145 million (30% of the \$491 million in total grants).

The following stories show some of the ways that investments in renewable energy are directly benefitting small businesses:

- ***Loan guarantee is good news for energy storage company (Stephentown, NY):*** On July 2, 2009, DOE Secretary Steven Chu announced a conditional loan guarantee for **Beacon Power (“Beacon”)**. **Beacon** was offered a conditional commitment of \$43 million to support the construction of its 20 MW flywheel energy storage plant in Stephenstown, New York that will help ensure the reliable delivery of renewable energy to the electricity grid.

<sup>9</sup> This original appropriation of \$6 billion was decreased by \$2 billion to fund a portion of the Cash-for-Clunkers program.

<sup>10</sup> Recipients of 48C tax credits do not have to report whether they are small businesses, so these numbers and amounts are only rough estimates based on public information about the company size.

<sup>11</sup> Recipients of 1603 awards do not have to report whether they are a small business, so these numbers and amounts are only rough estimates based on public information about the company size.

- **48C tax credit will enable wind component manufacturer to double its production (Bedford Heights, OH): Cardinal Fastener & Specialty Co., Inc. (“Cardinal”)** is the largest manufacturer of hot forged, large diameter fasteners in North America, a component that is used in wind turbines. With a 48C tax credit of \$480,000, Cardinal will be able to expand its manufacturing facility to produce twice as many hot forged, critical fasteners used in wind turbines – transportation bolts, tower bolts, nacelle bolts and blade studs. The facility expansion is expected to create operating jobs.
- **48C tax credit will jumpstart growth for leading innovator of energy storage systems (Menomonee Falls, WI): ZBB Energy Corporation (“ZBB”)** is breaking industry ground in the energy storage system space by providing turn-key energy storage systems to utility companies, industrial and commercial organizations and renewable energy generators. These energy storage systems will be crucial to meeting the need of the expanding renewable energy sector, particularly the solar and wind industries, which desperately need technologies to store energy and re-supply power during high consumer peak times. The receipt of a \$14.9 million 48C tax credit will allow ZBB to increase its workforce.
- **1603 award provides a much needed boost for wind developer (Danforth, ME and Milford, UT): First Wind**, a wind energy developer headquartered in Boston, Massachusetts, has struggled to obtain financing for the development of several wind farms during the economic downturn. However, with help from \$115 million in 1603 awards, First Wind has been able to continue development of several wind power projects in 2009 that would not otherwise have moved forward. First Wind’s Stetson II 26 MW wind project in Danforth, Maine will create an estimated 200 construction jobs, 5-10 permanent jobs and 125 jobs across the country that partially support the facility. The Milford Wind Corridor, Phase II 102 MW wind project in Milford, Utah will support around 250 construction jobs, 15 permanent jobs and 125 jobs across the country in support of the project. First Wind has also received a conditional commitment for a \$117 million DOE loan guarantee to finance construction of a 30 MW generation project to be located in the town of Kahuku on the north end of the island of Oahu, HI.
- **1603 awards help small businesses install renewable energy equipment to power their own facilities (northern MI):** 1603 awards have directly impacted small businesses in the northern part of Michigan by helping to defray the high up-front cost of installing renewable energy systems in their own facilities. **Collins & Company**, an electrical contractor, employs a staff of approximately 3 people and received \$20,000 to install two small wind turbines (2.4 kilowatt peak output) and a photovoltaic system. The energy system will power a greenhouse, maintenance garages, agricultural irrigation systems and a biodiesel processor while allowing excess energy to be returned to the grid. **Accent Building Corp.** is a small residential and light commercial contractor and specialty product dealer of renewable energy and energy efficient products. The company received \$5,000 to install a small wind turbine on its property that is charging a battery bank to supply the corporate office. Both grants will help the small businesses save money on their electric bills and free up funds to reinvest in their companies.
- **Solar grant gives solar company a head start over foreign competition (Redwood City, CA):** The DOE awarded **XeroCoat Inc. (“XeroCoat”)** a \$1.36 million grant under the Solar Energy Technologies Program (“SETP”)<sup>12</sup> to develop a method for applying its patented anti-reflective coating technology directly onto assembled solar panels. If XeroCoat had not received the grant, there is a good chance the project would never have happened. Without the funding, XeroCoat may have lost ground to international competitors. Now, the company believes it has a head start instead of having to play catch up. The project has also created about five positions at XeroCoat and provided work for several manufacturers.

<sup>12</sup> The DOE received \$117.6 million under the Recovery Act for the SETP, which aims to reduce costs and emissions, and to improve the readiness of the green-collar workforce.



- ***Biofuels grant provides critical funding to support construction of start-up's integrated algae fuel refinery (Riverside, PA): Solazyme Inc. ("Solazyme")***, a San Francisco-based company, is a true start-up success story. Founded in 2003 by a scientist and entrepreneur that were among the first people to focus on algae as an alternative to conventional fuels, the company has pioneered a new technology to produce biodiesel and green diesel from algae oil. Like most emerging technology companies, Solazyme faced a huge obstacle in obtaining adequate funds to commercialize its technology. However, with a \$21.8 million ARRA grant under the Biomass Program, Solazyme will now be able to build its first integrated algae fuel refinery and help lay the foundation for subsequent large-scale development of an "advanced biofuels" industry. The project will create jobs in California and Pennsylvania.
- ***Biofuels grant accelerates deployment of highly efficient, low carbon and economical biorefinery technology (Lakewood, CO): ZeaChem Inc. ("ZeaChem")*** is another start-up success story in the advanced biofuels industry. ZeaChem, a developer of biorefineries for the conversion of biomass into fuels and chemicals, is now one step closer to commercialization of its innovative technology with the award of a \$25 million ARRA grant under the Biomass Program. ZeaChem's innovative technology generates a significant capital cost advantage compared to other cellulosic technologies by extracting the most energy possible from biomass feedstocks, which allows it to significantly increase output while reducing both production costs and environmental impacts. The company will use the grant in conjunction with ZeaChem's existing investment to support construction of the company's first cellulosic biorefinery. The biorefinery will have capacity of 250,000 gallons per year and is proposed to be built in Boardman, Oregon.

The following stories show some of the ways that investments in renewable energy are indirectly benefitting small businesses throughout the supply chain:

- ***Fastener manufacturer continues on upward trajectory with increased demand for wind turbine components (Bedford Heights, OH): Cardinal*** is also benefitting from the growth of the renewable energy manufacturing industry that the Recovery Act has promoted through a combination of loan guarantees and grants. As previously noted, Cardinal is the largest manufacturer of hot forged, large diameter fasteners in North America, a component that is used in wind turbines. Since December 2009, Cardinal has increased its workforce by 20% to 44 employees and hopes to reach over 90 by years end.
- ***Manufacturer of wind measurement systems is poised to grow with expanding markets for green technologies (Hinesburg, VT): NRG Systems*** has made products to help its customers measure and understand the wind since 1982. Now, because of the opportunities that the Recovery Act has created for renewable energy companies, small businesses like NRG Systems are poised to grow and hire new people as the demand grows for proven wind measurement and turbine control equipment.
- ***Manufacturer of geothermal heating pumps likely to benefit from Recovery Act funding (Fort Wayne, IN): WaterFurnace International Inc. ("WaterFurnace")*** has not received any Recovery Act funds, it is poised to benefit from the \$50 million in Recovery Act funding for geothermal heat pumps and is currently benefitting from residential and commercial renewable energy tax credits<sup>13</sup> WaterFurnace is a leading manufacturer of geothermal heating pumps for both residential and commercial applications. WaterFurnace's 115,000-square-foot headquarters serves as a model for commercial geothermal installations worldwide. A pond loop

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<sup>13</sup> Funding under this program will support the deployment of geothermal heat pumps through commercial-scale and community-wide residential demonstration projects. These projects will help support the geothermal industry by addressing market barriers and supporting the long-term development of this important market.

geothermal system and 41 of the company's own geothermal units meet all heating and cooling requirements for the facility.

### **Re-asserting U.S. leadership in science, technology and innovation**

Small businesses are integral to restoring U.S. global leadership in science and technology and are receiving a sizable portion of the \$2 billion in Recovery Act funding to drive the next generation breakthroughs in energy. The Advanced Research Projects Agency-Energy (“ARPA-E”) Program received \$400 million under the Recovery Act to fund R&D for transformational energy technologies. ARPA-E’s first \$151 million open solicitation resulted in the submission of thousands of concept papers, approximately 50% of which included small businesses in their research teams. To date, small businesses have received 43% of total grants awarded (16 of 37 grants) compared with 35% for educational institutions and 19% for large corporations. The awards to small businesses amount to \$68 million (45% of \$151 million in total awards). Small businesses that do not receive grants are also benefitting through partnerships with universities, national labs and large corporations that receive grants under the program.

The following stories show some of the ways that investments in scientific innovation are benefitting small businesses:

- ***Start-up’s chance of success improves considerably with grant to develop high efficiency wind turbine (Wilbraham, MA): FloDesign Wind Turbine Corp. (“FloDesign Wind”)*** is a fledgling start-up that won an MIT clean energy competition last year. The company is developing a new high efficiency shrouded wind turbine capable of delivering significantly more energy per unit of swept area. FloDesign Wind’s \$8.3 million ARPA-E grant represents a major increase in resources for the company that will have a dramatic effect on its ability to ramp up technology development.
- ***Partnership with university enables start-up to develop emerging technology (St. Paul, MN):*** The University of Minnesota received \$2.2 million to produce liquid hydrocarbon transportation fuels directly from sunlight, water and CO<sub>2</sub> using an artificial symbiotic colony of photosynthetic cyanobacteria and *Shewanella*, a hydrocarbon producing bacteria. It will be teaming up with **BioCee, Inc. (“BioCee”)**, an emerging technology company, which would not have had the resources to work on the project without the university grant. For BioCee, like many other emerging technology companies that have limited resources, the Recovery Act has stepped in to bridge a funding gap.

### **Reducing legacy nuclear waste footprint**

Projects funded by the Office of Environmental Management (“EM”) have had a dramatic effect on small businesses through ARRA procurement-related contracts.<sup>14</sup> EM received \$6 billion under the Recovery Act to accelerate environmental clean up work and has created or saved over 14,000 jobs across 12 states. Projects identified for funding have focused on accelerating cleanup of soil and groundwater, transportation and disposal of waste, and clearing and demolishing former weapons complex facilities.

Under the Recovery Act in FY 2009, EM provided funding of \$396.5 million for small business prime contracts. In addition, approximately \$300 million was provided to small businesses through

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<sup>14</sup> The EM is responsible for the risk reduction and cleanup of the environmental legacy of the nation’s nuclear weapons program, one of the largest, most diverse, and technically complex environmental programs in the world.

subcontracts. Of the 84 prime contracts receiving Recovery Act funding, 63 were small businesses. Small businesses have received close to 7 percent of the FY 2009 Recovery Act EM funding (\$5.5 billion), substantially exceeding the goal of 4.8 percent, representing almost 140 percent of the funding target of \$288 million.

The following stories show some of the ways that investments in clean up are benefitting small businesses:

- ***Portsmouth gaseous diffusion plant creates work for small businesses (southern OH):*** In 2009, the DOE's Portsmouth/Paducah Project Office, through its remediation contractor LATA/Parallax Portsmouth, a small business, awarded nearly \$2 million in small business subcontracts to support projects funded by the Recovery Act at the Portsmouth Gaseous Diffusion Plant in southern Ohio. The contracts are supporting accelerated cleanup on five projects and employ about 60 workers.
  - **Geiger Brothers** of Jackson, Ohio is a general mechanical contractor that has been in business since 1909. The small company received a huge boost through the receipt of more than \$520,000 from LATA/Parallax to provide field trailer installations, a lighting project to support two-shift operations and the supply of equipment for ARRA projects.
  - **A.J. Stockmeister** is another small business in Jackson, Ohio that has benefited from ARRA funding. As a general contracting company providing mechanical contracting and specialty work, A.J. Stockmeister received a contract from LATA/Parallax for over \$840,000 to perform asbestos removal from two ARRA projects, the X-533 Electrical Switchyard and the X-760 Chemical Engineering Building Decontamination and Decommissioning Projects. The stimulus has been a boost for the company and will provide work through spring 2010.

### **Strengthening small business innovation research and technology transfer for near-term commercialization, manufacturing and jobs creation**

The Small Business Innovation Research ("SBIR") Program is supporting small business innovation research, development and deployment of clean energy technologies through \$78 million in Recovery Act funding, awarded through a process tailored to enhance commercialization and job creation.<sup>15</sup> These funds will create and retain several hundred full-time jobs over the next 30 months. To date, the SBIR Program has awarded 122 Recovery Act grants, in larger-than-usual amounts of up to \$150,000 to 106 small advanced technology firms across the U.S. The more than \$18 million in grants primarily supports projects in the areas of energy efficiency, renewable energy, Smart Grid and carbon capture and sequestration. Companies that demonstrate successful results and show the potential to meet market needs will be eligible for \$60 million in an accelerated second round of grants to be awarded in July 2010.

The following stories show some of the ways that SBIR grants are benefitting small businesses:

- ***Research company's innovations could impact fuel efficient vehicles, electric utilities and biodiesel plants (Wheat Ridge, CO):*** **TDA Research Inc. ("TDA")**, which has a history of successfully commercializing SBIR funded research, plans to use its three SBIR grants totaling \$450,000 to pursue a diverse group of projects with potentially significant markets. In the process, TDA will bring on six additional employees.

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<sup>15</sup> The SBIR Program is designed to provide early stage financial support for technology-based small businesses developing new cost-effective scientific and engineering solutions to challenging problems. The SBIR Program is considered the DOE's best source of risk capital for U.S. small businesses that are developing and commercializing manufacturing technologies and processes.

In one project, TDA will be teaming up with a large carbon manufacturer (MeadWestvaco) to develop the manufacturing process for high surface area, high-performance carbons that are the main components of ultracapacitors, a new fast-charge, fast-discharge energy storage technology that captures regenerative braking energy and provides local energy storage in hybrid/micro-hybrid vehicles.

In another project, TDA will be working with a major US refinery to use high surface area carbons in an electrically driven salt removal process that would make unusable brackish water clean enough to use in power plants (or even clean enough to drink). Cooling water for electrical power generation is the largest industrial use of water in the U.S. and abroad.

TDA will also be developing an integrated catalytic reactor and product separation system that allows biodiesel to be made economically from cheap, non-food grade oils and waste products. The conversion process is cleaner and less expensive to operate than conventional liquid-based catalyzed processes.

- ***Manufacturer and supplier of industrial membranes staffs up with scientists and engineers (Wilmington, DE): Compact Membrane Systems (“CMS”)***, a technology company that develops coating and membrane manufacturing technologies, has not wasted any time putting its \$600,000 in SBIR grants to good use. It has already hired five engineers/scientists and may hire a sixth. In addition to allowing CMS to develop metal nanoparticle fluoropolymer composites for use as catalysts for commercially significant organic syntheses, the SBIR grants will enable CMS to partner with the University of Pennsylvania and secure the expertise of a world renowned expert in highly fluorinated polymer structure.

### **Next Steps**

There is still more that can be done to create opportunities for small businesses in the clean energy economy. To that end, DOE is working to make existing programs more accessible to small businesses while introducing new programs that target small businesses. The SBIR program is expanding its focus on technology commercialization. The EM program is holding contractors accountable for expanding small business opportunities at the subcontract level. All programs are increasing their focus on innovation and looking for small company partners for their major programs.

The Recovery Act has had a positive impact on small businesses through the nearly \$5.4 billion in direct grants, contracts and conditional commitments for loans/loan guarantees awarded thus far, as well as through indirect benefits that are accruing to small businesses throughout the supply chain. The Recovery Act, with small businesses playing a leading role, represents a downpayment on the nation’s energy and environmental future and a downpayment on accelerating innovation and job creation in partnership with small businesses. The success of small businesses is essential for the recovery of the U.S. economy, job creation and America’s global competitiveness and the Recovery Act has gone a long way toward positioning small businesses for leadership in the clean energy economy.