

AS PREPARED FOR DELIVERY

**CLEAN ENERGY STIMULUS:
ONE YEAR LATER**

**CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES
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[Acknowledgements.]

Sam Fortune is a single father of three in Coshocton, Ohio. He lost his job during Christmas week 2007 and struggled for more than a year to find work. Finally, he saw an ad in a local paper announcing a job as a heating technician under a local home weatherization program. Sam got the job and has been helping people in his community cut heating bills ever since.

Elizabeth Rolinski is a plant manager for Johnson Controls, a 125-year old American company. Rolinski is in charge of reopening the company's Holland, Michigan, manufacturing facility, which will make next-generation lithium ion batteries. The plant will provide more than 550 manufacturing jobs and is expected to produce at least three times as many indirect jobs in the Holland community.

Michael Harvey is chief technical officer at XeroCoat, a California startup that makes parts for solar energy systems. A year ago, Harvey was having trouble finding funding for a small but promising project to lower the cost of solar energy. It looked like the company would fall behind foreign competitors. Today, XeroCoat is pursuing that project and has already created five new jobs in the process.

What do these people have in common? Along with millions of Americans, each one is doing work made possible by the American Recovery and Reinvestment Act – landmark legislation signed into law by President Obama one year ago today.

The Recovery Act was a sweeping economic recovery package, designed to help rescue a nation on the edge of economic abyss. For millions of Americans, its impacts have already been profound. Public and private forecasters ranging from the Council of Economic Advisers to Moody's Economy and IHS Global now say the Recovery Act is responsible for about 2 million

jobs nationwide. And the non-partisan Congressional Budget Office, widely respected by Members of Congress on both sides of the aisle, says that number could be as high as 2.4 million.

Furthermore, within the legislation was the largest one-time investment in clean energy in U.S. history. So when I received your invitation to speak at this timely conference on “Green Stimulus,” I was delighted to accept, both to help take stock of progress to date and offer thoughts on the road ahead.

To take stock of progress, recall where we were one year ago. In December 2008, the U.S. economy lost 673,000 jobs. In January 2009, it lost 779,000. The economy was in freefall. As a result of the financial crisis, affordable credit had dried up. Many Americans were unable to access loans for their businesses, education and mortgages. Home values were plummeting. Across the political spectrum, there was real fear of another Great Depression.

Congress responded with the American Recovery and Reinvestment Act, which President Obama signed less than one month after taking office. The Act pledged \$786 billion to pull the economy back from the brink. It was divided into three parts:

- One-third for tax cuts for small businesses and working families.
- One-third for emergency relief: extending unemployment benefits, reducing the cost of health insurance and providing assistance to state and local governments facing enormous budget shortfalls.
- A final third for investments to put Americans to work on critical projects to keep us competitive in the 21st century. This includes computerizing medical records; medical research; renovating classrooms and school laboratories; upgrading roads and railways – and, most important for our discussion today, making historic investments in clean energy.

This is where the Department of Energy comes in.

I’ve worked at several places in the federal government, but before last year I had never worked at the Department of Energy. I can report that DOE’s mission is wide-ranging. DOE is the federal agency in charge of clean energy technology deployment; the nation’s largest funder of basic science research; and the manager of our nation’s nuclear arsenal and associated environmental cleanup.

I can also report that this is a very exciting time to be at the Department of Energy. It's exciting in large part because we have a transformational leader in Energy Secretary Steven Chu. As many people here know, Dr. Chu was awarded the 1997 Nobel Prize in Physics. Five years ago, he changed the course of his distinguished career to focus on energy, leaving Stanford University to direct Lawrence Berkeley National Laboratory. I must say, I sometimes sit in budget meetings and wonder, "What was it like before the Secretary of Energy knew more about most topics he's being briefed on than most people briefing him?"

Secretary Chu is also a skilled manager. This is important for running any organization the size and breadth of DOE, but it's especially important because of the legislation we're discussing today. DOE's annual budget for energy, science and clean-up programs is roughly \$17 billion. Through the Recovery Act alone, DOE received almost \$37 billion in appropriations. These funds must be awarded in less than 20 months (by September 30, 2010) and spent promptly.

So at DOE we face an enormous challenge: the Recovery Act asks us to manage more money than we've ever had, on tight timetables, giving money to more entities than ever before.

To meet this challenge, Secretary Chu brought in a team of highly-qualified managers and energy experts. The leader of these efforts is Matt Rogers, the Secretary's Senior Advisor for Recovery Act Implementation. Matt comes to DOE from McKinsey and Company, where he was a senior partner with more than 20 years of experience in the energy industry. He is also, quite simply, one of the most talented and dedicated public servants I've ever known. He and his team have worked tirelessly to lead the Department in spending DOE's \$37 billion in Recovery Act funds with speed, transparency and accountability.

In making these historic investments, DOE has had several substantive goals:

1. Dramatically improve energy efficiency, saving Americans billions of dollars

Under the Recovery Act, we are making the largest single investment in home energy efficiency in U.S history. For low-income families that are hit hardest by high utility bills, the Recovery Act provides \$5 billion for the Weatherization Assistance Program, which funds local agencies to perform home energy audits and weatherization services. As a result of the Recovery Act, we expect to weatherize about half a million homes for low-income families by the end of next year, improving energy efficiency and cutting energy costs.

Over the next several years, our investments will help millions more Americans cut utility bills by making their homes and appliances more energy-efficient. The Recovery Act expands tax credits for energy efficiency upgrades to cover 30 percent of costs up to \$1,500.

The Recovery Act also includes \$3.1 billion for DOE's State Energy Program, showcasing cooperation between federal and state agencies. Historically, the State Energy Program and its partners save more than \$7 in energy costs and leverage non-federal investments of over \$10 for every dollar of federal investment.

The Recovery Act also funded for the first time \$3.2 billion in Energy Efficiency and Conservation Block Grants, which will assist cities, counties, states, territories and Indian tribes to develop their own efficiency programs, including: building code development, energy audits and retrofits, efficient public lighting and landfill gas capture.

As part of the Block Grant program, we've launched an innovative effort called "Retrofit Ramp Up" that will award up to \$390 million for innovative programs to provide whole-neighborhood building energy retrofits. These projects will demonstrate a sustainable business model for providing cost-effective energy upgrades for a large percentage of the buildings in a given community.

2. Build the strongest renewable energy industry in the world

Recovery Act investments totaling \$23 billion will put us on track to *doubling* both renewable energy generation and advanced energy manufacturing by 2012, while leveraging over \$43 billion in additional investment. We expect these investments will create hundreds of thousands of jobs.

We are funding across the range of renewable energy technologies in the power mix, including wind, solar, geothermal, hydro and efficiency. We're also investing in the research, development and deployment of renewable energy. As just one example, up to \$24 million in Recovery Act funding has gone to three universities around the country to improve land-based and offshore wind turbine performance and reliability. I was recently in Maine, where experts told me that offshore wind resources could provide enough electric power for the entire state in the decades ahead. At the same time, the Recovery Act has so far provided more than \$2 billion in Section 1603 grants-in-lieu of tax credits (where energy producers receive cash upfront instead of waiting for tax credits), helping these companies access the capital they need to deploy renewable energy now.

By the end of this year, we'll have supported more than 15 GW of new wind, solar and geothermal – enough to power 4 to 5 million homes. Our domestic renewable energy industry has made clear that the Recovery Act has been crucial to unlocking financing for these kinds of projects in recent months.

DOE has also worked closely with the Treasury Department on the Section 48(c) tax credit for clean energy manufacturing. The President announced last month that 183 manufacturers in 43 states would receive \$2.3 billion in tax credits. The interest was extraordinary and the program was oversubscribed by a ratio of more than 3 to 1. The Administration has called on Congress to provide an additional \$5 billion to expand the program. Because there is already a deep pipeline of projects, these funds will be deployed quickly to create jobs and support economic activity.

3. Transform the transportation sector

We're investing approximately \$4 billion in Recovery Act funding to develop the next generation of vehicles, plus \$8.5 billion so far from our Advanced Technology Vehicle Manufacturing loan program. These projects will transform the transportation sector, supporting electric and natural gas vehicles, advanced biofuels and projects that will improve the efficiency of internal combustion engines.

Over the next six years, three new electric vehicle plants – the first ever in the United States – and 30 new battery and other electric-vehicle manufacturing plants will be fully operational. We've made investments in battery and component suppliers like A123, Enerdel and Cellgard, as well as manufacturers like Nissan, Tesla, Fisker and Ford to make advanced vehicles in the United States. These plants will have capacity to produce 250,000 electric-drive cars and batteries to power 500,000 plug-in hybrid electric vehicles. We are also building the infrastructure to support these vehicles, including more than 10,000 charging locations in a dozen cities.

We've awarded \$300 million in Recovery Act grants to 25 Clean City coalitions of public and private fleets. These grants significantly expand city- and county-led efforts to reduce petroleum consumption and deploy high-efficiency cars, trucks and buses that run on alternative fuels. The 25 projects support over 9,000 alternative-fuel vehicles, 70 percent of which will run on natural gas, mainly for heavy-duty trucks.

At the same time, Recovery Act investments will support the development and deployment of the next generation of biofuels. Over \$600 million in Recovery Act grants along with federal loan guarantees will support 19 pilot, demonstration, and commercial-scale bio-refineries. These facilities will convert biomass into fuels and chemicals that otherwise would be produced from oil, while creating jobs and raising farm incomes in rural communities across the country. Before these investments, the development of an advanced biofuels industry was at a virtual standstill as numerous facilities at the pilot stage had faltered during the economic downturn.

More than \$100 million from the Recovery Act, plus an additional \$87 million, will go to improving the efficiency of heavy-duty trucks and passenger vehicles. With private sector cost-sharing, this will support nearly \$375 million in total investment, creating over 6,000 jobs by 2015.

Also, Recovery Act grants totaling \$8 billion will spur the development of America's first nationwide program of high-speed intercity passenger rail service. The awards will go toward developing 13 new, large-scale high-speed rail corridors across the country. The Department of Transportation – not DOE – is in the lead on these investments.

4. Build a 21st-century power infrastructure

Our electrical grid is a critical piece of infrastructure, but today it uses century-old technology. It wastes too much energy, it costs us too much money, and it's too susceptible to outages and blackouts.

Just as President Eisenhower's investment in an interstate highway system revolutionized the way Americans travel, our Recovery Act investments in the smart grid and new transmission lines will revolutionize how we produce, transport and use energy.

The more than \$4 billion in Recovery Act smart grid investments will be matched by more than \$5.5 billion in private sector funding for nearly 140 projects that will reduce costs, increase reliability and give consumers more choice and control over their energy use. By 2015, we expect a combination of public and private investment to lead to the deployment of 18 million smart meters nationally (more than double the number currently in service). The Recovery Act is also funding the installation of nearly 1,000 sensors on the electric transmission system to improve reliability and security, for the first time covering the entire U.S. transmission system. We expect these smart grid investments to create tens of thousands of jobs.

5. Demonstrate carbon capture and sequestration (CCS) can be economical in 8-10 years

With \$3.4 billion from the Recovery Act along with funds from other programs, we are making unprecedented investments in CCS, attracting roughly \$7 billion in private capital. Projects we are supporting are projected to capture 12 million tons of CO₂ annually by 2015 and much more in the years beyond. Realizing the promise of low-carbon electricity from coal requires an economical solution to capturing CO₂. The leading processes today are amine and ammonia-based processes that cost \$60 per ton and have a very significant energy penalty, which has prevented them from reaching widespread commercial implementation. New CO₂ capture technologies, using different solvents, adsorbents and absorbents, hold the promise to significantly reduce the energy penalty, cut capital costs and reduce the cost per ton by more than half. Our innovative grants are funding entirely new approaches such as synthetic enzymes or conversion of CO₂ into valuable fuels or chemicals, that could reduce the cost even more.

6. Re-establish U.S. leadership in science and technology

The Recovery Act is accelerating the pace of technical innovation in the energy sector, which can serve as the basis for sustained future economic growth. We are restoring U.S. leadership in science and technology so we can lead the global competition in clean technology.

For instance, the Recovery Act included \$400 million for the Advanced Research Projects Agency – Energy (ARPA-E), modeled after the Defense Department’s famed DARPA. DARPA is widely credited for inventing, among other things, the Internet. ARPA-E will fund high-risk, high-reward energy technology research – as Secretary Chu says, in baseball ARPA-E is like “swinging from the heels.” Not every project will succeed, but those that do have the potential to radically transform our energy system.

Game-changing research funded through ARPA-E so far includes:

- grid-scale liquid metal batteries that could cut battery costs by 90% while doubling energy density;
- direct solar fuels – photosynthetic organisms that produce hydrocarbons instead of carbohydrates, combining CO₂, sun and water to produce ultra-clean gasoline; and
- super-high-efficiency small wind turbines, leveraging advanced aerospace designs and materials to reduce the cost, improve the reliability and expand the range of wind energy.

The projects we have funded under the Recovery Act – and the many projects we have not been able to fund – highlight the opportunity for the United States to accelerate clean energy innovation and take a global leadership position in clean energy industries globally.

And, as I mentioned before, DOE also has the important role of managing our nuclear arsenal, and cleaning up sites across the country associated with the legacy of our nation’s nuclear weapons program. DOE’s Office of Environmental Management oversees more than 80 active sites across the country, 17 of which received \$6 billion in Recovery Act funding to accelerate ongoing cleanup work. These “shovel-ready” projects have created or saved more than 12,000 jobs to date, helping to get local economies moving again while eliminating Cold War-era contamination.

So to sum it all up, how have we been doing overall?

To date, DOE has selected \$31 billion and obligated \$25.5 billion of our \$36.7 billion in appropriations. We’ve also underwritten \$4.6 billion in clean energy tax credits and grants-in-lieu of tax credits, and identified more than \$1 billion in projects that will be financed through loans and borrowing authority. These selected funds have been matched by over \$27 billion in private capital, supporting around \$65 billion in projects.

As we move into 2010, we’re focused on delivering on the President’s objectives for the year. Our goal is to reach 100 percent selection and obligation by September 30. We’re also working with recipients to get projects started and accelerate hiring. We expect that the first half of 2010 will be a period of increased clean energy job creation, adding to the more than 60,000 clean energy jobs already created or saved thanks to the Recovery Act.

And what *more* must be done?

The Recovery Act is a down payment, but it alone is not sufficient to drive the kinds of investment we’ll need to reach our goals. To transition into a clean energy economy, we must create a system of incentives to make clean energy the profitable kind of energy. That means putting a price on carbon pollution through comprehensive energy and climate legislation. With such legislation, we’ll establish clear targets and stable rules that will allow American industry to confidently scale up clean-energy infrastructure and remain competitive in the 21st century. There is real common ground on comprehensive energy and climate legislation. We must overcome differences and pass such legislation, for ourselves, our children and our grandchildren.

We must work to build on the Recovery Act, seizing opportunities under highly successful and over-subscribed programs such as the tax credit for clean energy manufacturing.

The American Recovery and Reinvestment Act has helped teach a lesson: when times get tough, government is often part of the solution. Today, millions of Americans are in jobs made possible by public servants in Washington who worked tirelessly to shape the Recovery Act and make it effective. Millions of Americans are in jobs made possible by public servants in state governments who worked in partnership with federal officials to restore hope for families across the nation. Governors across the political spectrum have joined in public events to celebrate the arrival of Recovery Act funds in their states.

This is part of a great American tradition. When our nation faced 25 percent unemployment in the Great Depression, the federal government stepped in to stabilize the financial system, establish the Social Security system and create millions of new jobs. When our nation was fighting the Second World War, the federal government led efforts to re-tool our factories, summon us to a great cause and defeat ruthless dictators on two continents. When our soldiers returned home triumphant, the federal government paid for their education under the GI Bill, giving a generation of Americans a chance for a better life. It was the federal government that built the interstate highways on which so many of us depend, the federal government that provides health security to our nation's seniors with Medicare and the federal government that conducted the research that led to the creation of the Internet. Every day, Americans enjoy these and many other benefits of work done by their federal government.

Americans like Wendy Van Zandbergen, a single mom from Durant, Oklahoma, who lost her job as a home healthcare manager when the job market went sour. She sold her house, exhausted her savings and emptied her retirement plan to stay afloat. Thanks to the Recovery Act, Wendy is now an energy education trainer in her community.

Americans like Dom Rosas, who served for seven years in the U.S. Army, including a tour in Iraq. Back in civilian life, he landed a job making pizzas, but hoped for more. Thanks to the Recovery Act, last year he received training in home weatherization programs and now has a steady, long-term position in Southern Colorado.

Americans like Tim Rosandick, superintendent of the Homedale School District in Idaho. Thanks the Recovery Act program to make schools more energy efficient, he says, the district

will now save more than \$13,000 each year. The Idaho state government estimates that school upgrades will create more than 250 jobs statewide in the next three years.

And Americans like Dave Vieau, President of A123Systems, a battery manufacturer that started as a spinoff from MIT's labs in 2001 with the help of a \$100,000 DOE Small Business Innovation Research grant. Since then, the company has raised over \$350 million in private capital. Today, A123 is using a \$249 million Recovery Act grant to build factories in Romulus and Brownstown, Michigan. Thanks to the Recovery Act, A123's first large-scale battery plant will be built in this country, creating jobs here, in some of the hardest-hit communities in the United States.

The American Recovery and Reinvestment Act helped kick-start a sputtering economy and is making investments that will matter for years to come. But even the historic investments under the Recovery Act will not be enough. They are just a down-payment. The most powerful engine of innovation and job growth in our country is the private sector. In the months and years ahead, our success will depend upon both our willingness to use the federal government wisely to help all Americans, as we have so often throughout our history, and upon the entrepreneurial zeal and innovative spirit of the American people.