

A photograph of a wind turbine under construction against a clear blue sky. A yellow crane is positioned on top of the tower, and a red bucket is suspended from it. The turbine's nacelle and blades are visible. The text is overlaid on the right side of the image.

**THE NEW**  
**APOLLO**  
**PROGRAM**  
**Clean Energy, Good Jobs**

***AN ECONOMIC  
STRATEGY  
FOR AMERICAN  
PROSPERITY***



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*Affiliations listed for identification purposes only.*

### President:

**Jerome Ringo**

**Apollo Alliance**

330 Townsend St.

Suite 205

### Co-Directors:

**Cathy Calfo**

San Francisco, CA 94107

**Kate Gordon**

415-371-1700

## September 2008

On the cover: The Trent Wind Farm under construction in Salt Flat, Texas, the largest wind producing state in America.

Opposite page: Nevada Solar One, opened last year, became the first new thermal solar electricity plant to be built in the U.S. in more than 17 years.

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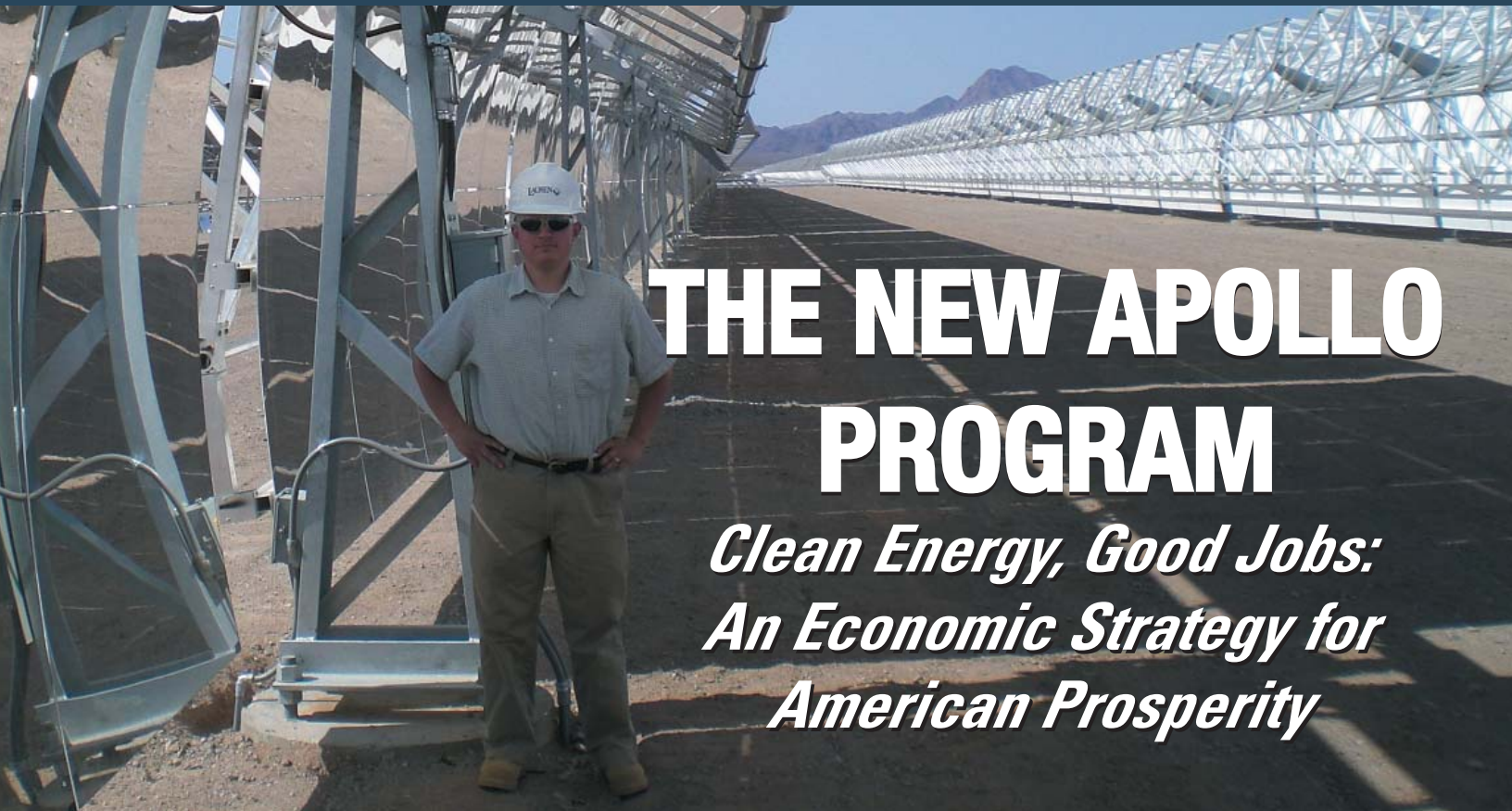
For more information on  
The New Apollo Program visit:

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# THE NEW APOLLO PROGRAM

*Clean Energy, Good Jobs:  
An Economic Strategy for  
American Prosperity*

Courtesy of AnSCO Machine Company

**T**he *New Apollo Program* is a comprehensive economic investment strategy to build America's 21st century clean energy economy and dramatically cut energy bills for families and businesses. It will generate and invest \$500 billion over the next ten years and create more than five million high quality green-collar jobs. It will accelerate the development of the nation's vast clean energy resources and move us toward energy security, climate stability, and economic prosperity. And it will transform America into the global leader of the new green economy.

For Americans, this is a time of daunting challenges and boundless opportunities. We have become ever more dependent on foreign oil, putting our national security and economic future at risk. We have seen the price of gas and energy skyrocket as American families struggle to make ends meet. We have seen the growing threat of global warming and all its economic, environmental and human costs. And we watched that threat become a reality as Hurricane Katrina pounded our shores, providing a stark reminder that America faces not only a climate crisis, but a crisis of economic inequality as well.

At this historic moment, Americans face a choice. Do we continue with business as usual, putting our planet, our security, and our economic well-being at risk? Or do we seize the opportunity to forge a new path — building a new clean energy economy that creates

good jobs and broadly shared prosperity for our future?

For the Apollo Alliance, a national coalition of labor, business, community, and environmental leaders, the choice is clear. We must move forward.

Time and again in our history, periods of great risk have prompted America to mobilize its wealth, skills, leadership, natural resources, and entrepreneurial spirit to overcome the challenges confronting us. Time and again, we have emerged from crisis better and stronger.

The World War II industrial mobilization made America the world's dominant power, producing half its economic output. The National Interstate Highway System, designed to make America less vulnerable to attacks on its cities, became an economic and social web connecting people, communities, and metropolitan centers. And it was the Apollo space program that gave

the nation the advances in computer sciences and digital communication that drove this country's economic expansion for decades to come.

We did it before. We can do it again.

*The New Apollo Program* will set the nation on a new path to prosperity. Its five key initiatives will reduce pollution, increase efficiency, promote research and development, provide good jobs, and expand opportunity for all.

*The New Apollo Program* will:

### **REBUILD AMERICA CLEAN AND GREEN.**

America must generate cleaner power and use the power we have more efficiently — especially in the residential, commercial, industrial, and technology sectors that make up nearly 70 percent of our current energy use. We call for a range of solutions, including an Energy Smart Fund to upgrade the energy efficiency of all buildings by at least 30 percent by 2025; consistent long-term public support for clean energy projects in order to produce 25 percent of the nation's power from renewable sources by 2025; new environmentally sound transmission corridors and “smart grids” to bring new clean power to market; efficiency measures for existing utility and industrial power systems including mass recycling of waste heat; investments in carbon capture and storage (CCS) deployment projects; and affordable and convenient transit to connect America's 21st century neighborhoods and cities.

**MAKE IT IN AMERICA.** Retooling the nation's energy systems will require a new and improved manufacturing sector to produce durable equipment like advanced heating and cooling systems, biofuel refinery boilers, next-generation cars and trucks, efficient transmission lines, wind towers and turbines, and solar panels. To capture the low-carbon markets of the future and lower the carbon footprint of our manufacturing sector, we call for new grants to retool and retrofit America's factories and retrain

skilled workers. So that we never again rely on other nations for our energy security, and so that we do not dramatically increase carbon emissions by importing parts, these grants will be directed to companies that use American-made components and parts, assemble systems in America, and put Americans to work.

### **RESTORE AMERICA'S TECHNOLOGICAL LEADERSHIP.**

The new clean energy economy will be built on innovation. The rich scientific and technical resources of American universities, private-sector inventors, and national laboratories have been responsible for significant breakthroughs in building efficiency, solar panels, wind turbines, carbon sequestration, and other clean energy and environmental technologies. Yet funding for basic energy research and development has not kept up. We call for an aggressive energy innovation agenda to double the annual federal investment in energy research and development, and to create a National Energy Innovation Fund to take the most promising new technologies to commercial scale.

### **TAP THE PRODUCTIVITY OF THE AMERICAN PEOPLE.**

America must scale up its workforce to meet the demands of the clean energy economy. We call for expanded investment in state and local green-collar worker training initiatives, higher education scholarships, and union apprenticeship programs that focus on preparing workers for everything from low skill, entry-level jobs that help Americans climb the ladder of opportunity all the way up to high-skill, high-wage jobs at the leading edge of technical innovation. Resources will be dedicated to creating green pathways out of poverty for low-income job seekers so they may better access green-collar job career ladders; at the same time, we must invest in an effort to graduate significantly more engineers and natural science majors from our universities. Finally, we call for a clean energy service program that allows Americans from all walks of life to serve their country by

working for clean energy independence.

**REINVEST IN AMERICA.** Building a new energy economy requires a new way of doing business in America, one that takes the cost of global warming into account. It also requires visionary new investments in our industries, our communities, and our workers. To generate and strategically reinvest the hundreds of billions of dollars necessary to build the new clean energy economy, the next president and Congress must enact a cap and invest mechanism to reduce carbon emissions, trade the allowances, and invest proceeds directly back into energy efficiency, renewable power, transit and transportation, and green workforce initiatives. We recommend the creation of a new Clean Energy Investment Corporation to invest these funds, to ensure accountability in spending public dollars, and to help hard hit communities and families make the transition to the new energy economy.

This is a bold agenda, meant to move America toward a sustainable and vibrant future. But it is not unprecedented. What we propose to invest — \$50 billion per year — is a smaller share of our gross domestic product than what we spent on the original Apollo program. It is one-third the amount that we spend each year in Iraq. Surely, our energy security challenges are serious enough to warrant this level of national commitment.

*The New Apollo Program* can and must be financed without loading debt on future generations. We know that it will generate billions of dollars in savings each year through greater efficiency in buildings, industrial facilities, power plants, and the power grid. Yet, to make the promise of fiscal responsibility real, we must commit ourselves to redesigning federal programs — for transportation, housing, workforce training, and agriculture — to support progress towards America's clean energy, good jobs future. We must eliminate wasteful expenditures, like unneeded and unwarranted

subsidies to the oil industry. And we must pass a carbon emission cap and invest program — expected to generate \$50 billion to \$300 billion per year — to strategically reinvest in the new clean energy economy.

As we move together toward the clean energy future, we must ensure that a core set of American values and standards are embedded in the new energy economy. We must ensure that all Americans have a chance to participate in the clean energy transition, and that the new clean energy economy creates broadly shared prosperity.

To do this, we must:

**Ensure equal opportunity** by providing pathways out of poverty and into green-collar career tracks for underserved Americans.

**Provide a level playing field** for energy-intensive industries so carbon regulation does not inadvertently drive jobs and pollution offshore to countries with weaker environmental and labor standards.

**Ensure regional equity** for the parts of America most dependent on extracting and using fossil fuels and therefore most likely to suffer worker, community, and industrial dislocations in a new energy economy.

**Respect the dignity of work** by ensuring that we maintain America's long held commitment to prevailing wage standards and strong labor protections whenever federal dollars are invested in the new energy economy.

In the spirit of the American frontier, the future we envision is one not of limited horizons, but of expanding possibilities. The solutions we propose will not only curb global warming and make our country and the world more secure, they also will create vast new industries, unimaginable new business opportunities, and millions of good jobs.

**To accomplish these goals, here is what we must do:**





## 1. Rebuild America Clean and Green

### ***Establish a national energy efficiency commitment to reduce energy use in new and existing buildings at least 30 percent by 2025.***

Residential and commercial buildings are responsible for 40 percent of all U.S. energy consumption. Add in the industrial and technology sectors, and the number spikes up to almost 70 percent. That is the challenge. But here is the opportunity: By 2035, fully three-quarters of U.S. buildings will be either new or substantially renovated. Energy efficiency pays for itself quickly with energy savings while creating high quality, permanent jobs for skilled workers such as laborers, electricians, sheetmetal workers, engineers, and architects. Ten billion dollars of investment into efficiency upgrades and retrofits would create more than 100,000 on-site jobs and hundreds of thousands more indirect jobs in the local economy. Coupling efficiency retrofits with renewable energy, such as solar and geothermal systems, creates even more direct jobs in manufacturing and installation while pumping clean power back into the grid.

Expanding public and private investment in energy efficiency and distributed power is the cheapest, fastest way to reduce rising energy costs, curb greenhouse gas emissions, and create a new generation of high quality green-collar jobs. We need to move our building sector into the clean energy future by adopting aggressive efficiency standards for new and existing buildings, and by providing resources to homeowners and the public and private sectors to

meet and exceed these standards.

In the past two decades there has been almost no improvement in the standard model energy code, the International Energy Conservation Code (IECC). We must update the IECC by requiring a variety of off-the-shelf, affordable improvements such as efficient lighting and improved insulation that would boost efficiency in new homes by 30 percent. Combining these improvements with smart growth strategies, sustainable building design, and on-site renewable power installations could get new buildings down to a near-zero carbon footprint. At the same time we must ensure that all federal building and housing programs meet or exceed the highest standards of efficiency.

For our existing building stock, we must establish an Energy Smart Fund that would make grants to state or local entities such as utilities, states, municipalities, or public-private partnerships to provide one-stop energy efficiency, green building, and renewable energy services and financing to homeowners, businesses, industrial firms, and public entities such as school districts. The Energy Smart Fund should target a significant amount of its resources to assist low-income homeowners and renters to reduce their energy bills through retrofitting buildings and replacing old, inefficient appliances. The bulk of the program's financing should be targeted at large-scale (e.g. neighborhood-wide or multi-building) energy efficiency projects focused on the combined goals of reducing energy costs and providing career ladders into the construction and building trades.

Many states and cities already have implemented aggressive energy efficiency goals. The Energy Smart Fund should supplement, not supplant, existing state and local programs and should lift up the best examples of state and local action. For example, priority should be given to states that already have adopted rate decoupling, which separates utility profits from sales volume and thus makes energy conservation as



# Big Wind Lessons From a Little Missouri Town

***Rock Port first in U.S. to generate all its power with wind***

Eric Chamberlain, a fifth generation native of Rock Port, Missouri who works in his family's funeral business, was driving in a procession in Iowa in 2001 when he saw his first wind farm. Fascinated, he pulled over.

The utility-scale turbines he encountered were new to Chamberlain — so massive they could provide electricity not just to a single farm but to whole cities.

In April 2008 when the Loess Hills Wind Farm officially switched on, what started as Chamberlain's dream became reality. The tiny town of Rock Port, with barely 1,300 residents, became the first community in the nation capable of meeting all of its energy needs through wind power. The turbines, linked to the city-owned utility, were installed by St. Louis-based Wind Capital Group, with financing from Deere & Co., the world's biggest manufacturer of farm equipment.

The town and project planners expect Loess Hills' four 1.25 megawatt (MW) Suzlon turbines to produce about 16 million kilowatt hours each year, three million more than Rock Port uses each year, or 123 percent of the town's needs. Rock Port's electricity meter actually runs backwards.

Since 2006 when Chamberlain began working part-time with Wind Capital, the company grew from four employees to 30. Chamberlain now works full-time as the manager for wind farm operations. His wife has taken over most of the funeral home's day-to-day business, though every so often he still drives the hearse.

**Eric Chamberlain led the project to build four windmills to serve all of Rock Port's electrical needs, the first time that has happened in the U.S.** Lend Frison for the Apollo Alliance



## “Allentown” To Boomtown

Spanish wind technology giant Gamesa opened its first North American plant in Pennsylvania three years ago. Gamesa USA

### ***Pennsylvania’s Clean Energy Revitalization***

The latter decades of the 20th century in Pennsylvania were marked by locks and chains at factory gates as plant after plant closed. Billy Joel memorialized the era in his 1982 pop hit “Allentown.”

Now, thanks to forward-thinking policies from Governor Ed Rendell that link clean energy development to jobs, Spanish wind technology giant Gamesa decided to locate its first North American plant in Pennsylvania.

According to company spokesman Michael Peck, the company has invested \$175 million and created 1,160 union jobs in the state since January 2005, when ground was broken for its facility in the picturesque Allegheny Mountain community of Edensburg, 74 miles east of Pittsburgh.

In addition to the Edensburg plant, Gamesa chose Philadelphia for its U.S. headquarters and built another manufacturing plant in Fairless Hills, northeast of Philadelphia on the site of a shuttered United States Steel Company factory.

Gamesa’s decision to base itself in Pennsylvania didn’t just happen. It took the efforts of a number of players ranging from state and local government, workforce development groups, and organized labor.

Key to the entire deal was Pennsylvania’s passage in 2004 of an aggressive measure requiring 18 percent of the state’s electricity to come from renewable sources by 2021.

Secondly, workforce groups created a detailed database of the skills available from dislocated steel workers, which they presented to Gamesa to prove the region could staff its plants.

In fall 2006, the United Steelworkers of America (USW) informed Gamesa that a majority of employees at both facilities had signed pledge cards. Their first contract was ratified in June 2007 and included agreements on raises, bonuses, and benefits with a provision that a skill-based incentive program be introduced. USW is a founding member of the Apollo Alliance.

“This first-of-its-kind labor agreement proves that we can grow our economy, create skilled positions for our hardworking people, and improve the quality of our environment,” said Kathleen A. McGinty, former secretary of the state Department of Environmental Protection, and a member of the Apollo Alliance board of directors.

financially attractive to utilities as new energy production, and that have secured agreements from utilities to deliver energy efficiency services.

State or local grantees should be free to experiment with a variety of mechanisms to reduce well-known market barriers to energy efficiency. In allocating funds, we propose that the federal Energy Smart Fund targets projects that simultaneously promote clean energy and good jobs by using certified auditors and installers; showing a commitment to long-term education and training for energy efficient operations and maintenance; providing opportunities for low-income and displaced workers to get on-the-job experience; and providing formal connections to union apprenticeship programs. Funds also should be targeted to projects financed through energy service contracts or other mechanisms that allow building owners to pay nothing up front, and instead repay retrofit costs through energy savings.

### ***Provide the support necessary to produce 25 percent of the nation’s power from renewable and recycled energy resources by 2025.***

America’s renewable energy industry has suffered badly from stop-and-go public incentives. This inconsistency has contributed to foreign competitors eclipsing American companies in the manufacture, sale, and installation of clean energy technologies, many of which were first developed in American laboratories.

Renewable electricity is by definition “made in America.” In contrast all the conventional fuels — including coal, oil, and natural gas — are global commodities subject to sharp price increases in line with rising global demand. In the global economy renewable power equals economic and energy security. Given the importance of renewable power to America’s clean energy future, it is time to level the playing field and provide a more predictable return on investment to the renewable power sector.

A few pennies-per-kilowatt-hour of public support is all that is required to make renewable power competitive with fossil fuel. In fact, the cost of generating electricity from wind is already competitive with generating power from new coal-fired power plants. And renewable energy creates more jobs than coal: the same investment creates



50 percent more jobs in wind and in solar than in coal.

To stabilize the market for renewable energy production, Congress must approve a 10-year extension of the Production Tax Credit (PTC) and the Investment Tax Credit (ITC), and dedicate some portion of the proceeds from carbon allowances in any future cap and trade legislation to help finance renewable power production.

**■ *Bring our power grid into the 21st century.*** The power grid is outmoded, overloaded, and unsuited to the needs of America's clean energy future. We currently lose six percent to nine percent of all the power that enters the grid, costing the U.S. economy nearly \$20 billion annually. Congestion and blackouts cost consumers another \$79 billion a year. The U.S. must improve the grid and increase access, while protecting our environment and natural resources. Otherwise we will continue to bleed valuable energy and dollars, and we will lose our chance to reach the vast stores of renewable energy needed to move America to a clean energy future.

The federal and state governments should work closely together to establish new transmission corridors that take into account renewable energy resources, access to population centers, environmental considerations, and community concerns. These corridors must be developed with the input of all affected stakeholders, must comply with all environmental laws, and should be permitted on an expedited and coordinated basis.

In addition to new transmission lines, America needs to update its existing electrical power grid. The nation is overdue for a modernized grid, one that easily incorporates large and small power generators and multiple types of renewable power supply. The modern grid must also be "smarter," allowing for communication between consumers (or their appliances) and power generators in order to manage power demand efficiently during peak

hours. Bringing our power grid into the 21st century will not only make our nation more efficient and secure, it will also greatly facilitate the widespread deployment of renewable energy and electric vehicles, and will preserve and create hundreds of thousands of high quality jobs for utility workers.

Improvements to the grid must be accompanied by major investments in smart grid demonstration projects. Funds should be directed at projects incorporating the best available technology to make the grid as efficient, secure, environmentally friendly, and accessible as possible. Like the Internet, the power grid must be able to connect billions of devices and still operate reliably. Because of growing environmental concerns, the grid needs to become far more flexible than it is today, accommodating distributed power generation from renewable sources and making effective use of the latest energy efficiency techniques.

**■ *Improve efficiency by 20 percent in existing power plants and industries by 2025.*** Our energy

systems will not be transformed overnight. Utilities and industrial power users will need to rely on existing power sources, including coal and natural gas, for years to come. But these systems must be made more efficient if we hope to achieve greenhouse gas reductions on the scale necessary to stabilize the climate.

We must encourage utilities and industrial power users to upgrade their power generation systems by incorporating combined heat and power systems, with the goal of achieving 20 percent improvement in industrial and utility efficiency by 2025. Combined heat and power (CHP) uses waste heat from power plants and industrial facilities to produce electricity and thermal energy that normally is cheaper than the energy otherwise purchased. A variety of industrial waste streams can be recycled into useful heat and power, as can many industrial processes, such as catalytic crackers at petroleum

refineries and blast furnaces at steel mills. Conventional power plants also can be converted so their waste heat is captured and used for heating homes and businesses close to the plant. All together, existing untapped CHP resources could generate up to 492,000 gigawatts of carbon-free power — as well as thousands of new green-collar jobs building, installing, and maintaining CHP systems.

To encourage CHP systems at industrial sites and utilities, we must put in place an investment tax credit for eligible systems — large and small — that produce at least 20 percent of their energy in the form of thermal energy, and that are at least 60 percent energy efficient. To encourage utilities to incorporate CHP into their electricity generation mix, Congress should require states to adopt standard interconnection policies that allow easy and consistent access to the power grid.

We also recommend targeted investments to demonstrate and deploy capture and sequestration (CCS) technology at integrated gasification combined-cycle (IGCC) plants, or other coal-fired power plants that are capable of achieving a high degree of CO<sub>2</sub> capture. Currently providing half of the nation's electricity, coal is likely to remain an important source of energy for the foreseeable future. Around the world, many industrial and emerging economies depend heavily on coal to meet growing power demand. The U.S. has the opportunity to invent tools and practices to reduce atmospheric emissions from carbon combustion, and then to export this technology to other coal-dependent nations.

Once carbon prices reach \$35 per ton under a future carbon cap, power companies should find it commercially viable to retrofit existing plants to capture their carbon emissions. They will not do so, however, unless the technological feasibility of CCS has already been demonstrated at commercial scale. Congress should invest in demonstration and deployment of carbon capture and storage technology at a minimum of ten coal-fired power

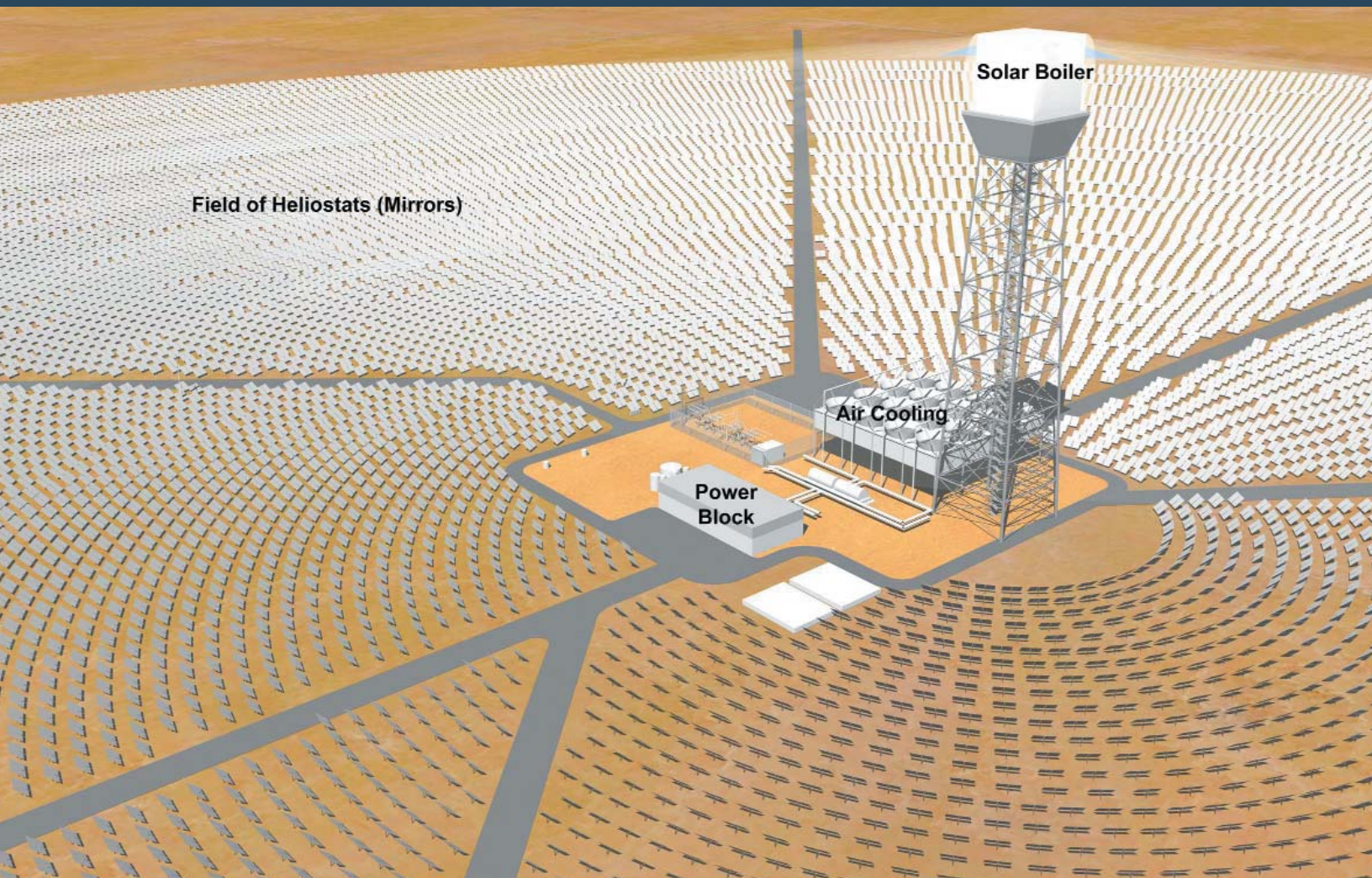
plants. We also recommend that the government map potential geological storage formations in all 50 states using a rigorous methodology, and develop clear regulations to ensure that waste CO<sub>2</sub> is injected safely.

■ ***Connect America's 21st century neighborhoods and cities with world-class transit systems.*** Nearly 30 percent of all greenhouse gas emissions come from the transportation sector. At the same time, more than half of U.S. households lack ready access to public transportation, which would take them off congested streets and highways. America needs to make a major commitment to build walkable, transit-oriented communities and to expand transit options both within and between cities, including light rail, improved and more efficient bus service, bicycle lanes and services, and inter-city and regional rail, all linked together so it is easy and affordable to ride transit.

Good access to transit can put dollars back into the family budget. Transportation is the second largest cost (19 percent) of the American household budget, but this number drops to 9 percent or lower in areas near transit hubs. In 2000, American families spent, on average, \$1,400 on gasoline. By 2007, that number had risen to over \$3,000 per year, and it is on track to go above \$4,000 in 2008. A lack of transportation choices also seriously harms American economic productivity. From 1982 to 2005, the annual cost of the extra time and fuel wasted in congestion rose from \$15 billion to \$78 billion in 2005 dollars. People who commuted during peak periods in 2005 lost 38 hours on average — essentially a work week — sitting in traffic.

Unless national leaders take action to increase transportation options, these trends will continue. Since 1980, the number of miles Americans drive has grown three times faster than the U.S. population, and almost twice as fast as vehicle registrations. If this continues, vehicle miles traveled will increase by nearly 60





BrightSource's Ivanpah plant will use hundreds of mirrors to focus the sun's rays onto a boiler atop a central tower. BrightSource Energy

# California Solar Plant Generates Clean Power and Good Jobs

## *"Great example of the new green economy"*

A parcel of desert 200 miles northeast of Los Angeles is scheduled to be the site of the first new solar electric generating station in California in 20 years. The new Ivanpah Solar Power Complex, to be built by Oakland-based BrightSource Energy, will consist of three plants with a total output of 400 megawatts (MW).

BrightSource's Ivanpah plant will use hundreds of mirrors, known as heliostats, to track the desert sun, focusing the sun's rays onto a boiler sitting atop a central tower. The boiler makes steam, which in turn powers a turbine to produce electricity. The plant is expected to create 950 union jobs in construction, 90 jobs in operation, and will supply enough electricity to power more than 250,000 homes.

Bob Balgenorth, president of the State Building and Construction Trades Council of California, called the new plant "a

great example of the new green economy - good union jobs building renewable generation plants."

BrightSource is composed of the same management team that built California's nine existing solar plants, which profitably produce 350 MW of electricity. BrightSource is counting on more consistent market signals. Americans say they support investment in renewable energy sources and action to curb global warming. California is a good market because it requires that 20 percent of its electricity is produced from renewable sources by 2010.

In April, BrightSource signed a power-purchase agreement with Pacific Gas and Electric. In May they raised \$115 million in capital from a group of investors, which included Google and BP Alternative Energy. The company wants to break ground in 2009 and have the first 100 MW online in 2011.



percent from 2005 to 2030. These increases will wipe out any emissions reductions from the improved fuel economy standards enacted into law in 2007.

Transit programs don't just reduce carbon emissions, they also create jobs. Transit projects tend to generate nine percent more jobs per dollar spent than road and bridge repair and maintenance projects, and nearly 19 percent more jobs than new road or bridge projects.

America must take two critical steps to drive the rapid expansion of transit nationwide. First, Congress should aggressively support transit expansion and maintenance through the federal transportation bill. Currently there is not enough money allocated to transit to fund the proposed projects that our metro regions need to expand their transportation options. The next transportation bill should tip the balance toward transit by prioritizing those regional transportation plans that support transit-oriented development, access to transit for low-income and working families, and low-impact transportation options like regional bikeways.

Second, Congress should dedicate significant funds to a new "Transit Trust Fund." The Transit Trust Fund should supplement funding provided through the transportation bill on the condition that the transportation bill's funding allocation for transit only increases and is not diminished relative to other modes of transportation.

**Strengthen and improve America's transportation infrastructure by "fixing it first."**

Roads and bridges are the backbone of our metro areas and our interstate economy — and they are falling apart. The National Surface Transportation Policy and Revenue Study Commission found that America needs to invest at least \$225 billion annually for the next 50 years to upgrade our existing system to a state of good repair and create a more advanced surface transportation system to sustain and ensure

economic competitiveness. We are spending less than 40 percent of this amount today.

We must make maintenance of existing highways, bridges, and roads the highest priority in American roadway construction policy. A "fix-it-first" policy, incorporated into the transportation bill and all other transportation funding measures, will promote more efficient land use patterns by fixing existing infrastructure before investing in new highways. As such, it will encourage in-fill development — discouraging sprawl, reducing fuel consumption and emissions, and improving traffic flow. It will also create enormous numbers of high quality jobs. Every \$1 billion spent on federally-aided highway resurfacing projects creates some 10,421 person-years of construction jobs (as compared to 9,316 person-years of work for a similar investment in new highway construction). Finally, resurfacing projects offer the opportunity to change the way we build roads and to incorporate new types of concrete and asphalt that can better absorb water, helping to reduce stormwater runoff and flooding across America.

## 2. Make It In America



**Rebuild the U.S. auto industry by investing in high-efficiency vehicles.**

The new vehicle fuel efficiency standards adopted in 2007 have raised the bar for the U.S. auto industry. We recommend that Congress help the industry exceed those standards by retooling older plants, and by helping consumers purchase a broad range of next-generation vehicles including alternative fuel cars, hybrids and plug-in hybrids.

These investments in the long-term future



Sharp employs about 190 members of the International Brotherhood of Electrical Workers at its Memphis photovoltaic panel plant.  
IBEW for the Apollo Alliance

## Memphis Solar Plant Serves Hot National Market

### *Sharp depends on skilled workers*

When most people think of Memphis the first things that usually come to mind are Elvis, barbecue, and the blues. However, in the not-too-distant future solar energy might also be on that list.

Sharp Electronics, the second largest manufacturer of photovoltaic solar cells in the world, converted part of its Memphis plant to solar panel production in 2003, its first panel manufacturing facility outside of Japan.

Each year the Memphis Sharp plant produces enough panels to create about 64 megawatts of potential power, enough to power 14,000 homes. Global sales of photovoltaic equipment are expected to near \$20 billion in 2008, and are increasing 25 percent annually.

Sharp employs about 190 members of the International Brotherhood of Electrical Workers (IBEW). Growing consumer and commercial demand for photovoltaics makes the U.S. market worth targeting. Memphis' central location along the Mississippi River, and links to other transportation routes, means that Sharp can easily serve both coasts.

"Manufacturing is growing again in the United States. We're finally bringing jobs here," said Kenneth Ingram, business manager at IBEW Local 474, and a former chief steward at the plant. In the past 20 years 119,000 IBEW members have lost their jobs nationally, but Ingram and others are convinced that new clean energy technologies and green industries can reverse that trend.





As the Duluth port's trade in wind energy components picked up, more workers were put on the ground, earning more than \$30 an hour.  
Kenneth Newhams/Duluth Shipping News

## Clean Energy Trade Lifts Great Lakes Port

### *Duluth's port workers thrive with wind*

Look no further than Duluth, Minnesota to see how clean energy can generate wealth for local economies while providing real jobs that pay real wages. The Duluth Seaway Port Authority generated record profits of \$2.3 million for fiscal 2007, nearly three times the previous best of \$837,000 in 2001.

Wind power turned out to be one of the crucial factors. "This is just a booming business," said Ron Johnson, the port's trade development director.

Business started to bloom in 2004 when the port began handling its first components from Vestas, the Danish wind turbine manufacturer, which shipped parts for projects in the Midwest.

Since then the port has won contracts with 10 other wind technology companies, including seven turbine manufacturers, two tower fabricators, and the world's largest blade manufacturer. What was once a one-way trade from Europe to the U.S. is now two-way. General Electric and other American

companies are gaining a larger share of the world's rapidly expanding wind energy industry, now valued at more than \$20 billion annually.

Johnson estimates at least 2,000 people depend on the port for their jobs, including dockworkers, merchant marines, stevedores, crane operators, warehousing staff, and maintenance and tugboat crews. As the port's business picked up, more crews and more workers were put on the ground, earning more than \$30 an hour.

The port, located at almost the exact geographic center of the North American continent, is well positioned for serving the Midwest's wind sector. The Duluth port also has earned a reputation among the major wind component manufacturers for its skilled and largely union workforce. "We use the people who do it right and who stand behind their work," said Johnson. "The productivity of our workers is phenomenal."



of the U.S. auto industry will help to ensure the domestic production of next-generation vehicles and create or retain hundreds of thousands of U.S. jobs. Retooling older auto plants will help revitalize struggling manufacturing communities, make the best use of our existing skilled manufacturing workforce, and avoid wasteful duplication of transportation lines and supply chains. Congress should consider a variety of funding mechanisms for retooling, including tying existing tax credits and new loan guarantees and grants to concrete, enforceable commitments on fuel efficiency, domestic content, and creation or retention of good jobs.

At the same time Congress should provide assistance to consumers — in the form of rebates or other incentives — to encourage the purchase of fuel-efficient and flex-fuel vehicles. This will allow consumers to hold down their gas bills while helping the country curb its addiction to oil.

**Invest in a national low-carbon fuel infrastructure and next-generation alternative fuels.** Today, 96 percent of the energy for American cars and trucks comes from oil. The cost of our oil addiction is becoming more evident every day as gas and diesel prices spiral upward. We must expand consumers' fuel options. To that end, we must dramatically expand the number of filling stations that carry and sell cellulosic ethanol, sustainably-produced biodiesel, and other low-carbon fuels. We recommend that Congress extend and increase the tax credit given to fueling stations for installing E85 pumps and tanks, and allow the credit to be used for biodiesel pumps and tanks as well. These tax credits should be phased out over time.

In a clean energy economy powered by renewable and efficient sources, electricity can also be an important low-carbon fuel. Widespread use of plug-in electric vehicles will reduce America's dependence on oil and the greenhouse



Mayor Cory Booker teamed up with the Apollo Alliance to create a roadmap for a healthy sustainable city. Seth Sherman/Trust for Public Land

## Newark's Green Future

### Mayor Cory Booker and Apollo pursue new vision

The Apollo Alliance is teaming up with the leaders and residents of Newark to turn New Jersey's largest city into a national showcase for smart energy solutions, clean development, and green-collar jobs.

The Green Future Summit in September 2008 unites Newark's business, environmental, labor, and community leaders around a single goal: Writing a roadmap for a healthy sustainable city with economic opportunities for all citizens.

The project, unveiled last year in New York at the Clinton Global Initiative, included a pledge signed by the Apollo Alliance and Newark Mayor Cory A. Booker. The plan commits to three major goals: Renewing green spaces to ensure children have access to safe recreation areas, ensuring that all new development is as energy efficient and sustainable as possible, and providing real economic opportunity for residents.

"This wouldn't be possible without all the great work people are already doing in Newark and certainly not without all the great work the mayor's office has been doing," said Jack Dafoe, Apollo Alliance's coordinator for the Newark project.

Newark, located on the Passaic River and once a premier industrial center, went through a period of steady decline after WWII. Businesses and residents increasingly fled for the suburbs and 1967 riots rocked the city, with racial tensions boiling over between the city's urban poor and the police department. As many as one-quarter of Newark's residents live below the poverty line.

Mayor Booker was elected in 2006 and has pledged to forge a cleaner healthier future for the city. Today, the city's rental housing market is on the rise. The city has broken ground on a new nine-acre park. The park, designed with input from area residents and school children, is a sign, said Booker, that Newark is set to "become a national leader in safety, prosperity, and the nurturing of family life."

gas emissions associated with burning fossil fuels. Throughout *The New Apollo Program* we advocate investing in the infrastructure necessary to bring these vehicles to market in a significant way. This infrastructure includes investment in American auto plants that are retooling to produce electric vehicles; consumer support for purchasing these vehicles; major improvements to the transmission grid, which is effectively the pumping station for electric vehicles; and advances in battery technology that will allow wind and solar energy to be stored and used on demand.

We also must look forward to developing the next generation of efficient, sustainable, renewable fuels. A shift to home grown, advanced biofuels could slash the country's oil trade deficit (\$29.3 billion in April 2008 alone, and rising), create competition and lower prices at the fuel pump, and reduce carbon emissions from our cars and trucks. Cellulosic ethanol, a biofuel derived from non-food perennial crops like switchgrass, and advanced biodiesel, a renewable fuel for diesel engines produced from sustainable sources of fats and oils such as algae and waste materials, have the potential to replace 9 billion gallons of transportation fuels by 2025 and upwards of 100 billion gallons — nearly one-third the total projected U.S. gasoline demand — by 2050.

The renewable fuels sector is a major source of green-collar jobs. Conservative projections of future growth by the U.S. Department of Energy estimate that every 10 billion gallons of ethanol produced in the United States will generate 100,000 to 200,000 jobs. Cellulosic ethanol is even more labor intensive because it requires the additional step of separating cellulose from sugars.

We recommend that Congress fully fund incentives for the first 250 million gallons of cellulosic ethanol or biodiesel produced each year from sustainable alternative feedstock through 2013, as established in the 2005 energy bill. We further recommend investing in the

building and operations phases of commercial-scale cellulosic ethanol and sustainable biodiesel plants, in order to move this technology forward to a point where it can seriously compete with petroleum and corn-based ethanol. Although there are several advanced biodiesel and cellulosic ethanol plants in operation today, investors have balked at funding full-scale plants until the market viability of this type of fuel is proven.

In all cases, financing should be directed toward facilities that produce fuels with lifecycle greenhouse gas (GHG) emissions at least 50 percent lower than traditional petroleum-based fuels, including emissions associated with any direct or indirect changes in land use. It is critical that the impact of biofuel production on arable land be as minimal as possible. Extra weight should also be given to facilities that are farmer- or cooperatively-owned, where feasible, as these provide greater local economic benefits than do absentee-owned facilities.

### *Restore America's manufacturing leadership to meet the demands of the clean energy future.*

The U.S. has lost more than 7.2 million manufacturing jobs since 1998 due to mergers, bankruptcies, outsourcing, automation, and globalization. These are some of the country's best middle-class jobs, paying an average of \$25,000 more per year than service sector jobs and often providing good benefits as well. Manufacturing is also a better engine of economic development than the service sector, because every dollar invested in manufacturing generates wider "multiplier effects" through finance, transportation, supply chains, installers and other businesses.

U.S. manufacturers have tremendous potential to supply the growing domestic and international demand for the gears, bearings, composite materials, concrete, steel, glass, copper, computers, motors, and other

# Waves Of Clean Energy Production

## *Technology delivers wave park*

Oregon, which harnesses a huge amount of its electricity from hydroelectric power, is jumping from rivers to the coast. Plans to build a wave park - a system of enormous buoys which capture energy from the rise and fall of ocean waves and convert it into electricity for use in homes and businesses - is underway off the coast near the town of Reedsport.

With one test buoy already deployed, the project is an example of how a state can leverage its resources to produce clean energy and at the same time pump new economic promise and new jobs into established industries.

Planning for the wave park began in 2006 when Oregon Solutions, a non-profit created under the state's Sustainability Act of 2001, drew together state and local politicians, area residents, fishermen, and Ocean Power Technology, a company specializing in offshore wave technology.

"This is a perfect example of how public policy and investment can lead a large group of stakeholders into a collaboration that means clean energy and good, quality jobs for the state's workers," said Barbara Byrd, the secretary-treasurer of the Oregon AFL-CIO, and leader of Oregon State Apollo.

The 64-year-old Clackamas company building the buoys, Oregon Iron Works, used its skilled workforce, with vast expertise in both metal fabrication and harsh marine environments, to build state-of-the-art energy generating buoys. The company employs about 400 people, about half of whom are represented by Ironworkers Local 516. Each buoy takes 10 to 20 people to build. With one prototype complete and more on order for this project, Chandra Brown, the company's vice president, said she can see a day when they could employ hundreds more.

"Green technology is part of our long-term future. U.S. manufacturing is alive and well and should be taking advantage of this opportunity," she said.

Oregon Iron Works



**Oregon is leveraging its labor, technological, and natural resources to produce clean energy from wave power and at the same time pump new economic promise into established industries.**

components and durable equipment required to make the current economy more efficient and to build the emerging clean energy economy. The domestic market for solar panels, wind turbines, fuel cells, and biomass engines alone is projected to reach \$226 billion annually by 2016. An aggressive program to promote domestic manufacturing of renewable energy products could help create or retain 85,000 permanent green-collar jobs on the factory floor — not to mention hundreds of thousands more indirect jobs in the local economy — and benefit up to 70,000 U.S. firms capable of making the required components, mostly located in the 20 states hardest hit by manufacturing job losses.

The federal government should work with state Manufacturing Extension Partnerships to encourage manufacturers to retool and expand existing plants, and to locate new plants in the

U.S. by offering awards that provide up to 30 percent of the costs to build or retool a facility or train workers for domestic clean energy or energy efficiency-related manufacturing. Awards could come through a combination of existing tax incentives and credits, new grants, loans and guarantees, and seed capital. Manufacturers and training institutions with direct relationships to manufacturers would be eligible. These awards would be available to foreign-owned firms so long as those firms maintain manufacturing operations in the U.S. for at least five years. Awards for retooling and training activities would be based on a set of preferences to ensure the maximum use of domestically-sourced parts, the best use of idled manufacturing facilities and skilled manufacturing workers, the best connections to existing union apprenticeship programs, a solid market for finished products, and





# Grass Gas Makes Sense

*Michigan lab in race to  
break down cellulose*

“The beauty of switchgrass is how hearty it is and how fast it grows,” said Dr. Suleiman Bughrara of Michigan State University. “One acre can yield 12 or 13 tons of grass. That can produce 500 gallons of ethanol.”

Gary Howe for the Apollo Alliance

Amid rows of corn and soybeans, the two field crops that for decades dominated agricultural research and farming as it’s done in the Middle West, stands a tiny plot of tall switchgrass at Michigan State University’s crop and soil science farm in East Lansing.

Suleiman Bughrara, an assistant professor and plant breeder at MSU, sowed the grass two years ago. Though fermenting the starch from corn into ethanol is the favored and disputed conversion of the moment, Dr. Bughrara says it is much more efficient to turn the sugars in cellulose, the basic structural material of fast-growing grasses, into ethanol. There are 161 ethanol plants in 23 states, 78 more plants than in 2002, according to the Renewable Fuels Association. All but a handful convert corn to ethanol.

“The beauty of switchgrass is how hearty it is and how fast it grows,” said Dr. Bughrara. “One acre can yield 12 or 13 tons of grass. That can produce 500 gallons of ethanol.”

Last December, Congress amended the national Renewable Fuel Standard and set a goal of producing 36 billion gallons of renewable fuel in the United States by 2022. Corn will be the base for less than half of the ethanol. The single largest source – 16 billion gallons – will come from cellulosic ethanol.

Scientists and industrialists contend that the promise of cellulosic ethanol is enormous. It could make a huge difference in reducing America’s imports of foreign oil, which are draining nearly \$60 billion a month from the economy. Producing cellulosic ethanol on marginal land and in regional biorefineries will employ thousands of farmers and tens of thousands of plant workers in American-made, green-collar jobs. And greenhouse emissions from cellulosic ethanol are 85 percent lower than burning gasoline, according to the Department of Energy’s National Renewable Energy Laboratory in Colorado.

above-average pay and benefits.

To ensure the clean energy future brings energy security and climate stability, grants made under this program should only go to projects using 85 percent American-made component parts, and doing final assembly in America.

### 3. Restore America's Technological Leadership



#### ***Double national investment in clean energy research and development.***

The rich scientific and technical resources of American universities, private-sector inventors, and national laboratories have been responsible for significant breakthroughs in building efficiency, solar panels, wind turbines, carbon sequestration, and other clean energy and environmental technologies. Yet funding for basic energy research and development has not kept up.

Public investment in energy-related R&D fell from \$7.8 billion per year (in today's dollars) in 1979 to less than \$4 billion today. Public dollars beget private dollars. For instance, in the medical and biotechnology field, a doubling of federal investment during the 1990's was accompanied by an 11-fold increase in private sector investment. The decline in public investment in clean energy brought a corresponding decline in private capital. From 1993 to 2005, private sector energy R&D investments fell 50 percent. In fact, from 1988 to 2003, the U.S. energy industry invested just one-quarter of one percent of revenues in R&D, compared with pharmaceuticals, software, and computer companies, which invest up to 15 percent of revenues in R&D. New energy-related patents — an indicator of the rate of innovation — have declined parallel with the decline in R&D

investing for such critical technologies as wind and solar photovoltaics. Though private investment has gone up in the last few years, it is still short of where it needs to be.

Given that future economic growth in an innovation-based economy depends on the continuous introduction of new technologies, the falloff in public and private R&D investment bodes poorly for the long-term health of America's clean energy sector.

If we are serious about America's competitiveness in the global clean energy market, we must double the current level of investment in clean energy R&D. Clean energy research and development should accomplish three goals: improve existing technology, develop cost-competitive energy storage for renewable generation, and develop novel and revolutionary technologies, such as would be accomplished by the Advanced Research Projects Agency-Energy.

We call on Congress to focus on the following priorities for investment: advanced energy storage systems for improved grid management; smart grid technologies to reduce peak energy demand; nanotechnology and advanced materials science for new solar cells and ultra-light wind-turbines; the widespread introduction of plug-in hybrid vehicles; and advanced cellulosic ethanol and sustainable biodiesel production. To ensure that public R&D spending yields commercially viable products, Congress should encourage more public-private partnerships — including with small businesses — and federal-state partnerships, provided that private partners commit to bringing the most promising inventions to market in the U.S.

#### ***Establish a National Energy Innovation Fund to invest in the most promising new clean energy technologies emerging from our nation's laboratories.***



While research and development lays the foundation for a competitive economy, the nation's economic success requires taking the most promising laboratory prototypes and demonstrating them at commercial scale. Commercial demonstration of unproven new technologies is often seen as too risky by the private sector. The result has been a proverbial "Valley of Death," where promising technologies die for lack of adequate venture capital.

Too often, lack of consistent federal support has created the opportunity for foreign competitors to step in, achieving commercial success with technologies developed in America's laboratories. Solar photovoltaic technology, wind turbines, and compact fluorescent light bulbs are among the many advanced energy technologies that were invented in American laboratories with public dollars, but largely commercialized abroad. The American economy is losing the competitive advantage that comes from deploying these advanced technologies.


The imperative for effective commercialization strategies has only grown more urgent with the pace of technological change. Advances in digital design and materials science mean that today's advanced technology could be out of date in four or five years. Current solar photovoltaic technology could, for instance, eventually be eclipsed in some applications by nano-solar or thin film alternatives. The pace of change requires an aggressive national policy to move new technologies quickly from the laboratory to the market.

America must take the lead in funding demonstration projects in cutting-edge clean energy technologies. An independently managed National Energy Innovation Fund would partner with existing federal and state programs, our national and university laboratories, and the private sector. The fund would be capitalized using federal dollars for ten years, and then

would roll returns on investments into future operations and further investments. Funds could be leveraged through creative financing tools, such as loan guarantees or partnerships with state and local government or the private sector.

Demonstration financing should flow to technologies of obvious strategic benefit to the nation's energy, climate, and national security goals. Among the technologies that should be given attention are investments in smart grid, cellulosic and sustainable biodiesel, and carbon capture and sequestration (CCS) demonstration projects — each of which is described in more detail in other parts of *The New Apollo Program*.

## 4. Tap the Productivity of The American People



### *Train America's workers for the new clean energy economy.*

The recommendations we have outlined above will spur massive new demand for clean energy and energy efficiency systems, and will provide millions of high quality, family supporting, green-collar jobs. But, given that nearly 40 percent of the nation's skilled workers are slated to retire in the next five to ten years, and that America has fallen from second place to twentieth in the world in training engineers and natural scientists, we must also invest in educating and training workers to fill those jobs.

Scaling up to meet the demands of the clean energy economy will require investments in worker training at every level of the green-collar career ladder — from entry-level jobs, to middle-skill jobs traditionally considered blue-collar, up to high skilled, high wage professional jobs. America must reinvest in its workforce by:

- Dramatically expanding the Energy Efficiency and Renewable Energy Workforce Training Program (the "Green Jobs Act")

enacted in the 2007 energy bill, which provides grants for national and state training programs to prepare skilled workers for the full range of jobs and emerging technologies in the clean energy economy. Eligible training entities would include partnerships involving industry, labor unions, vocational schools, community colleges, and community organizations.

- Dedicating significant funding to create green pathways out of poverty training programs — based in high schools, vocational schools, junior colleges, prison reentry programs, and worker training centers — to give low-income workers the basic job readiness skills they need to enter and successfully complete workforce training programs like those described above.

- Awarding 100,000 Clean Energy Tomorrow scholarships each year to students pursuing undergraduate degrees in science, math, or engineering to provide America with the homegrown talent to build the new clean energy economy.

Finally, Congress should double federal support for national service programs, with the goal of expanding service opportunities in clean energy and energy efficiency. Americans understand the imperative of moving to clean energy technologies and of combating global warming, and they overwhelmingly support national service. A clean energy service program would expand national service opportunities — including AmeriCorps, Senior Corps, and Learn and Serve America — and put Americans of all ages to work to build the new energy future.

### ***Ensure the transition to America's clean energy economy creates widely shared economic opportunities.***

With the proper foundation, the clean energy economy can lift all boats and provide a solid foundation for our country's environmental and financial future. But just as in every major economic transformation, some communities will suffer dislocations in the short term.

We must ensure the economic opportunities of the clean energy future accrue to communities that have suffered from heavy job losses, especially those



## **Green Jobs Corps Graduates First Class**

Menyui Leung, member of the first graduating class of Oakland's green-collar training program, quickly landed a job installing solar panels in the San Francisco Bay Area. Lou Dematteis for the Apollo Alliance

### ***Oakland develops family-supporting clean energy jobs***

It was a Thursday in June 2008 when the first 18 students graduated from one of Oakland's first green-collar jobs training programs. The next day, one graduate already had a new job.

Menyui Leung, 34, started her new position in construction management and customer service at SunPower, a San Jose-based company making photovoltaic systems.

"I hope the rest of my classmates will do as well out of the program as I have," said Leung. "I really believe that in the green jobs industry education is paramount."

Leung, who has worked as a welder, was looking for a new career when she first heard about the green jobs training program through California's Education Development Department (EDD) and was attracted to the combination of hands-on and theoretical experience the program promised.

The program awards graduates with a state-approved environmental engineering technician's certificate. It is the first program of its kind in Oakland, which has an unemployment rate of 8.9 percent, one of the highest in the nation. The Regional Technical Training Center (RTTC) in Oakland, a nonprofit workforce development organization, designed the curriculum specifically to help disadvantaged workers take advantage of the growing green economy.

RTTC is an active member of the Oakland Apollo Alliance and the program was largely inspired by the work of Apollo and the Ella Baker Center for Human Rights, which anchors Oakland Apollo, along with the International Brotherhood of Electrical Workers (IBEW) Local 595.

"Oakland needs more of these programs that connect people who need jobs with some of the most exciting and important jobs in the region," said Ian Kim, director of the Green-Collar Jobs Campaign for the Ella Baker Center.



who are adversely affected by changes in national energy policy. Accordingly, Congress should provide transition assistance for those communities, families, and workers most affected in the coming economic transformation. This assistance should include retirement bridges, wage replacement and financial support during worker training and education programs, and investment in local economic development.

At the same time, Congress should provide targeted assistance to low-income consumers disproportionately affected by higher energy costs. This funding should be administered in the way that will best reach the largest number of low-income households — for instance, through the state Electronic Benefit Transfer systems that currently deliver food stamps and other benefits.



## 5. Reinvest In America

***Establish a federal “cap and invest” program to generate and strategically reinvest the resources necessary to build the new clean***

***energy economy.*** *The New Apollo Program* is a bold agenda for our new energy future. At one time, Americans understood that great public undertakings required serious public investments. We spent the equivalent of \$70 billion per year (measured as a share of GNP) on the original Apollo moon landing program and we did it without borrowing from our grandchildren. Surely, our energy security challenges are serious enough to warrant an even greater level of national commitment.

To generate the funds necessary to make this commitment, the next president and Congress should enact a “cap and invest” policy

that accomplishes three goals. First, it must set limits on carbon emissions and dramatically lower our national carbon footprint. Second, it must provide a powerful market stimulus to shift our entire energy economy toward low-carbon technologies. Third, it must raise significant levels of public funding to reinvest in the new energy future, while ensuring these funds are not siphoned off for wasteful pork-barrel projects.

A cap on carbon emissions would send a powerful market signal to move toward low-carbon energy sources, and would establish certainty in the rate of emission reductions necessary to stabilize the earth’s climate. Emission reductions would be achieved by reducing the number of carbon permits sold or allocated to the market each year. Trading these permits would allow the market to achieve carbon reductions at the lowest cost. Moreover, a cap and invest system, where emission permits are auctioned off to energy-intensive industries and power producers, would generate substantial public funding — anywhere from \$50 billion to \$300 billion per year — for investment in the new clean energy economy.

We recommend the creation of a new Clean Energy Investment Corporation to invest these funds, to ensure accountability in spending public dollars, and to help hard hit families and communities make the transition to the new energy economy.

**A strong cap and invest system must:**

1. Ensure an adjustment period for carbon-intensive industries, and the workers and communities that these industries support.
2. Invest in rapid deployment of low-carbon energy technologies to move the clean energy economy forward and hold down energy costs.
3. Provide fair treatment for energy-intensive industries so that any rise in energy prices does not create pressure to move operations offshore to countries without carbon controls. This could come in the form of a global agreement among large emitters to reduce

carbon emissions worldwide, thereby preserving a level playing field for American industry. In the event that this agreement cannot be reached in a timely fashion, however, Congress should authorize a border adjustment mechanism to level the playing field for American industry. A level playing field makes environmental as well as economic sense; we'll make little headway on global warming if tight standards here simply displace industry — and pollution — to countries with lax standards.

4. Ensure that the human health benefits of a cap and invest policy are broadly shared across society. Though cap and invest legislation will generally result in significant reductions not only in carbon but also in other harmful pollutants (such as mercury and particulates), there are some high-polluting power plants that may continue operating even in the face of high carbon costs. Other complementary policies should therefore be included in the cap and invest legislation, such as incentives or requirements to dramatically reduce pollution from old power plants, and to help ensure these facilities do not operate indefinitely. For example, Congress should consider giving utilities incentives to purchase low-carbon technologies in exchange for more stringent restrictions on their highest polluting power plants.

Enactment of a cap and invest system is fundamental to achieve the scale of change necessary to build a new energy economy.

## Conclusion

*The New Apollo Program* provides a blueprint for the new economy — an economy built on clean, renewable energy and high quality, green-collar jobs. It is an ambitious program; America is up to the challenge. As the newly elected president and Congress take office, Americans have an extraordinary opportunity to embrace bold action and take charge of our destiny. *The New Apollo Program* can launch our nation to a more prosperous, secure future.

Let's get started.

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*“The Obama plan borrows heavily from a concept developed by the Apollo Alliance, a San Francisco-based coalition of labor, environmentalist, business, and social justice leaders. The four-year-old alliance is seeking to reframe the global warming debate to focus on the economic opportunities of going green.”*

Bloomberg.com, May 2008

*“Some say a real solution lies in the government embarking on a massive effort to fund renewable energy - something akin to the Apollo program that put a man on the moon in the 1960s.”*

CNNmoney.com, June 2008

*“Phil Angelides and his allies want to cast a wider net. A green-collar job can be anything that helps put America on the path to a cleaner, more energy efficient future.”*

Time Magazine, May 2008

*“Jerome Ringo, president of the Apollo Alliance, predicted that the nation could generate three million to five million more green jobs over the next 10 years.”*

The New York Times, March 2008

*“The Apollo Alliance teamed up with leaders in Los Angeles to retrofit hundreds of city buildings. The Los Angeles initiative is saving the city up to \$10 million in energy costs per year while at the same time establishing a Green Career Ladder Training Program to connect low-income residents to jobs.”*

Business Week, February 2008