



green TECHNOLOGY

strategy and leadership for clean and sustainable communities



CALIFORNIA'S NEW ENERGY ECONOMY

Developing the Workforce
to Fuel its Growth

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Trade-Technical College



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Publisher
Keith Miller

Editor in Chief
Carl Smith

Managing Editor
Racquel Palmese

Associate Editor
Bob Graves

Contributors
Barbara Crane
Tristan Volpe

Creative Director
Gerardo Perez



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Green Means Jobs in House Bill

Holding the line against global climate change and other environmental challenges means developing new non-polluting products, technologies and industries. With those will come a host of new jobs. The Green Jobs Act funds new training efforts as well as apprenticeships, community college and local skills centers programs and “Pathways out of Poverty” projects.

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For too long, low-income communities and people of color have been hit first and worst by toxic pollution and ecological disasters, while benefitting last and least from new economic growth. Van Jones, co-founder and president of the Ella Baker Center for Human Rights, sees “green collar jobs” as a way out of poverty and the new green economy as a way into a new era of clean energy and economic growth.

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Residents of low income communities are often caught in a dangerously closed loop, with substandard education leading to limited job options to more poverty. The Ella Baker Center for Human Rights, working with the Apollo Alliance, is leading the way in promoting access to good jobs in the emerging green economy.

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With California in the midst of an unprecedented quest for clean energy, Brian Hurd, a vocational instructor at the East Los Angeles Skills Center (ELASC), realized that demand for photovoltaic installers was set to explode. To ensure that all of his students could have a chance to enter the solar industry, Hurd developed a course of study that would prepare them.



Green Technology is an initiative of the non-profit Foundation for Advancements in Science and Education (FASE). Established in 1981 as a coalition of researchers, physicians, scientists, environmentalists and other professionals, FASE produces a broad range of public interest communications and research. The foundation’s environmental health programs have encompassed research, reporting, conferences and policy. FASE has also produced more than 70 educational programs for public broadcasting, many addressing environmental issues. These productions have received more than 150 awards, including three Peabody awards and the Environmental Media Award. Drawing upon this rich and unique organizational experience, Green Technology provides a forum that advances government and private sector efforts to create clean and sustainable communities.

Green Technology
4801 Wilshire Blvd., Suite 215
Los Angeles, CA 90010
323.936.7125
www.green-technology.org



Timothy A. Simon

CURBING GLOBAL WARMING BY UNLEASHING STUDENT ENERGY

by Timothy A. Simon
Commissioner, California Public Utilities Commission

The possibility that human activities could change Earth's climate, with disastrous social and economic consequences, has emerged as the greatest challenge of this new century.

Under the leadership of Governor Schwarzenegger, California is setting the pace for our nation's response to this challenge.

Unlike those who suggest that serious attempts to reduce greenhouse gas emissions will hurt the economy, the Governor sees a new "Gold Rush" for the state – an unprecedented

opportunity to build a vital new economy based on products and services that can meet the needs of society without endangering its future.

Our investment community agrees, and its visionaries have declared that "green technology" – from clean, renewable energy to new approaches to the design of our homes, offices and communities – will power the 21st century's economy.

It is likely that the majority of those whose help we need to accomplish this transformation

are unaware of the events unfolding around them – or their tremendous potential to make a difference in the lives of millions. These individuals are the students in California's schools, the essential building blocks of our new "green workforce."

Rarely in our history has it been more important for our schools to operate, and to educate, with real awareness of society's needs. We are in a transitional period that will end with an economy, a workplace and a culture that are very different from what has come before.

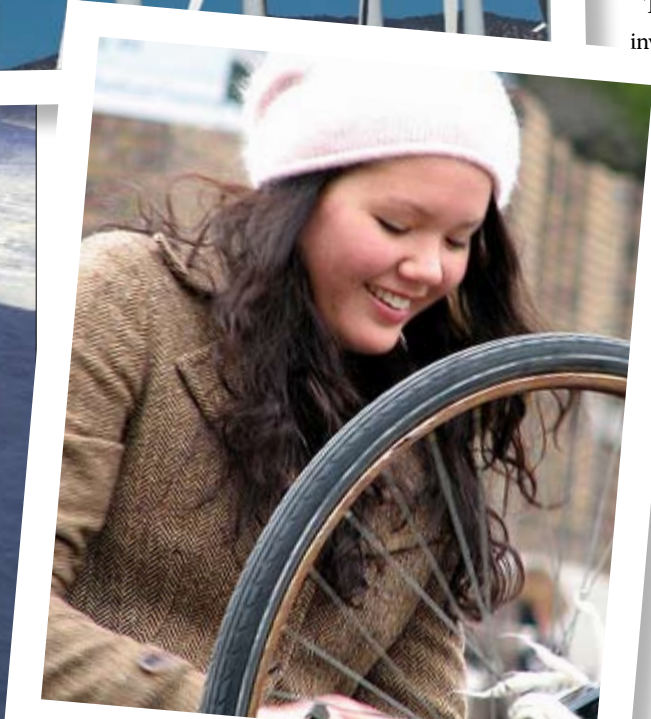


Photo Flickr Annemie Hiele

Students in California schools are the building blocks for sustainable industries that can transform the future.

and preparing them for careers that allow them to greatly improve their own quality of life – while improving conditions for society at large – is profoundly sustainable.

As an important step in this direction, on January 14, 2008, I will be spearheading a conference in conjunction with the Willie L. Brown Jr. Institute on Politics and Public Service titled “Advancing the New Energy Economy in California.”

This conference will bring together investors, political leaders, educa-

tors, industry experts, and labor leaders to advance long-term investment, financial growth and job creation within the green technology sector. Key figures will articulate the challenges and solution strategies for diversified, continuous expansion of green business and technology in California.

This conference is not intended to be a one-day event, but rather the beginning of a dialogue to bridge the gap between the investor community and the green economy workforce to ensure that all communities can benefit from these new economic development opportunities.

This dialogue must also include those in the educational community, from students and teachers to administrators. The talent and experience that exists in this sector is essential to a successful evolution of our economy.

We have the power to create an educational surge that can match the United States’ response to Sputnik. I urge you to become involved in this work, and I look forward to working with *Green Technology* to engage educators in it. We have the means to ensure that our state – and our planet – can remain productive and welcoming for future generations. ❁

If we manage the transition well, the differences will be positive. Cleaner air, healthier, more productive workplaces, improved transportation systems, and communities that satisfy basic human needs as much as they do the needs of commerce.

A haphazard, half-hearted approach could lead to a much different kind of future, one in which the flaws and injustices of our current culture are magnified and increasing numbers of men and women find themselves without access to essential resources.

It is our responsibility to ensure that this transition is productive and creative; that it provides increasing numbers of Californians with work that is financially and environmentally rewarding. This is the scenario the Governor proposes, and I strongly support his vision.

The range of needs is great, and it is important that the diversity of opportunity is shared among California’s diverse community of students. Social equity is one of the cornerstones of sustainability. Lifting up larger and larger numbers of students who are currently at risk,

FROM RESEARCH TO MARKET 'GREEN' ENTREPRENEURS ACADEMY

by Tristan Volpe

The road from the lab to the marketplace can be long and treacherous, so much so that it is commonly referred to as the “valley of death.” But an innovative program at UC Davis offers assistance on this road to researchers and inventors working to conserve energy and other natural resources.

The Green Technology Entrepreneurship Academy, taking place July 7 to 11, 2008 at Lake Tahoe, California, and hosted by the UC Davis Center for Entrepreneurship, is at the forefront of an accelerating effort by universities to transform research into businesses that solve real-world problems.

“With the growing global environmental crisis, the need for practical solutions to energy and resource conservation has become a major issue,” said Andrew Hargadon, director of the entrepreneurship center and the UC Davis Energy Efficiency Center. “The challenge lies in translating environmentally sustainable technologies and research into viable business ventures.”

Professor Hargadon says the workshop - like all of the center’s programs - responds to his students’ desire to see their work have tangible impact. “Many scientists would like to see their research change the way we produce or consume energy; the way we treat our wastewater; or the way we monitor, diagnose, and treat toxins in our bodies and our environment. But broader impact depends on

both sound science and a viable business model. We provide the tools for putting those two together and, once that happens, real and sustainable change can follow.”

Last year, the academy brought together more than 40 participants - doctoral students, business students and professors from universities across the country - to work under the guidance of UC Davis faculty, technology transfer experts, entrepreneurs and investors from environmental science and technology-based ventures.

UC Davis MBA student Josaphine Tuchel teamed with campus colleague Yi

Zhu, a Ph.D. candidate in biological and agricultural engineering, on a business plan for an energy-efficient infrared dehydration system for fruits and vegetables. Tuchel said the Green Technology Entrepreneurship Academy took the project to a whole new level.

“There’s a great deal of value that’s added by bringing the two groups—researchers and business people—together,” Tuchel said. “When thinking about where to go next, the two types of people have different questions. You get a broader view of the situation. There are more angles.” Beyond fine-tuning her project,

Prof. Andrew Hargadon, UC Davis Graduate School of Management, welcomes participants to the inaugural Green Technology Entrepreneurship Academy in Incline Village, Nevada, 2007.





The Green Technology Entrepreneurship Academy participants 2007

Tuchel said she enjoyed the opportunity to listen and learn about others' business ideas. "It wasn't passive," she said. "I got to ask the questions that would help them develop their idea better and gained new insight for myself."

Chris Grandlic, a graduate student in the Department of Soil, Water and Environmental Science at the University of Arizona, said he'll look back at the academy as a revelation. "Before this experience, I had a hard time imagining how to begin transferring technology into the field or market," he said. "But now I have a list of 45 contacts that are like mentors and who I can contact for advice. Thanks to the entrepreneurship academy, I have a network and a place to start."

A handful of the teams piqued investors' interest in providing potential seed funding. Hargadon said the success of the 2007 academy sparked the sponsors to support two future five-day programs on green technology. "Entrepreneurial researchers want the experience and training—and there's a growing market demand for the technology."

As a consequence, the 2008 program aims to replicate a highly successful and pragmatic learning environment. Participants will bring a diverse range of projects to the academy, including those that could produce environmentally friendly packaging, improve inventory methods for forestlands, significantly reduce electricity usage for air conditioning and eliminate the use of drinking water for evaporative cooling.

The program will integrate lectures, exercises, team projects and informal fire-side chats. Tracks will focus on clean energy; clean air, water and soil; sustainable agriculture; remediation; and sustainable materials. Hargadon said students will learn to manage the dynamics of entrepreneurship, evaluate technology and market opportunities, pursue patent and licensing strategies, write business plans, manage interdisciplinary teams and find funding.

The five-day intensive academy is modeled after the UC Davis Graduate School of Management's yearlong and weeklong

programs in which doctoral science students develop skills to commercialize research.

Hargadon, an associate professor in the management school and its director of technology studies, oversees the academy. A former design engineer for IDEO Product Development and Apple, he studies innovation and new product development. He is author of *How Breakthroughs Happen: The Surprising Truth About How Companies Innovate* (Harvard Business School Press 2003). The academy will be held at the Tahoe Center for Environmental Sciences in Incline Village, Nevada. A \$24 million green building that houses research and teaching

programs, the facility is a collaboration of UC Davis and three other educational institutions.

The UC Davis Center for Entrepreneurship is a Center of Excellence at the Graduate School of Management and serves as a nexus for entrepreneurship education and research and as a springboard for entrepreneurial initiatives, private equity and venture capital activities on the UC Davis campus.

Academy sponsors for 2008 include the Ewing Marion Kauffman Foundation, the Nevada Institute for Renewable Energy Commercialization (NIREC), the National Institute of Environmental Health Services, PG&E, Sierra Angels and the UC Davis John Muir Institute of the Environment.

For additional information, visit the academy's Web site at: <http://www.gsm.ucdavis.edu> The UC Davis Center for Entrepreneurship and Graduate School of Management contributed to this article. ❁

CONGRESSWOMAN TAKES ON GREEN JOBS

Representative Hilda L. Solis introduced the Green Jobs Act, which is included in a large energy package just signed into law by President Bush. Green jobs are jobs in the renewable energy and energy efficiency fields, such as energy efficient buildings and construction, renewable electric power, energy efficient vehicles and biofuels development. Jobs in these industries are clean, sustainable, good paying jobs that can put workers on a path to financial self-sufficiency, while supporting growth and development in energy efficiency and renewable technologies. A fourth-term Congresswoman from East Los Angeles, Solis (D-CA) spoke with Green Technology Magazine about the pending legislation.

GT: Why did you sponsor the Green Jobs Act?

Solis: I think it's really important when we talk about global warming, and the effects that it's having on our economy, that we make sure we integrate all the communities that are affected by it. We have to make sure that there's an incentive to provide for a pipeline for the green jobs that will be created by the development of alternative energy and other clean technologies and for career ladders to be established. We've lost so many jobs in this country. The Green Jobs Act will definitely be a tremendous jumpstart for our economy. More than 13 million workers, one in ten, will seek job training assistance this year. What better way than to include this major component—getting the economy to be green and creating green collar jobs.

GT: How will the Green Jobs Act work?

Solis: The Green Jobs Act will create a new program within the Workforce Investment Act structure at the Department of Labor that would provide grants to partnerships for green jobs training. The bill instructs the Department of Labor to consult with the Department of Energy in setting up the program. These partnerships would get community colleges



involved, labor apprenticeship programs involved and small businesses. It also allows high-end universities and other venture capitalist folks that might be interested in providing funds and tools to create these new jobs. A major national investment in renewable energy and energy efficiency could create more than three million new jobs and there will be a demand for workers. Right now there aren't enough skilled workers in these areas. For example, in California we lack enough of a skilled workforce to manufacture and install solar panels.

GT: How has the business community responded to this proposal?

Solis: Business groups have endorsed the Green Jobs Act. The National Association of Service Companies, which represents Southern California Edison, Pacific Gas and Electric, Synergy Companies and affiliates of ConEdison, is strongly behind the bill. Urban Habitat, the Ella Baker Center for Human Rights, the Apollo Alliance, Communities for a Better Environment, the IBEW, and AFL-CIO also support it. Some of our opponents say this is going to be some kind of federally subsidized program, when in fact it will help small business and venture capitalists, because down the line there will be a growing market supply and demand.

GT: What are the greatest benefits of the Green Jobs Act?

Solis: We're elevating the discussion about global climate change and re-tooling the economy, and we're not forgetting about the people that we typically leave behind, the core communities that can benefit from retraining and education to provide the labor pool that we don't have right now.

GT: Thank you.

Solis: You are very welcome. ✨



green

Means Jobs in House Bill

by Barbara Crane

Photo Flickr EGL Energy

Holding the line against global climate change and other environmental challenges means developing new non-polluting products, technologies and industries. With those will come a host of new jobs. US Representative Hilda Solis (D-CA), wants to make sure U.S. workers are skills-ready. She co-authored, with Rep. John Tierney (D-MA), the energy efficiency and renewable energy worker training program, or “Green Jobs Act,” which is part of the Energy Independence and Security Act (H.R. 6).

H.R. 6, also known as the Energy Bill, was signed into law by President Bush on December 19. The act authorizes \$125 million for workforce training in energy efficiency and renewable energy industries, such as construction, electric power, biofuels and automotive.

Solis says, “We know there’s an absence of non-technical personnel that are needed for us to advance in renewable energy and energy efficiency technology. What better way to meet that need than investing in our

own people here on our own shores?”

The act funds new job training efforts as well existing worker training sites, such as union apprenticeships, community college and local skills centers programs. Solis says, “Training could take place at a community college. In my district, Rio Hondo College is doing a fuel efficiency program. They’re getting people who would normally go for training in automotive repair to study hybrid technology. Training might also happen through an apprenticeship program at a local IBEW (International Brotherhood of Electrical Workers) facility. It could also be a vocational program at the East L.A. Skills Center or an adult education site where you can earn a certificate that enables you to get licensed for a good paying job here in California.”

The legislation provides that 20 percent of the funds will be allocated to specific pilot “Pathways out of Poverty” projects that ensure job training and job skills to “benefit low-income workers, unemployed youth and adults,

high school dropouts, or other underserved sectors of the workforce within areas of high poverty,” according to the language of the bill.

Van Jones, executive director of Oakland’s Ella Baker Center for Human Rights, campaigned for the inclusion of Pathways out of Poverty into the Green Jobs Act. “We ought to be taking people from the back of the line in the last century’s pollution-based jobs and putting them in the front of the line for this century’s green jobs. Inclusiveness and diversity have to be built in from the very beginning,” he says.

Kate Gordon, program director for the Apollo Alliance, which worked with the Ella Baker Center Pathways out of Poverty initiative, says that her organization’s mission is to help transform the American economy into a cleaner energy economy. The Pathways program offers 10 demonstration grants to community-based nonprofit organizations and others with experience serving low-income youth or adults.

The grants can provide basic skills training, job training or upgrade training as well as supportive services, such as childcare. “We can’t assume that jobs will be created and benefits will spread to everyone in the American economy,” Gordon explains. We need to pay attention upfront to unemployed and low salaried workers.” Jones and Gordon also see an economic justice component to the Green Jobs Act. Workers served by the Pathways out of Poverty grants are often those who live in neighborhoods impacted by major sources of pollution, such as coal fields, ports and major transportation arteries.

A national research program to be conducted by the Bureau of Labor Statistics is included within the act’s scope. The bureau will analyze workforce trends and future skill needs for renewable energy and energy efficiency technology. In addition, the Green Jobs Act seeks to bring together business, labor, educational institutions, community-based organizations and others in identifying the most promising industries for workforce training and the specific kinds of jobs that will be needed. Gordon says, “The Apollo Alliance feels strongly that green jobs programs need to be large integrated systems. The Green Jobs Act provides the policy needed for this and future programs.”

Oakland is hoping to develop a national model for workforce training programs. Last summer the city provided a \$250,000 grant for funded a Green Jobs Corps, spearheaded by the Oakland Apollo Alliance and the Ella Baker Center. The funds came from a portion of the settlement from the California energy crisis. As part of this effort, the city is putting together a Green Business Council to look at key industries, labor needs and the jobs people should be trained for. “Oakland is working hard to be strategic about this. It takes a little longer, but it makes the Green Jobs Corps into a real career ladder project. We need examples of successful green jobs programs,” says Ian Kim, Green-Collar Jobs Campaign Director

Photo Flickr TwentyEight



If a 15 percent renewable energy standard is adopted nationwide, California would gain 95,000 new manufacturing jobs.

for the Ella Baker Center.

Various studies have attempted to quantify the number of green jobs that are likely to be created in a shift toward the use of renewable energy. Some estimates peg the number as high as 3 to 10 million jobs over the next twenty years. Others are more conservative but nevertheless present an intriguing picture.

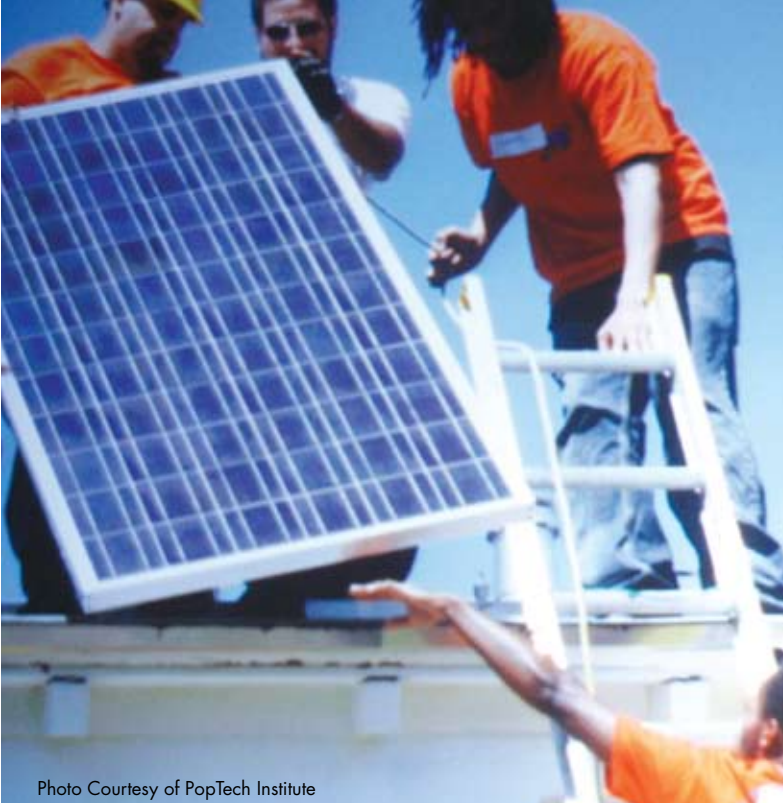
In the 2006 study, “Renewable Energy Demand: A Case Study of California,” the Washington-based Renewable Energy Policy Project (REPP) tracked the potential economic impact of renewable energy industries throughout the supply chain. They looked at the specific equipment needed by each of the industries—wind, solar, geothermal and biomass—and determined by North American Industrial Classification Systems codes (NAICS) where the components for each piece of equipment could be made, based on products the businesses were currently producing. REPP estimates that 850,000 new jobs would result if a 15 percent renewable energy standard were adopted nationwide. California would gain over 95,000 new manufacturing jobs with the largest share going to Southern California, which already has a well-established manufacturing base.

“The thing that the Bay Area has are the technologies that haven’t been discovered yet,” says George Sterzinger, REPP’s executive director. He emphasizes, “The whole purpose of

the analysis is not to predict what will happen but to show what could happen if policies were in place to make it happen.”

“I think there’s going to be a greater need to invest in workers and upgrade their skills. Managing for energy efficiency will require a new human resource model that values environmental performance. That’s going to be an exciting spin-off for these new jobs and the economy,” says Dave Foster, for 16 years a regional director of the United Steelworkers, and currently the executive director of the Blue Green Alliance. For example, construction workers involved in erecting very large wind turbines need a special skill set. “In other kinds of installations, particularly as you get into more sophisticated energy efficiency equipment, there will need to be specific training programs to match up the workforce with where the jobs are,” Foster says.

The promise of green jobs prompted Senators Bernie Sanders (Independent-VT) and Hillary Clinton (Democrat-NY) to co-sponsor the Green Jobs Act. “While there will of course be some economic dislocation that must be addressed,” said Sanders, “at the end of the day, as we move away from fossil fuels and toward energy efficiency and renewable energy, we can create millions of good paying jobs, jobs that will help us create a stronger economy.” ✨



Green Jobs Act Helps Fight Poverty and Pollution

by Van Jones



Photo Courtesy of PopTech Institute

For too long, low-income communities and people of color have been hit first and worst by toxic pollution and ecological disasters (like Katrina). Meanwhile, they've benefited last and least from new economic growth.

But eco-activists in marginalized communities are now beginning to speak out. No longer seeking merely "equal protection" from environmental harms, environmental justice advocates also want "equal access" to environmental solutions – including access to the huge economic opportunities emerging in the green economy.

Case in point – the Green Jobs Act of 2007. The measure, championed by U.S. Representatives Hilda Solis (D-CA) and John Tierney (D-MA), passed in August with the strong backing of Speaker Nancy Pelosi (D-CA), as part of the House energy package.

The Act authorizes \$125 million annually for "green-collar" job training. The sum may seem small. But those funds would prepare more than 30,000 people across the country every year for green-collar jobs such as solar panel installation, weatherizing buildings and maintaining wind farms.

And of special importance: \$25 million is allocated specifically for programs serving disadvantaged populations. By directing

educational opportunities to folks who most need employment and hope, the Green Jobs Act will create green "pathways out of poverty" by providing clean energy job training to those who most need work.

The legislation also will help our clean energy entrepreneurs, who are tackling a world-class challenge. To succeed, they need a world-class green-collar workforce, which the Act will help provide.

At long last, the Act finally begins to move the debate beyond the stale "jobs vs. the environment" shouting match and toward win-win solutions. According to research by Lifestyles of Health and Sustainability's *LOHAS Journal*, the U.S. economy's rapidly growing green sector generated \$208 billion in 2006, and this number increases each year. Today, our society can create jobs that pay well AND honor the environment – thereby fighting poverty and pollution at the same time.

Just as the government wisely nurtured high-tech industries like communications and aerospace, it should now support green industries, partly by ensuring a supply of job-ready workers.

In Detroit and other blue-collar towns that are hemorrhaging jobs, U.S. workers need new options. In the global economy, green-collar jobs are promising because they cannot be

outsourced to other countries.

Solar panels must be installed and wind farms must be constructed here. Almost every U.S. home needs retrofitting to save energy. And yet our houses and other buildings cannot be shipped to China or India. They must be weatherized where they stand — in the USA.

At their best, green-collar jobs offer living wages and upward mobility in stable, growing industries. And the influx of new workers into these skilled trades could help re-grow and reinvigorate America's labor unions.

That's why Congress worked so hard to include the Green Jobs Act in the energy package. It's also why the Apollo Alliance, Workforce Alliance, Center for American Progress, the Ella Baker Center, and Green For All rallied bi-partisan support for it. And it's why we're trying to get the word out about it.

I congratulate Congress for ushering through the Green Jobs Act so that it is now a reality — it's pro-family and pro-business, after all. The rest of us should cheer proposals like this, which wed economic opportunity with ecological sanity. ✿

Van Jones is co-founder and president of the Ella Baker Center for Human Rights in Oakland.

Green Jobs

Pay Off for Low Income Communities

Residents of low income communities are often caught in a dangerously closed loop. Substandard education leads to limited options after school; unskilled workers have fewer opportunities to gain the experience necessary to advance in the workplace. As a consequence, they cannot help their community grow the resources needed to improve vital services such as education. The City of Oakland's efforts to recreate itself as a sustainable city, however, could be the catalyst for a new paradigm.

justice, but [with the Apollo Alliance] we're expanding our range," Jones, who serves on the organization's national steering committee, said. "We're trying to keep kids out of trouble by focusing on job creation. When we asked ourselves, 'What kind of jobs do we want urban youth involved with?' we came to see that we wanted to aim our young people to the green area of the economy rather than the gray end. We didn't want them in the illegal economy where they could hurt people, but we didn't

useful for jobs in the green economy, for example, wiring a solar panel or retrofitting buildings for greater energy efficiency. The next step would be paid internships and on-the-job training. "Other organizations do this kind of training," said Ian Kim, policy director for Reclaim the Future, a green jobs initiative at the Ella Baker Center. "We want to line up funding and get the players to talk to each other so they believe in the possibility of green jobs and hand people off from one stage to the next."

Kim sees an opportunity to start a pilot Green Job Corps this year. As the result of a lawsuit against energy companies over rates charged during the 2000 oil crisis, Oakland will receive several million dollars. The money must be spent on renewable energy and energy efficiency. The Oakland Apollo



"We want to build a green economy that's strong enough to lift people out of poverty," said Van Jones, executive director of Oakland's Ella Baker Center for Human Rights. Jones is leading the way through the Apollo Alliance, a national coalition that works with states and cities to promote clean energy and create good jobs. Acting as a co-convenor (with the International Brotherhood of Electrical Workers, Local 195) of the Oakland Apollo Alliance, Jones is working with city officials, educators and environmental organizations to provide meaningful – and sustainable – jobs to those now on the lower end of the economic spectrum.

"The Ella Baker Center has traditionally focused on police misconduct and racial

Oakland City Councilmember Nancy Nadel addresses a large public rally celebrating the passage of Oakland's "Oil Independence by 2020" Resolution. The resolution made Oakland the first city in the nation to seriously explore what it means to use less oil – and generate jobs and economic growth in the process.

want to put them in the legal economy and hurt people by doing work that polluted the environment either."

The alliance's Western Regional Field Director Carla Din added, "If communities are negatively impacted by pollution—for instance, from air emissions at the Port of Oakland—we believe that they should be first in line for new green jobs."

The Oakland Apollo Alliance is working to set up a Green Job Corps—job training pathways that start with basic employment skills and continue into vocational skills

Alliance has applied for a grant that will be used to fund paid internships in renewable energy jobs. "It's a chance to train a class of twenty to thirty people in the job training pathway," Kim said.

The Oakland Apollo Alliance is also an active participant in many efforts to green the city, such as the mayor's green economy task force. "We see a lot of win/win in the growth of green technologies to heal our environment and heal our communities," Kim said. ✿

CAPTURING THE SUN AT EAST LOS ANGELES SKILLS CENTER

by Barbara Crane
Photos courtesy East Los Angeles Skills Center

starting photovoltaic businesses, homeowners, electricians, electronics engineers, building inspectors, and contractors thinking about becoming green businesses,” says Hurd.

East Los Angeles Skills Center is part of the Division of Adult and Career Education, Los Angeles Unified School District (LAUSD). Before proceeding to develop the new course, the District required that Hurd first evaluate the need. An advisory committee was set up that included the electrical union, International Brotherhood of Electrical Workers (IBEW), in-



Students installing a solar panel on the roofing display in the solar lab at East Los Angeles Skills Center.



Brian Hurd, a photovoltaic course designer and instructor, teaches a full class twice a week at East Los Angeles Skills Center.

With California in the midst of an unprecedented quest for clean energy, Brian Hurd, a vocational instructor at the East Los Angeles Skills Center (ELASC), realized that demand for photovoltaic installers was set to explode. The ELASC, an employment preparation and training center, serves a diverse community that includes at-risk youth. To ensure that all of his students could have a chance to enter the solar industry, Hurd developed a course of study that would prepare them.

Today, students at the center can earn the NABCEP (North American Board of Certified Energy Practitioner) entry-level certificate - the industry standard for certification - as photovoltaic installers after completing 400 hours of instruction and passing the NABCEP exam. Promoted simply by word of mouth, the course has proved so popular that the fourth consecutive introductory class has already begun, and the first group of students is ready to take the exam. “We have students across the spectrum - novices, people who are

dustry contractors, the PV inspector for the Los Angeles Department of Water & Power, and a representative from Southern California Edison.

“The executive director from NABCEP personally flew out here from New York to serve on the advisory committee,” Hurd says. “The committee unanimously agreed that the program is timely and needed. They talked about how hard it is to get trained entry level installers. Every one of the contractors on our board pledged to hire our graduates.”

After LASUD and the State of California approved the curriculum and course outline, the program was evaluated and formally approved by NABCEP. Since classes began in March 2007, demand has been so high that two additional instructors have been hired and another will be added shortly.

The photovoltaic installer program consists of two courses. An introductory prerequisite course of 100 hours offers students basic electrical theory, PV terminology, vocabulary, site evaluation, and sizing the system, among other funda-

nor's initiative) California Million Roofs. With added government incentives at the federal level or similar to the City of Berkeley's proposed sustainable energy financing district, everybody could potentially go solar," he says. "Germany is the number one nation in the world in use of solar energy, and yet they have only half our solar resource. We average 300 days of sunlight each year."

"These are new jobs," Hurd emphasizes, "jobs with a future. If only one in twenty Southern California homes were retrofitted with solar, there would be an amazing amount of jobs for skilled workers. But

Contractors Association. "We need skilled craftsmen going into the trades."

In addition to learning how to work with photovoltaic electricity, Martinez sees opportunity in training electricians to do energy audits on buildings, and then helping homeowners and business owners to upgrade their lighting systems and upgrade their HVAC systems to make them more energy efficient. "We have 30,000 existing electricians in the State of California, but I know there will be more opportunity. That's why we're growing our apprenticeship programs and expanding the continu-



Brian Hurd answers student questions during demonstration portion of PV instruction in the Solar Lab at East Los Angeles Skills Center.



Brian Hurd explains the wiring sequence for a grid tied system to students in the evening PV Installer class at East Los Angeles Skills Center.

mental topics. Students seeking NABCEP certification take a second course, consisting of 300 hours, which includes system design, PV safety, installation techniques, structural issues, hands on wiring activities, codes and inspections, rebates and incentives, trouble shooting and maintenance, and more. The entire program of 400 hours costs students only \$130.

Hurd foresees unlimited potential for the amount of work that could result from photovoltaic installations. "First, there is already a strong market with (the Govern-

we know that virtually every structure will eventually have solar. Imagine the clean air. Imagine the jobs!"

At the same time as the market for photovoltaic electricity is expanding, electrical workers from the baby boom generation are beginning to retire, creating potential shortfalls in skilled workers. "Alternative energy will boom in the next few years," says Thomas Martinez, Director of Business Development for the Labor Management Cooperation Committee, a partnership between the IBEW and the National Electrical

ing education programs for our journeymen electricians," Martinez says.

"There are so many opportunities for solar right now," says Hurd. "The main reason we started our photovoltaic installer program was to partner with solar contractors to provide a well-trained entry-level workforce to help meet this growing demand."

For more information on the photovoltaic installer program at East Los Angeles Skills Center, email brian@handsonsolar.com. ☼




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