Building Clean-Energy Industries and Green Jobs

Policy Innovations at the State and Local Government Level

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august 2010

General Acknowledgements

Cover photos by Jaime D. Ewalt and Wayne National Forest. Inside photos by David A Banks, Jaime D. Ewalt, David J. Hess, Matthew Hoffmann, and Neville Micallef.

Suggested Citation

Hess, David J., David A. Banks, Bob Darrow, Joseph Datko, Jaime D. Ewalt, Rebecca Gresh, Matthew Hoffmann, Anthony Sarkis, and Logan D.A. Williams. 2010. "Building Clean-Energy Industries and Green Jobs: Policy Innovations at the State and Local Government Level." Science and Technology Studies Department, Rensselaer Polytechnic Institute. www.davidjhess.org.

Corrections

If you find inaccuracies or have corrections, please email them to David Hess at hessd at rpi dot edu.

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Executive Summary

State and local governments have increasingly expanded their environmental and energy policies to become more integrated with job creation and economic development. The changes occurred before 2008, but they have been spurred by funding opportunities from the American Reinvestment and Recovery Act (ARRA) and the loss of manufacturing and other jobs that has occurred during the recession that began after the financial crisis of 2008. Policymakers are increasingly driven by a new, synthetic question: how can environmental and energy policies be configured to create new businesses and generate green jobs with the maximum impact and minimum expenditure?

Many states have a strong suite of "demand-side" policies for energy, that is, policies that encourage demand for renewable energy and energy-efficiency products. We argue that a successful state and local green-collar economy will require an equivalent suite of "supply-side," that is, economic development policies that ensure that the green businesses are there to provide the jobs that are emerging in the green economy. In other words, state and local governments must carefully craft environmental and energy policies to coincide with economic development efforts so that both sets of policies work together to enhance the growth of clean-energy manufacturing companies and innovation clusters. If the policies succeed in creating a wide range of green jobs, from installation and service delivery to manufacturing to high-tech innovation and entrepreneurship, they will likely receive widespread and growing support from voters, industry, advocacy groups, and policymakers.

There are many existing reviews of state and local government "demand" policies for renewable energy, energy-efficiency, and related energy goals, but to date there has been no comprehensive overview of how those policies are connected with green business development and job creation at the state and local government level. Initiatives in American states and cities were analyzed in order to identify best practices that link environmental policies with the creation of clean-energy industries and jobs. The study tracked the following clean-energy industries: biofuels, smart-grid and building technologies, solar energy, electric/hybrid transportation and energy storage, and wind.

Our research then used the review of policy innovations to develop a composite for state and local governments to use as a benchmark to measure their own progress toward bridging sustainability and green job development policies. The policy recommendations emerged from our review of approximately thirty states and over twenty-two cities.

State Governments

A state government that is serious about creating green jobs must first have in place "demand-side" policies that create the underlying economic demand for renewable energy and energy-efficiency goods and services. The demand-side policies are all tracked in numerous reports, such as those of the National Renwable Energy Laboratory and the Database of State Incentives for Renewables and Energy Efficiency. We do not attempt to duplicate that work. Rather, we use that work as a starting point. To summarize, demand-side policies can be divided into two groups, general policies and building-related policies. Over half of the American states have a fairly well-developed suite of general policies that includes at least some of the following:

- a renewable electricity standard
- an energy-efficiency standard
- a renewable fuels standard
- a system benefits chargea to support renewable energy and energy conservation programs
- net metering and interconnection policies
- decoupling of energy company profits from revenue growth
- greenhouse gas emissions reductions targets
- a feed-in tariff or related rate structure for renewable energy generation
- property-assessed clean-energy (PACE) bonds or (given that the fate of such programs has been restricted by national home-mortgage organizations) on-bill payment for energy-efficiency and renewable energy improvements

The second type of demand policy involves the greening of existing buildings and the construction of new buildings that meet standards such as those of the Leadership in Energy and Environmental Design (LEED) of the U.S. Green Building Council. The second set of demand policies are especially important because they create jobs in construction, retrofitting, and related building installation and maintenance industries, and the jobs can be tailored to the needs of cities and states with high levels of unemployment among relatively unskilled workers. (The term "retrofitting" is somewhat broader than "weatherization," but we will use the two as synonyms.) There are at least five major types of demand policies at the state government level for green-buildings policies (beyond energy-efficiency goals and standards noted above):

- energy-efficiency building targets equivalent to LEED silver certification for new construction and major renovations of state-government buildings (e.g., New Jersey's LEED silver requirements)
- system benefits funds oriented toward energy-efficiency and green-building changes (e.g., New York's NYSERDA programs)

- requirements for commercial building owners to audit the energy efficiency of the buildings and reveal the results (e.g., Washington state's requirements for transparency)
- long-term mandates for the energy efficiency of private-sectors buildings through the building codes, including even zero-emissions codes for new buildings (e.g., California's zero-emissions building codes)

Our work reviews those two groups of demand policies, but our focus is on the other side of green jobs policies. We identify fifteen groups of "supply-side" policies for clean-energy business development, that is, policies to help spur research, manufacturing, technology innovation, business creation, and job training. The policies are also presented in the table at the end of the executive summary. The numbers in the list that follows correspond to the columns in Table One:

(1) Identify, target, and roadmap specific clean-energy industries for development, based on existing research capacity and industrial strengths, and form industry-specific associations, programs, and initiatives to support the targeted industries (e.g., New York's Battery and Energy Storage Consortium).

(2) Conduct supply-chain analyses and establish programs to help supply-chain manufacturers retool (e.g., Ohio's analysis of the wind industry).

(3) Merge economic development policy (EDP) and energy policy (EP) functions into one department or set up an office and advisory group that coordinate economic development and energy programs (e.g., Michigan's Department of Energy, Labor, and Economic Growth).

(4) Support with matching funds and grants clean-energy research institutes and programs in the state's universities, with technology transfer potential to targeted specific clean-energy industries (e.g., California's energy-related research institutes and programs).

(5) Set up programs and consortia that facilitate communication on clean-energy research among the state's universities, national laboratories, and industry and that facilitate university-industry relations (UIRs, e.g., Colorado's Renewable Energy Collaboratory).

(6) Support competitions that identify and support clean-energy entrepreneurship and that link potential businesses with investors (e.g., Massachusetts Ignite Clean Energy Competition).

(7) Set up a technology park, incubator, test facilities, and other support structures focused on clean-energy business creation and development (e.g., Colorado's Clean Tech Incubator).

(8) Dedicate tax credits, enterprise zones, and other incentives specifically for the attraction, retention, and creation of clean-energy companies that engage in manufacturing, refining, software development, and other clean-technology (e.g., Oregon's BETC).

(9) Dedicate a single state-level organization (or a specified clean-energy staff and program within the state's economic development department) that assists in new clean-energy business growth and provides funding support from intitial stages to scaling up stages (e.g., Massachusetts Clean Energy Center).

(10) Allocate a portion of the state government's pension fund to in-state green business development, including new companies (e.g., New York's pension fund set-aside).

(11) Establish standards or policies that require in-state production, such as in-state manufacturing for wind-turbine components and biorefining for in-state consumption of biofuels (e.g., California's in-state biofuels targets).

(12) Target and set-aside state government economic development funds for programs that specifically support new business creation in specified clean-energy industries and use the funds to leverage federal government support (e.g., Michigan's NextEnergy and 21st Century Jobs Fund).

(13) Project green jobs growth by industry, either by the state government or by an associated organization, so that training programs in the state are connected to the industry demand for green jobs (e.g., the Pennsylvania Department of Labor and Industry's 2010 Green Jobs Report)

(14) Coordinate training programs and provide information that connects job seekers with green-jobs training programs (e.g., Ohio's Green Pathways program).

(15) Ensure that green jobs are inclusive, provide pathways out of poverty, and provide training opportunities for persons with employment barriers (e.g., California's green jobs programs).

City Governments

For city governments, the general demand policies are less prominent than at the state-government level, but many cities have climate action plans with overall goals for greenhouse-gas reduction, energy efficiency, and renewable energy. Several cities have also established an office of sustainability to coordinate policies. In addition, cities often have a suite of policies that will spur the demand for services in the weatherization, retrofitting, building auditing, and construction industries:

- Establish LEED silver or gold standards for new construction and renovations of public buildings (e.g., Portland's LEED gold standards).
- Set a goal to power the city government's electricity completely from renewable energy (e.g., the city of Grand Rapid's 100-percent renewable energy goal).
- Develop green-building guidebooks and weatherization manuals (e.g., Philadelphia's manuals).
- Establish financial incentives through local electricity service providers to motivate green-building improvements (e.g., Austin Energy's programs).
- Establish a Property Assessed Clean Energy (PACE) bonds program, but given the delays as a result of federal policy, establish alternative financing mechanisms such as a revolving loan fund with on-bill payment (e.g., Portland's on-bill payment program).
- Facilitate a building deconstruction program for unused and abandoned buildings (e.g., Cleveland's deconstruction program).
- Establish a greening program for the port and other industrial districts (e.g., the Los Los Angeles program for greening the port).
- Establish a green impact zone for low-income neighborhoods (e.g., the Kansas City green-impact zone)
- Make available a free or inexpensive energy audit program (e.g., Austin's home energy program).

- Require residential buildings to have an energy audit before sale and commercial buildings to have an energy rating (e.g., Austin's requirement).

As with the state-level analysis, we identified fifteen groups of "supply-side" policies that cities are using to encourage green business development and creation. Again, the numbers listed here represent columns in the table (see Table Two):

(1) Develop a city sustainability plan or climate action plan that goes beyond urban greening and emissions goals to establish goals for green job development (e.g., San José's green jobs goals).

(2) Undertake a self-assessment of industrial strengths and set goals for clean-energy or clean-tech business development that are a realistic match with the regional economy (e.g., the Portland plan for industrial cluster development).

(3) Develop a web site that identifies local green businesses for purchasing decisions (e.g., New York's web site for green manufacturing that is "made in New York").

(4) Help to establish a strong local sustainable business association that has programs for local and small business greening (e.g., the Sustainable Business Network of Greater Philadelphia).

(5) Host a national umbrella organization in a targeted clean-energy industry and/or regularly host national or international events for one or more clean-energy industries (e.g,. Austin's recruitment of Clean Technology and Sustainable Industries Association).

(6) Facilitate systematic connections among local universities, government representatives, business leaders, and nonprofit organizations (e.g., San Diego's Clean Tech Alliance).

(7) Host an annual sustainability summit or advisory council that engages all stakeholders to link diverse urban constituencies for clean-energy business development (e.g., Cleveland's sustainability summit).

(8) Establish a clean-tech corridor or industrial park (e.g., the Boston clean-tech district).

(9) Develop accelerated permitting and new zoning for clean-energy businesses (e.g., Seattle's accelerated permitting).

(10) Develop one-stop shopping for green business assistance, including marketing (e.g., Boston's one-stop shopping).

(11) Create links between new business ventures and capital (e.g., San José's incubator and other programs).

(12) Link local rail or renewable energy development to local manufacturing (e.g., Portland's Oregon Iron Works).

(13) Gather and disseminate information on diverse green job training options in the region, including outreach into high schools (e.g., New York's information program).

(14) Establish partnerships for green jobs training among the city government, community organizations, unions, high schools, and local educational institutions (e.g., the East Bay Green Corridor Partnership).

(15) Work with local organizations to ensure that green-jobs programs include multiskill training for persons with employment barriers and youth at risk (e.g., Chicago's multiskill training programs).

In summary, our research finds that in addition to the widely studied demand-side policies there is also a less well-recognized suite of policies that state and local governments can develop that help to strengthen local businesses that create green jobs. This report brings together

in one location the best practices of state and local governments in order to faciliate goal-setting and planning for a clean-energy transition that includes business development and job creation. Although not all of the policies can be applied in every state and local government context, the survey of policies provides many good ideas, often at a relatively low cost, for the greening of regional economies.

	1 Roadmaps & targets	2 Retool supply chain	3 Coordinate EDP & EP	4 CE research programs	5 UIR consortia	6 Develop VC relations	7 Incubator, testing	8 CE manufacturing incentives	9 One-stop assistance	10 Pension fund set-aside	11 In-state manufacturing/ refining	12 Econ. Development CE set-aside	13 Plan & project training	14 Coordinate training	15 Make training inclusive
CA	X		X	X	X	X	X	X		X	X	X	X	X	X
CO			X	X	X		X								
FL	X		X	X	X	X			X	X	X				
IA	X		X	X	X			X				X			
IL			X	X	X										
MA			X	X	X	X	X		X				X		
MI	X	X	X	X	X	X	X	X	X		X	X	X	X	
MN	X		X	X		X									
NJ			X	X	X			X			X	X	X	X	X
NM	X		X		X			X			X		X	X	
NY	X		X	X	X		X	X	X	X	X	X	X	X	X
OH	X	X		X	X	X	X	X	X			X	X	X	
OR	X		X	X	X			X					X	X	
PA		X		X							X		X		
TX					X		X						X	X	X
WA	X				X			X			X	X	X		X
WI	X	X	X	X	X	X			X						

Table One: Fifteen Leading Supply-Side Policies for State Governments

Key:
CE is "clean energy"
EDP is "economic development policy"
EP is "energy policy"
VC is "venture capital"

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Green jobs in plan	Targeted CE Industry	Purchasing Policy	Local sustainable business association	Host events & organizations	University-industry relations	Engage stakeholders	Corridor and/or park	Accelerated Permitting	One-stop shopping	Business & capital link	Local manufacturing	Publicize job training	Training partnerships	Inclusive training
ALBU		X									X		X	X	X
AUST				X	X		X	X						X	X
BOST	X			X	X		X			X	X				X
BOUL	X				X	X	X							X	
CHIC	X			X								X	X	X	X
CLEV	X					X	X				X				X
DENV					X		X		X		X		X	X	X
GRR	X		X	X	X	X				X	X				X
LA	X				X	X	X	X	X		X	X	X	X	X
MILW		X			X	X	X	X			X			X	X
MSP	X	X	X			X		X	X	X	X		X		X
NWK	X	X				X				X	X	X	X	X	X
NYC	X	X	X	X	X		X					X	X	X	X
OAK	X		X	X		X	X		X		X	X	X	X	X
ORLN	X							X				X			
PHIL	X	X	X	X		X	X						X	X	X
PORT	X	X		X				X				X		X	X
SAND	X	X			X	X			X		X		X	X	X
SJSE	X				X	X		X			X		X	X	X
SACR					X	X								X	X
SEAT								X						X	
SANF	X			X	X	X	X		X		X	X	X	X	X

Table Two: Fifteen Leading Supply-Side Policies for City Governments

Key:
CE is "clean energy"

Key to cities:
ALBU=Alburquerque, AUST=Austin, BOST=Boston, BOUL=Boulder, CHIC=Chicago, CLEV=Cleveland, DENV=Denver, GRR=Grand Rapids, LA=Los Angeles, MILW=Milwaukee, MSP=Minneapolis-St. Paul, NWK=Newark, NYC=New York City, OAK=Oakland, ORLN=Orlando, PHIL=Philadelphia, PORT=Portland, SAND=San Diego, SJSE=San Jose, SACR=Sacramento, SEAT=Seattle, SANF=San Francisco