GREEN JOBS**


Initial findings of the project Jobs and the Environment Initiative are: 1) “EP [environmental protection], economic growth, and jobs creation can be complementary and compatible” (p. 77); 2) By 2003, environmental protection was a $300 billion/year industry with 5 million jobs, mostly standard occupations such as accountants, engineers, factory workers and truck drivers; 3) At the state level, based on evidence from Florida, Michigan, Minnesota, North Carolina, Ohio, and Wisconsin, the relationship between environmental policies and economic growth is positive; and 4) Environmental jobs were concentrated in several sectors, “including manufacturing and professional, information, and scientific, and technical services,” the type of jobs states want to attract (p. 78). The authors note in particular that states overlook the potential of “using existing economic assistance policies and incentives to facilitate development of environmental industries and jobs” (p. 78).


The authors forecast the changes in economic structure, in particular in employment, that will result from climate policies requiring a 50% cut in global greenhouse gas emissions by the middle of the 21st century. They divide the expected results into three stages. In the short-term, employment will decline in carbon-intensive industries, while low carbon industries will see job creation. They quote a study that estimates fossil fuel industry unemployment causing a 4% reduction in U.S. GNP within the first 10 years of policy implementation. Medium-term effects will be felt more broadly throughout the economy with an increase in jobs in low-carbon sectors and traditional fuel industries that modify their technology. Countries that lead in low-carbon technology should improve their export potential. The authors voice the concern that unilateral implementation of carbon emission restrictions would lead to carbon-intensive sectors moving to countries with limited regulation, though there is evidence that regulation is not a key factor in firms’ location decisions. The prediction for the long-term is an increase in industrial innovation, with jobs being created in research and the development of low-carbon technologies.

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** International Standard Book Numbers (ISBN) are given to facilitate ordering from vendors or other purchasing outlets. URLs are correct as of the date of publication. This issue plus earlier ones can be found in PDF format at http://www.irs.princeton.edu/faculty/working_papers.php.

This is the most recent of the author's publications promoting a public service employment (PSE) program—a Green Jobs Corps—that could achieve both full employment and promote environmental sustainability. A public service employment program could both control production capacity and act as a labor reserve for the private sector. The federal government would offer basic wage and benefit employment packages to anyone willing to work. PSE would not be subject to the “rigidities associated with full employment in the private sector,” and its activities could be designed to avoid production bottlenecks and other structural problems (pp. 62-63). PSE programs could promote environmental sustainability by “us[ing] fewer natural resources, caus[ing] less pollution, and reduc[ing] ecological damage” (p. 63). Forstater sees most PSE activities as lower skill, but imagines that skills that PSE participants acquire could be applied in the private sector. Specific examples of environmentally sound jobs would be in the areas of recycling, repairing, reconditioning, energy efficient industries in heating, lighting, cooling and refrigeration, weatherizing, public education, rooftop gardening and urban landscaping, and monitoring compliance with environmental laws and regulations. Forstater concludes with an explanation of how ecological tax reform is consistent with modern functional finance to further environmental sustainability.


After reviewing research from the mid-1970s to the mid-1990s, the author contends that the conventional fear that there is a trade-off between protecting the environment and maintaining employment levels is not based in fact. Goodstein refutes the contention that there has been either net or gross job loss from environmental protection measures. Factoring in the job creation aspects of pollution control policies yields a small increase in net national employment. He does concede that for certain local industries, such as timber in the Pacific Northwest, environmental regulation has led to layoffs and that steps such as expanded job training and adjustment can address manufacturing job loss.


Green questions the scientific basis for Barack Obama’s campaign promise to create 5 million new jobs by increasing federal spending on renewable energy sources. In addition, he states that proposed government regulations and mandates would result in lost jobs in the coal, oil, gas, nuclear and automobile industries. The cost of creating new jobs in the renewable energy sector would be passed on to taxpayers and energy consumers.

www.unep.org/labour_environment/features/greenjobs-report.asp

Leading up to the United Nations meeting to update the Kyoto Protocol (Copenhagen, late 2009), the United Nations Environmental Programme commissioned this report which reviews both the social dimension (including working conditions and workers' rights) and the environmental situation of employment in energy, construction, transportation, manufacturing, agriculture, and forestry. The authors emphasize the strong potential of renewable energy to generate jobs, estimating an additional 8 million in solar and wind power alone by 2030. The problems that still exist include: 1) the need for more rapid growth of green jobs; 2) the expansion of green jobs in developing as well as developed countries; 3) the growing inequality of income throughout the world; and 4) the need for sustainable business practices. Their recommendation for corporate investment in addressing global climate change, a commitment by 30 leading U.S. and European investors with more than $8 trillion of assets in February 2008, was made before the extent of the current economic downturn was known.


A survey of over 9,500 private employers in Washington State was conducted to determine the number and types of jobs in the state's emerging green economy and establish a baseline to measure job and industry growth. The weighted results estimate that there are over 47,000 jobs, about 1.6% of all private employment, in four core green areas: 1) energy efficiency (over 1/2 of all green jobs); 2) preventing or reducing pollution (over 1/3 of all green jobs); 3) mitigation and clean-up of pollution (9% of all green jobs); and 4) renewable energy (approximately 4%). Other findings include: 1) Traditional job titles have been retained either because of employer choice or because the tasks involved have not radically changed; 2) Estimates of total earnings in green jobs amount to $2.2 billion annually; and 3) Over 47% of employers participating in the survey had industry certification in one or more green core areas. The report is part of a package entitled Green Jobs and Climate Action for consideration in the State's 2009 legislative session.


The authors examined 13 studies analyzing the economic and employment impacts of the clean energy industry in the United States and Europe. After accounting for varying assumptions, methods of analysis and units of reporting jobs, Kammen, Kapadia and Fripp developed a job creation model that illus-
trates the implications for five energy scenarios, each with a different combination of renewable and fossil fuel energy sources, giving a more realistic picture of a national electricity supply. Their results indicate that in all cases the Renewable Portfolio Standard produces more jobs in manufacturing, construction, installation, operations and maintenance, fuel production and processing per unit of energy delivered (per average megawatt) than the fossil fuel industries. The authors agree with other researchers, who found that environmental regulation has little to do with the declining employment rate in fossil-fuel industries. A coordinated, comprehensive energy policy that supports energy efficiency and sustainable transportation as well as the renewable energy industry should yield the best employment outcomes. They promote training and financial/tax incentives to aid fossil fuel industry workers who stand to lose their jobs.


Included in this report about recent trends in employment and job loss is a discussion of green job creation through infrastructure investment. Citing Congressional interest in providing funds for public works, a predictable response to recessions, Levine includes the new definition of “green” public works: “those in and related to industries that utilize renewable resources to produce their outputs . . . and jobs in and related to industries that produce energy-efficient goods and services” (p. 4). The North American Industry Classification System’s (NAICS) lack of a unique identification for green industries is one of the problems in estimating the number of jobs dependent upon green infrastructure activities. On the one hand, a number of renewable energy sources are grouped together in the “other” category, while on the other hand, the construction industry needs a unique sub-category for retrofitting. Other reporting problems involve projections of newly created jobs based on different assumptions and timeframes: 1) including jobs generated by green infrastructure activity as well as those created directly; 2) stating results for particular states that cannot be generalized to other states or the nation as a whole; and 3) expressing estimates per unit of power generated rather than per dollar of investment.


www.peri.umass.edu/236/hash/f49f4ad10b/publication/330/

“Green Recovery” is presented as a “jump-start” to a longer term economic strategy program, described in the Center for American Progress report Capturing the energy opportunity: creating a low-carbon economy, by John D. Podesta, Todd Stern, and Kit Barren (2007). To stimulate job growth over the next two years, the authors propose that the government spend $100 billion dollars in environmentally related jobs. Comparable to the April 2008 rebate check stimulus package, the program would create 2 million jobs in six green infrastructure investment areas: energy efficiency building retrofitting, expansion of mass transit and freight rail, “smart” electrical grid transmission systems con-

With graphs and charts as well as text, the authors show the current and potential number of green jobs (which they define as “employment that contributes to preserving or restoring environmental quality and avoiding future damage to Earth’s ecosystems” (p. 8)) in specific economic sectors: renewable energy, buildings, transportation, manufacturing (including iron and steel, aluminum, cement, pulp and paper), recycling, food and agriculture, and forestry. Developing the employment potential requires “massive and sustained investments” (p. 6) by both private industry and government to actively involve more countries and to change business practices to support “decent work.” They give brief examples of existing social-dialogue arrangements in Spain, Germany, the Netherlands, the United States, and Argentina. Earlier publications by Renner include *Working for the environment: a growing source of jobs* (Worldwatch Paper, 152, September, 2000, 85 p., $9.95, ISBN: 1-878071-54-8) and *Jobs in a sustainable economy* (Worldwatch Paper, 104, September, 1991, 58 p., $9.95, ISBN: 1-878071-05-X). Renner, Sweeney and Kubit also authored the UNEP report above.

### Legislation: Green Jobs Act of 2007

Among the major provisions of the *Energy Independence and Security Act of 2007* (PL 110-140), signed into law on December 19, 2007 as Title X, was the *Green Jobs Act of 2007* (H.R. 2847). The bill was proposed as an amendment to the *Workforce Investment Act of 1998*. It authorizes the Department of Labor to spend $125 million annually for training in the renewable-energy and energy efficiency sectors. The target populations are workers in the energy industry who need updated training, military veterans and reservists, unemployed workers, at-risk youth, and non-violent ex-convicts. The legislation also provides for a research program through the Bureau of Labor Statistics to track and assess workforce trends resulting from these initiatives.

The minority view of Republican members of the Committee on Education and Labor is included in the House report *Green Jobs Act of 2007* (July 27, 2007, SuDoc No. Y1.1/8:110-262, 34 p.). Their objections include: 1) the redundacy of programs
with existing federal job training services; 2) the inclusion of non-violent, ex-offenders for priority training; 3) special treatment for labor unions and the reduced roles of the local business communities; and 4) the prominence given energy jobs over other occupations such as nursing and skilled auto work.

Relevant to this law and to the issue of employment in the renewable energy industry were hearings held before the Subcommittee on Energy and Environment of the House Science and Technology Committee on “Research, Education and Training Programs to Facilitate Adoption of Solar Energy” on solar energy programs (June 19, 2007, SuDoc No. Y4.SCI2:110-41). Witnesses described current training, in both community colleges and technical schools, for students from 18 to 45 years of age, both full time college students and workers who want to change careers or upgrade their skills and called for additional and broader training based on industry standards. Joseph T. Sarubbi, of Hudson Valley Community College, stated that elements in his school’s success in solar training program were: 1) funding from New York State; 2) collaboration with local photovoltaic companies; and 3) a well-trained faculty.

Looking ahead to the economic stimulus package that will be considered by Congress in 2009, the Senate Energy and Natural Resources Committee held a hearing on December 10, 2008 to consider possible programs. Chairman Jeff Bingaman mentioned that the large number of proposals submitted will be posted on the Committee’s web site. Among the points made by the witnesses: 1) there are “shovel-ready” projects, with environmental impact statements in compliance with the National Environmental Policy Act (NEPA), already in the pipeline that are waiting for funding; 2) the government should maximize efficiency by going through existing agencies and authorities at both the federal and state levels; and 3) energy tax incentives for employers who hire new workers and through tax credits for retrofitting contractors would support job creation. Several witnesses forecast estimates of the number of jobs per investment dollar.

Vocational Guides to “Green Jobs”


The Department of Energy’s National Renewable Energy Laboratory (NREL) issued a fact sheet that describes the major renewable energy technologies (wind power, solar power, bioenergy, and geothermal energy) and the type of work each involves. Included is a list of organizations and web sites where additional occupational information can be found.

The Green Careers Journal “was created to provide individuals, current professionals, students, university colleges, departments and career offices with a publication that contains current job listings and information, as well as articles and insight on the environmental careers world” [Web site]. Each issue has a couple of brief articles plus an employer or professional profile and a calendar of events. The bulk of the issue is devoted to job ads and announcements, arranged by broad area (e.g., Biology/Ecology, Advocacy, Environmental Policy and Law, etc.). (The past issues archives can be found at www.environmental-career.com/gcj.htm; it was preceded by the National Environmental Employ-
Greenjobs (www.greenjobs.com)
Begun in 2004 "to focus specifically on all aspects of employment in renewable energy worldwide," the site offers job seekers career guidance, background information and current news about renewable energy industries, a directory of companies and organizations, as well as job listings and the opportunity to post their resumes and apply directly for openings. There is free registration for job seekers to store their resumes and apply for the posted jobs. The job search interface allows searches to be limited by location, job category (e.g. engineering or sales), industry and fulltime or part-time status. It does not allow for truncation, so a search for "retrofit" and "retrofitting" produce different results. Employers are charged to search resumes and post jobs; the site claims 50,000 visitors per month. The "Green Directory" is divided into separate sections for "business resources" (subdivided by renewable source), "government resources," and "associations," all subdivided by region of the world.

McNamee begins his guide by describing the development of and need for professional and skilled labor positions in the renewable-energy fields. He then devotes a chapter to each power source and to environmentally-oriented applications in other sectors, i.e. green building, energy management, green transportation, and teaching energy, as well as a chapter on nuclear electric power as a nonrenewable alternative. He briefly describes each technology, giving examples of its use, detailing the related job possibilities, and including a short description of existing projects in the field or information from practitioners. Each chapter has a section entitled "Knowledge Is Power," in which McNamee talks about the training or education the career requires and median salaries or wages. A resource section at the end of each chapter lists relevant organizations, web sites and publications.

MonsterTRAK (www.monstertrak.com)
Under the section "For Job Seekers," at the bottom of the main page of this employment web site, is a link labeled "Search green jobs" that leads to the section "GreenCareers." Keyword searches in the database of jobs can be limited by occupational category (Accounting/finance, Creative/design, etc.) and location (specific state or "international" for anything outside the United States). The "GreenCareers Guide" describes how the work world is responding to ecological concerns, distinguishing among "green," "green practices," "green industry," and "going green" companies. A section on career advice provides various kinds of information including necessary educational preparation and job search strategies. The site also provides news about the environment, information about volunteer opportunities and suggestions for making environmentally sound personal choices.

As with each of the five energy sectors reviewed in this book, the renewable energy industry has an entire chapter devoted to it. Both professional and manual labor occupations are described, including career profiles (salaries, responsibilities, prospects, and prerequisite education and experience) and typical career ladders. The four appendices contain directory information about: 1) educational institutions (four-year schools, arranged by state); 2) major trade periodicals and other publications; 3) professional, industry, and trade associations, guilds and unions; and 4) web sites. A glossary of energy terms and a brief bibliography about energy industries and occupations complete the volume.