



JOB OPPORTUNITIES FOR THE GREEN ECONOMY:

**A STATE-BY-STATE PICTURE OF OCCUPATIONS THAT
GAIN FROM GREEN INVESTMENTS**

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SUMMARY

This report provides a snapshot of what kinds of jobs are needed to build a green economy in the United States. We focus on six key strategies for attacking global warming and highlight some of the major “green jobs” associated with each of these approaches.

The six green strategies we examine here are: building retrofitting, mass transit, energy-efficient automobiles, wind power, solar power, and cellulosic biomass fuels. We show that the vast majority of jobs associated with these six green strategies are in the same areas of employment that people already work in today, in every region and state of the country. For example, constructing wind farms creates jobs for sheet metal workers, machinists and truck drivers, among many others. Increasing the energy efficiency of buildings through retrofitting relies, among others, on roofers, insulators and building inspectors. What makes these entirely familiar occupations “green jobs” is that the people working in them are contributing their everyday labors toward building a green economy. We therefore consider and refer to the strategies examined in this report as green investments, in addition to global warming solutions.

We present data on employment conditions in 12 separate states: Florida, Indiana, Minnesota, Missouri, Nebraska, New York, Ohio, Oregon, Pennsylvania, Tennessee, Virginia, and Wisconsin. For each of the 12 states, we report the number of people who are employed in each of the occupations that will be affected by our six green economy strategies, and what the average wages are in each state for each of these job types. We then also provide data on the national employment picture for each of the job categories we examine.



What is clear from this report is that millions of U.S. workers—across a wide range of familiar occupations, states, and income and skill levels—will all benefit from the project of defeating global warming and transforming the United States into a green economy.

JOB OPPORTUNITIES FOR THE GREEN ECONOMY

Fighting global warming and transforming the United States into a green economy is a massive and defining challenge for our time. It is the work of a generation, and specifically, the work of millions of people, performing the jobs needed to build the green economy.

This report provides information on what kinds of jobs are needed to fight global warming and build a green economy in the United States. A green economy is based on the efficient use of energy, reducing polluting emissions, and the use of renewable sources of power. A green economy uses these investments to create new opportunities, good jobs, and stronger communities. The term “green jobs” has spread rapidly over the past year. We seek to make the term concrete by highlighting many—but by no means all—of the occupations that will play a central role in building the green economy.

We do not attempt here to estimate how much growth there is likely to be in any area of green investments or green jobs in the United States. Our aim is much

more modest: to simply provide a snapshot of some of the key industries and occupations that will experience increasing growth through green investments. In work that is forthcoming later this summer with the Center for American Progress, we will provide a detailed study on what employment growth could be in the United States under various green economy scenarios.¹

We focus here on six key strategies for attacking global warming and highlight some of the major occupations associated with each of the strategies. In the table below, we provide a list of the six green economy strategies that we examine—building retrofitting, mass transit, energy-efficient automobiles, wind power, solar power, and cellulosic biomass fuels—and a list of representative occupations that will be needed for advancing each of these strategies.² In the detailed tables that follow, we present data on total employment in each state for each of the occupations and the average wage workers earn in these occupations.

JOBS THAT WILL BUILD THE GREEN U.S. ECONOMY AND FIGHT GLOBAL WARMING

Strategies for Green Economy Investments	Representative Jobs
Building Retrofitting	Electricians, Heating/Air Conditioning Installers, Carpenters, Construction Equipment Operators, Roofers, Insulation Workers, Carpenter Helpers, Industrial Truck Drivers, Construction Managers, Building Inspectors
Mass Transit	Civil Engineers, Rail Track Layers, Electricians, Welders, Metal Fabricators, Engine Assemblers, Production Helpers, Bus Drivers, First-Line Transportation Supervisors, Dispatchers
Energy-Efficient Automobiles	Computer Software Engineers, Electrical Engineers, Engineering Technicians, Welders, Transportation Equipment Painters, Metal Fabricators, Computer-Controlled Machine Operators, Engine Assemblers, Production Helpers, Operations Managers
Wind Power	Environmental Engineers, Iron and Steel Workers, Millwrights, Sheet Metal Workers, Machinists, Electrical Equipment Assemblers, Construction Equipment Operators, Industrial Truck Drivers, Industrial Production Managers, First-Line Production Supervisors
Solar Power	Electrical Engineers, Electricians, Industrial Machinery Mechanics, Welders, Metal Fabricators, Electrical Equipment Assemblers, Construction Equipment Operators, Installation Helpers, Laborers, Construction Managers
Cellulosic Biofuels	Chemical Engineers, Chemists, Chemical Equipment Operators, Chemical Technicians, Mixing and Blending Machine Operators, Agricultural Workers, Industrial Truck Drivers, Farm Product Purchasers, Agricultural and Forestry Supervisors, Agricultural Inspectors



¹ To be more specific, the authors of the forthcoming study with the Center for American Progress are Robert Pollin, Heidi Garrett-Peltier, James Heintz, and Helen Scharber.

² These six strategies are of course by no means exhaustive. For example, a 2007 study by McKinsey and Company, “Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?” discusses five broad clusters of approaches to reducing greenhouse emissions, including improving energy efficiency in buildings and appliances; increasing fuel efficiency in vehicles and reducing carbon intensity of transportation fuels; improving efficiency in energy-intensive industrial production; expanding and enhancing carbon sinks; and reducing the carbon intensity of electrical power production. Within these five broad clusters, they identify a total of 41 strategies that, in combination, are capable of significantly reducing greenhouse emissions at no net cost to the economy.



As we show, new job activities will certainly be created in building the green economy and implementing global warming solutions, such as installing solar panels and researching new ways to build efficient biofuel engines. But the vast majority of green jobs are in the same areas of employment that people already work in today, in every region and state of the country. For example, constructing wind farms creates jobs for sheet metal workers, machinists and truck drivers, among many others. Increasing the energy efficiency of buildings through retrofitting relies, among others, on roofers, insulators and building inspectors. Expanding mass transit systems employs civil engineers, electricians, and dispatchers. So green jobs don't just mean new jobs—they can also mean greater job security for people who already work in these fields.

What makes these entirely familiar occupations “green jobs” is that the people working in them are contributing their everyday labors toward environmental solutions. Put simply, a green job is one that is contributing to fighting global warming and building a green economy. Train operators who currently deliver furniture may one day deliver wind turbine component parts, meaning that their work will be contributing to a green economy that solves global warming and builds healthier communities. This same green economy is creating new employment in rail transportation.

At the same time, it is important to link the idea of green jobs with *decent* employment opportunities: jobs that pay at least a living wage, and offer career ladders, training opportunities and some measure of security. A green economy should be one that is sustainable along two equally important dimensions: for the environment itself, of course; but also in terms of people's ability to live at a decent material standard and to enjoy basic rights and opportunities at their workplaces. From the data in this study it is clear that pursuing solutions to climate change can produce good jobs that are broadly based throughout our economy.

COMPILING THE DATA

In the tables that follow, we consider employment conditions in 12 separate states: Florida, Indiana, Minnesota, Missouri, Nebraska, New York, Ohio, Oregon, Pennsylvania, Tennessee, Virginia, and Wisconsin. For each of the 12 states, we report the number of people who are employed in each of the occupations that will be affected by our six global warming strategies, and what the average wages are in each state for each of these job types. We then also provide data on the national employment picture for each of the job categories we examine.

To compile these data, we began by consulting the 2005 industrial census of the Bureau of Economic Analysis, U.S. Department of Commerce. This enabled us to see which industries would be actively involved in advancing the six green investment strategies. These include, for example, the construction industry for building retrofitting, manufacturing for building wind turbines, and agriculture and forestry for producing biomass fuels from switchgrass or wood chips—so-called “cellulosic” biomass.