

Will the “clean economy” help grow jobs?

“The ‘green’ or ‘clean’ or low-carbon economy—defined as the sector of the economy that produces goods and services with an environmental benefit—remains at once a compelling aspiration and an enigma.” This is stated in “Sizing the Clean Economy: A National and Regional Green Jobs Assessment” (Brookings Institution Report, July 13, 2011, <http://www.brookings.edu/research/reports/2011/07/13-clean-economy>), a report in which authors Mark Muro, Jonathan Rothwell, and Devashree Saha, along with Battelle Memorial Institute’s Technology Partnership Practice, address the difficulty in defining, measuring, and isolating green or clean activities and jobs related to environmental goals. As the authors point out, the clean economy is nebulous in nature, there is no standard definition or agreed-upon set of data, and little is known about the clean economy’s nature, size, and growth at a regional level.

To bring clarity and cohesion to these problems, the Metropolitan Policy Program at the Brookings Institution worked with Battelle to create a database of establishment-level employment statistics and used them to analyze clean economy industries in the United States and its metropolitan areas. What follow are some of the labor market conclusions drawn from this database.

The clean economy employs 2.7 million workers from a wide range of industries and employs more workers than the fossil fuel industry. Most of the clean economy jobs are found in manufacturing and in the provision of public services such

as wastewater treatment and mass transit. Approximately 26 percent of all clean economy jobs are found in the manufacturing sector; in contrast, manufacturing accounts for only 9 percent of the nation’s total job count. About \$20,000 worth of exports is sold for each clean economy job compared with about \$10,000 for each job in the overall economy. In the clean economy, the heavily manufacturing-intensive industries produce electric vehicles, green chemical products, and lighting, while the biofuels, green chemicals, and electric vehicles industries are the highly export-intensive ones. The newer and more identifiable clean industries—such as solar photovoltaic, wind, fuel cell, smart grid, biofuel, and battery industries—employ a smaller segment of the clean economy workers.

The clean economy is unique in terms of earnings and upward mobility for the workers it employs. Median wages in the clean economy are 13 percent higher than the median for all U.S. wages, yet a sizable number of clean economy employees have relatively little formal education for their moderately well-paying “green collar” job.

When the clean economy is examined on a regional basis, the South has the largest number of clean economy jobs and the West has a disproportionate share relative to its population. Of the 21 states with at least 50,000 clean economy jobs, 7 are in the South. California has the highest number of clean jobs, but when measured on a per worker basis, Alaska and Oregon have the most per worker.

The authors of the report conclude that analysis of the clean economy warrants excitement and optimism

at a time when the nation is searching for new sources of high-quality growth. They have found a sizable and diverse array of growth in private sector green industries, although growth in green industries overall has been slightly slower than that of the nation’s sluggish economy during the 2003–2010 period. They also acknowledge that the growth of clean industries has been hampered by policies that do not strengthen domestic demand nor make financing easily accessible. The authors end with the question, “Will the nation marshal the will to make the most of those industries?”

Building green (rather than little red) schoolhouses

Few things are as important to parents as the education of their children—make that the first-rate and safe education of their children. As Gregory Kats, a former director at the U.S. Department of Energy and current president of Capital E, a national clean energy advisory and venture capital firm, champions in his article, “Greening America’s Schools: Costs and Benefits” (A Capital E Report, October 2006, www.usgbc.org/ShowFile.aspx?DocumentID=2908), using green technologies in designing, building, and operating schools enriches the learning experience for 21st-century students and benefits society at large.

By studying the costs and benefits of 30 green schools built in 10 states between 2001 and 2006, the author illustrates that, although in some cases green schools can be built for the same cost as a conventional school, usually the initial cost

of building green is a little more. However, the long-term financial, environmental, and other benefits of building green vastly outweigh a green school's original investment.

Just how much more does it cost to build a green school with more natural lighting; improved ventilation and temperature control; increased use of renewal energy; green, planted roofs; and better indoor air quality? With national school construction averaging \$150 per square foot, a green school initially costs about \$3 per square foot more to build than a conventional school; that is, the "green premium" comes to about 2 percent of the upfront cost of building. However, a number of studies have found that green schools reduce some of the nonfinancial costs of conventional school buildings, such as health risks that contribute to illness and absenteeism (for both teachers and students) and educational disadvantages that bring down test scores—particularly among lower income and minority children.

A look at the financial bottom line shows that the societal long-term financial benefits of green schools are some \$70 per square foot, with about \$12 per square foot accruing directly to the schools through lower health costs, higher teacher retention, and reduced life-cycle operating costs. Green schools use an average of 33 percent less energy. And not only do green schools save money, but reduced energy demand locally can lower its market price on a state-wide or national level. In addition

to reducing water pollution, green schools realize savings by recycling water and waste rather than disposing of it. The 30 schools in the study reduced water usage by approximately a third, with water and waste water reduction achieved through the use of green roofs, greywater systems, and rainwater catchment. The construction of green schools contributed to municipal infrastructure improvements by making less use of water-delivery and treatment facilities.

Green schools lower emissions of pollutants that contribute to climate change and global warming; by reducing nitrogen oxides (a principal component of smog), sulfur dioxide (a principal cause of acid rain), carbon dioxide (the principal greenhouse gas), and coarse particulate matter (a principal cause of respiratory illness and contributor to smog), green buildings will become increasingly important.

Kats predicts a net financial benefit for green schools over a 20-year period to be \$71 per square foot. The total results from per-square-foot savings of \$9 in the cost of energy, \$1 in the cost of emissions, \$1 in the cost of water and wastewater, \$49 from increased future earnings of students, \$3 from asthma reduction, \$5 from cold and flu reduction, \$4 from teacher retention, and \$2 from the employment impact.

According to the U.S. General Accounting Office, one-fourth of all students attend schools that are below standard or are dangerous, and

many more students attend schools that are in need of repairs to their air conditioning or other systems that can affect students' health. At three of the green schools analyzed by this study, student attendance rose by 5 to 15 percent; green schools also experienced a reduction in teacher sick days. Additionally, studies have shown that green schools enhance student performance, as demonstrated by higher test scores. Improved performance can contribute to increased lifetime earnings. (A study is cited which contends that an increase in test scores from the 50th percentile to the 85th percentile in high school mathematics translates into 12 percent higher annual earnings.)

Another important benefit—both currently and in the future—is the positive impact on jobs. In addition to increased teacher retention, construction using green technologies usually means an increase in employment, because green design—energy efficiency, substituting renewable for nonrenewable energy, and waste diversion—requires greater employment than does construction following conventional building codes.

Kats concludes that building green schools is not only cost effective, with overall financial benefits 20 times higher than initial costs, but is a far better design choice for society than building conventional schools. So why not turn the little red schoolhouses of the past into state-of-the-art environmental—and student-friendly—green halls of learning? □