
The cost of Obama's green dreams

Can Americans afford the new president's plan?

Katrina Dunkley

PRESIDENT Barack Obama has pledged to create five million “green” jobs¹ in the next decade (Obama and Biden, 2009). With the unemployment rate already topping 7% in the United States, substantial job creation would be most welcome (US-BLS, 2009). But the potential benefits of the new president's plan must be weighed against its costs. In this respect, the Obama green dream is not economically sound. The green jobs agenda will cost the taxpayer dearly in lost GDP, higher subsidization, and decreased productivity.

President Obama formulated his “new energy economy” plan early in his presidential campaign to promote his green credentials. If it is implemented, the United States will spend \$150 billion over the next decade to subsidize a slew of “renewable” energy projects. Greater demand for costlier energy will be stimulated through the imposition of a federal cap-and-trade program,² mandatory quotas on the purchase of renewable energy,³ and more stringent automotive fuel economy standards.

Expectations vs. reality

OBAMA is not the first president to push green energy. His predecessor, George W. Bush, bemoaned America's “addiction to oil,” while former President Bill Clinton instructed federal agencies to install “renewable energy technologies” (EIA, 1999). There is considerable political momentum behind transforming North America's energy mix, and bi-

partisan support for reducing America's supposed dependence on foreign oil.⁴

The premise of Obama's plan is that taxpayer subsidies of renewable energy will deliver millions of “green-collar” jobs. Currently, green jobs account for an estimated 2.37 million jobs worldwide, according to a report by the United Nations Environment Program (2008).

Billions of dollars have already been invested in the development of alter-

There is a tendency within the environmental lobby to exaggerate the employment benefits of energy subsidies. For example, the American Solar Energy Society claims that renewable energy and related services have generated 8.5 million jobs in the United States, and it predicts that 40 million green jobs will be created by 2030 (Bezdek, 2007).

But only a handful of studies offer empirical evidence supporting claims

The green jobs agenda will cost the taxpayer dearly in lost GDP, higher subsidization, and decreased productivity.

native energy (EIA, 2007). In 2007, for example, wind power received federal subsidies totalling a whopping \$23.37 per Megawatt-hour (MWh), while solar power received subsidies of \$24.34/MWh (EIA, 2007).⁵ Yet even with these “incentives,” as well as high oil and natural gas prices, wind and solar only managed 32 billion KWh of electrical generation while receiving \$738 million in federal support. By comparison, coal generated 1,946 billion KWh hours while receiving a subsidy of \$854 million (EIA, 2008b). In 2007, renewable energy⁶ accounted for only 7% of the United States' total energy supply (EIA, 2008b). Thus, policy makers and the public have reason to question the wisdom of providing even more subsidies to this industry, and assuming the twin burdens of costlier mandates and increased government spending in pursuit of a carbon-free future.

about the creation of green jobs. One of the better known, released by the Center for American Progress, found that two million green jobs are created for every \$100 billion of government spending on green infrastructure investments, such as mass transit and “smart” electrical grid systems (Pollin et al., 2008). However, the study failed to account for the jobs that would be lost as a result of a cap-and-trade scheme and other significant regulatory costs.

In addition, it is important to note that government subsidies do not create jobs if no new economic activity is being created; resources are simply being shifted around the economy. In contrast, it is more accurate—and revealing—to calculate the number of jobs created in producing a unit of energy from alternative energy sources compared to those created from conventional sources. This

approach allows us to assess the productivity of jobs by energy type, as well as the cost of job creation.

Modeling the green dream

As table 1 shows, there were 1.77 million workers in the American oil and gas industries in 2007. On a per-worker basis, just over 3,200 barrels of oil (and natural gas equivalent) were produced at a labor cost of \$12.66/barrel (IPAA, 2007). In contrast, there were about 750,000 green energy workers. The production-to-labor ratio for these workers was equivalent to 1,605 barrels of oil per worker at a labor cost of \$25.26/barrel (US Conference of Mayors, 2008).⁷ At the same time, the

alternative energy sector received more than \$4.87 billion in subsidies—more than twice the amount received by the oil and gas sector (\$2.14 billion) (EIA, 2007).

Under the Obama plan, \$150 billion in subsidies would be awarded to renewable energy projects to generate five million new green jobs between now and 2020. Jobs in the oil and gas sector would increase at the annual average rate of 1% (IPAA, 2007). A cap-and-trade regime would also be imposed, and the production of corn ethanol would reach levels close to those mandated by the Energy Independence and Security Act of 2007: 15 billion gallons. In this new scenario, renewable energy would contribute be-

tween 10% and 15% of the total electricity supply (EIA, 2008a). Given these assumptions, it is reasonable to expect alternative energy output to reach approximately 16 quadrillion BTU⁸ by 2020 (table 2). Barring severe restrictions on oil and gas activity, the petroleum sector could be expected to generate the equivalent of 35 quadrillion BTU in 2020 (EIA, 2008c).⁹

Based on these figures, the cost per green worker would increase significantly between now and 2020, along with the relative rate of subsidization. The rate of subsidization is expected to rise because green jobs would face diminishing returns (without economies of scale). The reason why more green jobs would be created per government dollar

Table 1: Productivity and labor costs in the renewable energy and petroleum sectors in the United States, 2007

| | Number of workers | Production (quad BTU) | Production/Labor (billion BTU/worker) | Production/Labor (BOE/worker) | Labor cost/Barrel of oil equivalent (\$/BOE) | Federal subsidy (\$ billions) |
|-----------|-------------------|-----------------------|---------------------------------------|-------------------------------|--|-------------------------------|
| Renewable | 750,000 | 6.98 | 9.31 | 1,604.60 | \$25.26 | \$4.875 |
| Petroleum | 1,772,000 | 32.91 | 18.57 | 3,202.11 | \$12.66 | \$2.149 |

Note: 1 barrel of oil or oil-equivalent (BOE) is equal to 5.8 million British thermal units (BTU).

Sources: EIA, 2008c; EIA, 2007; IPAA, 2007.

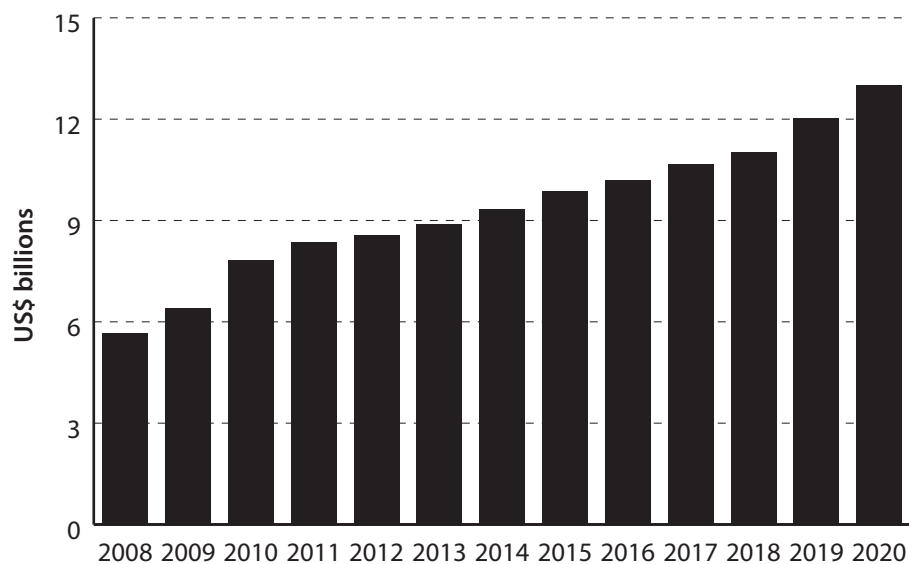
Table 2: Projected productivity and labor costs in the renewable energy and petroleum sectors in the United States, 2020

| | Number of workers | Production (quad BTU) | Production/Labor (billion BTU/worker) | Production/Labor (BOE/worker) | Labor cost/Barrel of oil equivalent (\$/BOE) | Federal subsidy 2009-2020 (\$ billions) |
|-----------|-------------------|-----------------------|---------------------------------------|-------------------------------|--|---|
| Renewable | 5,750,000 | 15.92 | 2.77 | 477.50 | \$84.89 | \$116.20 |
| Petroleum | 2,016,701 | 35.38 | 17.54 | 3,024.92 | \$13.40 | \$49.99 |

Note: 1 barrel of oil or oil-equivalent (BOE) is equal to 5.8 million British thermal units (BTU).

Sources: EIA, 2008c; EIA, 2007; IPAA, 2007.

Figure 1: Total estimated annual federal subsidy for renewable energy in the United States, 2008-2020 (not including conventional hydroelectric)



Source: EIA 2008a; calculations by author.

Table 3: The cost of creating green jobs, 2009-2020

| | |
|--|-----------------------|
| Green stimulus package | \$150 billion |
| Cumulative subsidization for renewable energy ¹ | \$116.2 billion |
| Cumulative budget deficit ² | \$15.4 billion |
| Economic losses (GDP, manufacturing jobs) ³ | \$1.8 trillion |
| Opportunity cost ⁴ | \$424 million |
| Total cost | \$2.1 trillion |
| Total cost per green job⁵ | \$418,800 |

Notes:

1 Cumulative subsidization is calculated yearly and totalled in electric production (per MWh) and non-electric consumption (per BTU) in each the renewable and petroleum sector through 2020.

2 As estimated by the Congressional Budget Office (2008).

3 Economic losses are calculated as a cumulative, yearly GDP loss as estimated by the ACCF and NAM study (2008).

4 Opportunity costs are calculated as the net loss to the economy of 5 million green laborers working at a cost of \$84.89/BOE compared to \$13.40/BOE for petroleum workers in 2020.

5 Total costs divided by the number of green workers.

Sources: Obama and Biden, 2009; EIA, 2008a; Congressional Budget Office, 2008; ACCF and NAM, 2008.

of spending is that more workers would be needed to make up the productivity deficit. Compared to the oil and gas sector, green workers are much less productive in terms of their energy output, and at a relatively higher cost. As indicated in table 1, in 2007, renewable energy workers were about 50% as productive for twice the cost. By 2020 (table 2), renewable energy workers would be only 15% as productive as oil and gas workers at a labor cost that is just over six times as high. In addition, the federal support given to the renewable sector is expected to increase steadily over the next decade.

Figure 1 illustrates the renewable energy subsidies that the green jobs agenda will require over time, as more public incentives are needed to meet portfolio standards and mandates.

Furthermore, recent studies have found that the Obama plan could lead to long-term budget deficits, and could contribute to net losses in GDP (Congressional Budget Office, 2008; ACCF and NAM, 2008). Moreover, because public funds could have been allocated to more efficient projects, there would be opportunity costs as well. Opportunity costs are calculated as the net loss to the economy of five million green laborers working at a cost of \$84.89/BOE compared to \$13.40/BOE for petroleum workers.

Table 3 highlights the total potential cumulative costs per green job during the 2009-2020 period. The expected costs of subsidization, the impact on the budget deficit, the economic losses in manufacturing and GDP, and the opportunity costs of inefficient resource allocation total an astounding \$418,800 per green job. Any net savings that supporters of Obama's plan are expecting to gain from the creation of green jobs are likely to fail to materialize because of these costs.

Conclusion

FROM a public policy perspective, there is considerable value in analyzing claims

about the benefits of green job subsidies. It would be prudent for Americans to consider whether they can afford to make Obama's green dream a reality.

Notes

1 The United Nations defines a green job as a job that "helps to protect and restore ecosystems and biodiversity, reduces energy consumption, decarbonizes the economy, and minimizes or altogether avoids the generation of all forms of waste and pollution" (UNEP, 2008).

2 Under a cap-and-trade system, the government sets an overall limit (cap) on emissions. Based on that cap, quotas are imposed on individual sources of emissions, such as utilities and factories. The government allocates "allowances" to each facility that represents the volume of their quota. A facility must either reduce emissions to meet the quota or purchase allowances from emitters that have exceeded their required reductions (trade).

3 This type of regulation is known as a Renewable Portfolio Standard.

4 It is worth noting that Canada is currently the single largest "foreign" supplier of crude oil and natural gas to the United States (Canada, 2009).

5 A subsidy of \$23.37/MWh is equivalent to 2.3 cents per kilowatt-hour (kWh); \$24.34/MWh is equivalent to 2.4 cents per kWh. An average household consumes about 1,000 kilowatt-hours per month (EIA, 2008d).

6 Renewable energy includes solar, hydroelectric, geothermal, biomass, and wind power.

7 This calculation assumes that all the workers are paid the industry average of \$40,533 per year (US-BLS, 2008).

8 BTU stands for British thermal unit. The metric equivalent of the BTU is the Joule. One quad is equal to approximately 1.055 Exajoules (10^{18} Joules).

9 The Energy Information Agency (2008d) estimates that annual petroleum production will equal 38.55 quadrillion BTU in 2020.

References

- American Council for Capital Formation and the National Association of Manufacturers [ACCF and NAM] (2008). *Analysis of the Lieberman-Warner Climate Security Act (S.2191) Using the National Energy Modeling System (NEMS/ACCF/NAM)*. <http://www.accf.org/media/dynamic/1/media_190.pdf>.
- Bezdek, Robert, for the American Solar Energy Society (2007). *Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century*. American Solar Energy Society. <<http://www.ases.org/images/stories/ASES-JobsReport-Final.pdf>>.
- Canada (2009). *Canada-US Energy Relations*. Government of Canada. <http://www.canadainternational.gc.ca/washington/bilat_can/energy-energie.aspx?lang=eng&menu_id=341&menu=L>.
- Congressional Budget Office (2008). *Congressional Budget Office Cost Estimate: S.2191 America's Climate Security Act of 2007*. <<http://www.cbo.gov/ftpdocs/91xx/doc9120/s2191.pdf>>.
- Energy Information Agency [EIA] (1999). *Annual Energy Outlook 2000: Legislation and Regulation*. <http://www.eia.doe.gov/oiaf/archive/ae000/leg_reg.html>.
- Energy Information Agency [EIA] (2007). *Federal Financial Interventions and Subsidies in Energy Markets 2007*. <<http://www.eia.doe.gov/oiaf/servicerpt/subsidy2/pdf/execsum.pdf>>.
- Energy Information Agency [EIA] (2008a). *Annual Energy Outlook 2008*. <<http://www.eia.doe.gov/oiaf/archive/ae08/index.html>>.
- Energy Information Agency [EIA] (2008b). *Energy In Brief: How Much Renewable Energy Do We Use?* <http://tonto.eia.doe.gov/energy_in_brief/print_pages/renewable_energy.pdf>.
- Energy Information Agency [EIA] (2008c). *Energy Market and Economic Impacts of S. 2191, The Lieberman-Warner Climate Security Act of 2007*. <<http://www.eia.doe.gov/oiaf/servicerpt/s2191/index.html>>.
- Energy Information Agency [EIA] (2008d). *Frequently Asked Questions - Electricity* <http://tonto.eia.doe.gov/ask/electricity_faqs.asp>.
- Energy Information Agency [EIA] (2008e). *Annual Energy Outlook 2009 Early Release*. <<http://www.eia.doe.gov/oiaf/aeo/>>.
- Independent Petroleum Association of America [IPAA] (2007). *US Petroleum Statistics: Oil and Gas Employment*. <<http://www.ipaa.org/reports/industrystats/usps/usps.asp?Table=Chart18>>.
- Obama, Barack, and Joe Biden (2009). *The Obama-Biden Plan*. The Office of the President-Elect. <http://change.gov/agenda/energy_and_environment_agenda/>.
- Pollin, Robert (2008). *Testimony before House Committee on Education and Labor Hearing on "Building an Economic Recovery Package: Creating and Preserving Jobs in America"*. <http://www.peri.umass.edu/fileadmin/pdf/other_publication_types/pollin_testimony.pdf>.
- Pollin, Robert, Heidi Garrett-Peltier, James Heintz, and Helen Scharber (2008). *Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy*. Center for American Progress. <http://www.peri.umass.edu/fileadmin/pdf/other_publication_types/peri_report.pdf>.
- United Nations Environment Program [UNEP] (2008). *UNEP Background Paper on Green Jobs*. <http://www.unep.org/labor_environment/PDFs/GreenJobs-Background-paper-18-01-08.pdf>.
- United States Conference of Mayors (2008). *Current and Potential Green Jobs in the US Economy*. <<http://www.usmayors.org/pressreleases/uploads/GreenJobsReport.pdf>>.
- United States, Department of Labor, Bureau of Labor Statistics [US-BLS] (2008). *National Compensation Survey: Occupational Earnings in the United States, 2007*. <<http://www.bls.gov/ncs/ncswage2007.htm>>.
- United States, Department of Labor, Bureau of Labor Statistics [US-BLS] (2009). *Employment Situation Summary*. News release (February 6). <<http://www.bls.gov/news.release/empsit.nro.htm>>. ■