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The Myth of Green Energy Jobs: The European Experience

By Kenneth P. Green

With $2.3 billion in Recovery Act tax credits allocated for green manufacturers, President Barack Obama and other Democratic politicians have high hopes for green technology. But their expectations clash with both economic theory and practical experience in Europe. Green programs in Spain destroyed 2.2 jobs for every green job created, while the capital needed for one green job in Italy could create almost five jobs in the general economy. Wind and solar power have raised household energy prices by 7.5 percent in Germany, and Denmark has the highest electricity prices in the European Union. Central planners in the United States trying to promote green industry will fare no better at creating jobs or stimulating the economy.

Green is the new black, in both the United States and Europe. Virtually everyone on the left has thrown on the green pants, green shirts, and green cloak of what we are assured is the future of life on earth as we know it.

President Obama regularly references the green economy in his speeches. The Obama/Biden New Energy for America document released in 2008 focuses on green jobs, green technology, green manufacturing, green buildings, and even green veterans. In a speech to the Democratic National Committee in September 2010, Obama boasted, "We'd been falling behind and now we are back at the forefront of [research and development]. We made the largest investment in green energy in our history so that we could start building solar panels and wind turbines all around the country."[1]

In an August 13 speech, Vice President Joe Biden also sang the praises of greenness: "It's not enough to just rescue the economy, we have to rebuild it better—and that work begins with giving American manufacturers the resources to produce the clean, green energy technology that will be the foundation of our 21st century economy. With the launch today of $2.3 billion in Recovery Act tax credits for green manufacturers, we are going to ramp up manufacturing of green energy materials in this country, while creating thousands of new jobs right here in our own backyard. From wind and solar power to electric vehicle technology, our recovery is going to be fueled by the Recovery Act incentives we are offering businesses today that will be the engine of our economy tomorrow."[2]

Former speaker Nancy Pelosi (D-CA) also supports the green cause. A blurb describing a

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Key points in this *Outlook*:

- The Obama administration, its allies in Congress, and the environmental community champion the benefits of green technology and the creation of green jobs to alleviate unemployment.
- Green jobs merely replace jobs in other sectors and actually contribute less to economic growth.
- Experiments with renewable energy in Europe have led to job loss, higher energy prices, and corruption.

speech Pelosi gave to the Stanley School in Waltham, Massachusetts, begins, "For a brighter and more prosperous future, we must invest in a green infrastructure, a green economy, and green schools to create a workforce of good-paying green collar American jobs."[3]

Governments do not "create" jobs; the willingness of entrepreneurs to invest their capital, paired with consumer demand for goods and services, does that.

Of course, Senator Harry Reid (D-NV) was not left out. At a Senate Democratic Green Jobs Summit in 2009, Reid boasted of his green accomplishments: "We have made unprecedented investments in clean, renewable energy and new, green jobs that can never be outsourced. In 2007 we passed a landmark energy bill that led to the development of clean, renewable fuels here at home, and the creation of critical American manufacturing jobs. We raised fuel-efficiency standards for the first time in a generation, and set new energy-efficiency standards for lighting, appliances, and federal office buildings and vehicles. In the economic recovery plan we passed this year, we invested $67 billion to develop clean energy, and $500 million more to train a new 'green-collar' workforce—Americans who each day will make our nation more energy efficient and energy independent."

So, at least on the left, it is unanimous: the world's future is green: green energy powering green technologies, creating green houses, buildings, cars, and jobs, jobs, jobs. But is this thinking based on realistic economics, realistic understanding about green technology, or realistic expectations of the growth potential of the green movement? This *Outlook* examines whether the government creates jobs through subsidies of any sort and then looks at the troubling European experience with green energy and job creation.

Green Energy and Green Jobs

To understand the fallacy of the government creating green jobs through subsidies and regulations, we have to refer to the writing of French economist Frédéric Bastiat. Back in 1850, Bastiat explained the fallacy that underlies such thinking in an essay about the unseen costs of such efforts. He called it the "broken window" fallacy.

The fallacy works as follows: imagine some shopkeepers get their windows broken by a rock-throwing child. At first, people sympathize with the shopkeepers, until someone claims that the broken windows really are not that bad. After all, they "create work" for the glassmaker, who might then be able to buy more food, benefiting the grocer, or buy more clothes, benefiting the tailor. If enough windows are broken, the glassmaker might even hire an assistant, creating a job.

Did the child therefore do a public service by breaking the windows? No. We must also consider what the shopkeepers would have done with the money they used to fix their windows, had those windows not been broken. Most likely, the shopkeepers would have plowed that money back into their store; perhaps they would have bought more stock from their suppliers or hired new employees.

Were the windows not broken, the town would still have had jobs created by the shopkeepers' alternate spending, plus the shopkeepers would have had the value of their original windows. Because the value of the windows was destroyed, however, they—and the village as a whole—have been made poorer.

It is well understood, among economists, that governments do not "create" jobs; the willingness of entrepreneurs to invest their capital, paired with consumer demand for goods and services, does that. All the government can do is subsidize some industries while jacking up costs for others. In the green case, it is destroying jobs in the conventional energy sector—and most likely in other industrial sectors—through taxes and subsidies to new green companies that will use taxpayer dollars to undercut the competition. The subsidized jobs "created" are, by definition, less efficient uses of capital than market-created jobs. That means they are less economically productive than the jobs they displace and contribute less to economic growth. Finally, the good produced by government-favored jobs is inherently a non-economic good that has to be maintained indefinitely, often without an economic revenue model, as in the case of roads, rail systems, mass transit, and probably windmills, solar-power installations, and other green technologies.

To understand how this works in practice, I now turn to European countries that went hog wild for renewables, while singing the praises of green jobs: Spain, Italy, Germany, Denmark, the United Kingdom (UK), and the Netherlands.

Spain

Spain has long been considered a leader in the drive to renewable power. Indeed, Obama singled out Spain as an example in a 2009 speech. The president said, "We have enormous commercial ties between our two countries and we pledged to work diligently to strengthen them, particularly around key issues like renewable energy and transportation, where Spain has been a worldwide leader and the United States I think has enormous potential to move forward."[4]

But the story of Spain's green-job leadership took a series of hits shortly after the president's speech. In March 2009, researchers Gabriel Calzada Alvarez and colleagues at the Universidad Rey Juan Carlos released a study examining the economic and employment effects of Spain's aggressive push into renewables. What they found confounds the usual green-job rhetoric:[5]

- Since 2000, Spain spent €571,138 on each green job, including subsidies of more than €1 million per job in the wind industry.
- The programs creating those jobs destroyed nearly 110,500 jobs elsewhere in the economy (2.2 jobs destroyed for every green job created).
- The high cost of electricity mainly affects production costs and levels of employment in metallurgy, nonmetallic mining and food processing, and beverage and tobacco industries.
- Each "green" megawatt installed destroys 5.28 jobs elsewhere in the economy on average.
- These costs do not reflect Spain's particular approach but rather the nature of schemes to promote renewable energy sources.

Spain has found its foray into renewable energy to be unsustainable. *Bloomberg* reports that Spain slashed subsidies for new solar power plants.[6] As analyst Andrew McKillop observes in the *Energy Tribune*:

> In Spain, where subsidies to the country's massive windfarms and their dependent industries is estimated to have attained as much as 12 billion Euros in 2009, either directly or through "feed-in tariff" subsidy for power sales, government proposals target at least a 30% cut in subsidies. Major wind energy producer firms, such as Gamesa, have begun cutting their workforces, while trying to find sales outside Europe, helped by a weaker Euro. In addition and due to Spain's highly exposed deficit finance status, making it a target for market speculators betting its bond rates must rise, the Spanish government is also likely to cut financial backing to existing renewable energy power plants, built with an expectation of guaranteed prices and government subsidies for 25 years.[7]

And then, there is the matter of corruption. As *Bloomberg Businessweek* reports, "An audit of solar-power generation from November 2009 to January 2010 found that some panel operators were paid for doing the 'impossible'—producing electricity from sunlight during the night."[8] Further, it appears that the solar power producers "may have run diesel-burning generators and sold the output as solar power, which earns several times more than electricity from fossil fuels." Nineteen people have been arrested in Spain's "clean energy" sector on charges ranging from bribery, to unsavory land deals, to issuing licenses to friends and family, to simple construction fraud. As the *Guardian* reports, "When Spain's National Commission for Energy decided to inspect 30 solar gardens, it found only 13 of them had been built properly and were actually dumping electricity into the network."[9]

Italy

A similar situation has played out in Italy, also a leader in wind and solar-power deployment. A study performed by Luciano Lavecchia and Carlo Stagnaro of Italy's Bruno Leoni Institute found an even worse situation:

> Finally, we have compared the average stock of capital per worker in the RES [Renewable Energy Systems] with the average stock of capital per worker in the industry and the entire economy, finding an average ratio of 6.9 and 4.8, respectively. To put it otherwise, the same amount of capital that creates one job in the green sector, would create 6.9 or 4.8 if invested in the industry or the economy in general, respectively—although differences exist between RES themselves, with wind power more likely to create jobs than

> [photovoltaic] power. This fact is particularly relevant because we didn't even consider the non-trivial value of the renewable energy produced, but we focused on pure subsidies. If we had considered the energy value, the average stock of capital per worker would result even higher. Since subsidies are forcibly taken away from the economic cycle, and allocated for political purposes, it is especially important to have a clear vision of what consequences they beg.[10]

The researchers also found that the vast majority of green jobs created were temporary: "Using what we see as inflated estimates, from various sources, of already-existing green jobs, we take between 9,000 and 26,000 jobs in wind power, and between 5,500 and 14,500 in photovoltaic energy, as our starting point. From there, we have calculated that thanks to the subsidies Rome has promised, the number of people working in the green economy will rise to an aggregate total of between 50,000 to 112,000 by 2020. However, most of those jobs—at least 60%—will be for installers or other temporary work that will disappear once a photovoltaic panel, or a wind tower, is operative."[11]

And like Spain, Italy has experienced rampant corruption in the renewable sector. Rather than having numerous individuals defrauding the government, however, the mafia is involved. As Nick Squires and Nick Meo report in the *Telegraph*, "Attracted by the prospect of generous grants designed to boost the use of alternative energies, the so-called 'eco Mafia' has begun fraudulently creaming off millions of euros from both the Italian government and the European Union."[12] They go on to report:

> Eight people were arrested in Operation "Eolo," named after Aeolus, the ancient Greek god of winds, on charges of bribing officials in the coastal town of Mazara del Vallo with gifts of luxury cars and individual bribes of €30,000–70,000.
>
> Police wiretaps showed the extent of the mafia's infiltration of the wind energy sector when they intercepted an alleged mafioso telling his wife, "Not one turbine blade will be built in Mazara unless I agree to it."
>
> In another operation last November, code-named "Gone with the Wind," fifteen people were arrested on suspicion of trying to embezzle up to €30 million in European Union funds. Among those arrested on fraud charges was the president of Italy's National Wind Energy Association, Oreste Vigorito.

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Germany

Germany's foray into renewable energy started in earnest in 1997, when the European Union adopted a goal of generating 12 percent of its electricity from renewable sources.[13] Germany's method for achieving such targets was the institution of a feed-in law, which required utilities to purchase different kinds of renewable energy at different rates. In a study of the effects of Germany's aggressive promotion of wind and solar power, Manuel Frondel noted that the German feed-in law required utilities to buy solar power at a rate of fifty-nine cents per kilowatt-hour, far above the normal cost of conventional electricity, which was between three and ten cents. Feed-in subsidies for wind power, he observed, were 300 percent higher than conventional electricity costs.[14]

Needless to say, this massive subsidizing of wind and solar power attracted a lot of investors: after all, if the government is going to guarantee a market for several decades, and set a price high enough for renewable producers to make a profit from, capital will flow into the market. Germany became the second-largest producer of wind energy after the United States, and its investment in solar power was aggressive as well.

But according to Frondel, things did not work out as Germany's politicians and environmentalists said they would. Rather than bringing economic benefits in terms of lower-cost energy and a proliferation of green-energy jobs, the implementation of wind and solar power raised household energy rates by 7.5 percent. Further, while greenhouse gas emissions were abated, the cost was astonishingly high: over $1,000 per ton for solar power, and over $80 per ton for wind power. Given that the carbon price in the European Trading System was about $19 per ton at the time, greenhouse gas emissions from wind and solar were not great investments.

Frondel concludes that "German renewable energy policy, and in particular the adopted feed-in tariff scheme, has failed to harness the market incentives needed to ensure a viable and cost-effective introduction of renewable energies into the country's energy portfolio. To the contrary, the government's support mechanisms have in many respects subverted these incentives, resulting in massive expenditures that show little long-term promise for stimulating the economy, protecting the environment, or increasing energy security. In the case of photovoltaics, Germany's subsidization regime has reached a level that by far exceeds average wages, with per-worker subsidies as high as 175,000 €(US$240,000)." He adds:

> In conclusion, government policy has failed to harness the market incentives needed to ensure a viable and cost-effective introduction of renewable energies into Germany's energy portfolio. To the contrary, Germany's principal mechanism of supporting renewable technologies through feed-in tariffs imposes high costs without any of the alleged positive impacts on emissions reductions, employment, energy security, or technological innovation. Policymakers should thus scrutinize Germany's experience, including in the US, where there are currently nearly 400 federal and state programs in place that provide financial incentives for renewable energy. Although Germany's promotion of renewable energies is commonly portrayed in the media as setting a "shining example in providing a harvest for the world" (*The Guardian* 2007), we would instead regard the country's experience as a cautionary tale of massively expensive environmental and energy policy that is devoid of economic and environmental benefits.

As with Spain and Italy, Germany is finding it hard to continue to subsidize wind and solar power at existing levels. In May, the German parliament cut back the subsidy for domestic rooftop solar photovoltaic systems by 16 percent, with free-standing systems cut by 15 percent.[15]

Denmark

Denmark is yet another country that has made wind power a hallmark of its energy policy. Obama praised it for its aggressive wind-power program, telling an Earth Day audience in Iowa that "America produces less than 3 percent of our electricity through renewable sources like wind and solar—less than 3 percent. Now, in comparison, Denmark produces almost 20 percent of their electricity through wind power."[16] The US Energy Information Administration tells America's children that "Denmark ranks ninth in the world in wind power capacity, but generates about 20% of its electricity from wind."[17] That sounds impressive, but is it true?

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Not according to CEPOS, a Danish think tank, which issued a 2009 report entitled *Wind Energy, the Case of Denmark.*[18] The CEPOS study found that rather than generating 20 percent of its energy from wind, "Denmark generates the equivalent of about 19% of its electricity demand with wind turbines, but wind power contributes far less than 19% of the nation's electricity demand. The claim that Denmark derives about 20% of its electricity from wind overstates matters. Being highly intermittent, wind power has recently (2006) met as little as 5% of Denmark's annual electricity consumption with an average over the last five years of 9.7%."

The CEPOS study revealed that Denmark can only produce and consume as much wind power as it does due to a convenient circumstance: neighboring countries have a lot of hydro power that can quickly and effectively balance the flow of electricity on its energy grid, allowing it to export surplus wind capacity. "Denmark manages to keep the electricity systems balanced due to having the benefit of its particular neighbors and their electricity mix. Norway and Sweden provide Denmark, Germany and Netherlands access to significant amounts of fast, short term balancing reserve, via interconnectors. They effectively act as Denmark's 'electricity storage batteries.' Norwegian and Swedish hydropower can be rapidly turned up and down, and Norway's lakes effectively 'store' some portion of Danish wind power. Over the last eight years West Denmark has exported (couldn't use), on average, 57% of the wind power it generated and East Denmark an average of 45%. The correlation between high wind output and net outflows makes the case that there is a large component of wind energy in the outflow indisputable."

Finally, the CEPOS study found that Danish consumers are the ones who take it on the chin. Denmark's electricity prices are the highest in the entire European Union. And the greenhouse gas reduction benefits? Slim to none, since the exported wind power replaces hydro power, which does not produce significant greenhouse gas emissions. The wind power consumed in Denmark does displace some fossil-fuel emissions, but at some cost: $124 per ton, nearly six times the price on the European Trading System.

Regarding green jobs, CEPOS found "that the effect of the government subsidy has been to shift employment from more productive employment in other sectors to less productive employment in the wind industry. As a consequence, Danish GDP is approximately 1.8 billion DKK ($270 million) lower than it would have been if the wind sector work force was employed elsewhere."

Not surprisingly, Denmark is also finding renewable power unsustainable and is backing away from the technology. As Andrew Gilligan reports in the *Telegraph*, the Danish state-owned power industry will no longer build onshore wind turbines, and consumers are complaining about high energy rates and environmental despoliation. "Earlier this year, a new national anti-wind body, Neighbours of Large Wind Turbines, was created. More than 40 civic groups have become members. 'People are fed up with having their property devalued and sleep ruined by noise from large wind turbines,' says the association's president, Boye Jensen Odsherred. 'We receive constant calls from civic groups that want to join.'"[19]

The United Kingdom

Our Commonwealth cousins across the pond have also embraced the "green power means green jobs" theory. The UK (Scotland particularly) has pursued an ambitious wind-power agenda.

Former prime minister Gordon Brown told a Labor Party conference, "I am asking the climate change committee to report by October on the case for, by 2050 not a 60% reduction in our carbon emissions, but an 80% cut and I want British companies and British workers to seize the opportunity and lead the world in the transformation to a low carbon economy and I believe that we can create in modern green manufacturing and service one million new jobs."[20]

Ed Miliband, current leader of the opposition, is also big on wind, announcing, "With strong government backing, the UK is consolidating its lead in offshore wind energy. We already have more offshore wind energy than any other country, we have the biggest wind farm in the world about to start construction, and now we'll see the biggest turbine blades in the world made here in Britain. . . . Our coastline means the offshore wind industry has the potential to employ tens of thousands of workers by 2020."[21]

Party does not seem to be a factor in green-job boosting. Prime Minister (and Conservative Party leader) David Cameron, discussing a deal to work on wind turbines with India, said, "The innovation and creativity of business won't just help us save the planet, but is expected to create millions of jobs and billions of revenue in the green goods and services market."[22]

Referring to offshore wind, Cameron is equally bullish: "I want us to be a world leader in offshore wind energy," he said, announcing a national infrastructure plan. "We are making these investments so that major manufacturers will decide that this is the place they want to come and build their offshore wind turbines. This investment is good for jobs and growth, and good for ensuring we have clean energy."[23]

Alas, the UK and Scotland have fared no better than the other countries discussed above in their pursuit of the new green-energy/green-jobs economy, as a recent report by consultancy Verso Economics points out.[24] The study is particularly interesting because its methodology is touted as superior to the methodology used in the Spanish and Italian studies. Verso uses what economists refer to as "input/output" tables to estimate the number of jobs that were foregone in the UK general economy in favor of the green jobs "created" through government subsidies.

Verso's conclusion aligns neatly with those of the Spanish and Italian studies discussed above:

- "The report's key finding is that for every job created in the UK in renewable energy, 3.7 jobs are lost. In Scotland there is no net benefit from government support for the sector, and probably a small net loss of jobs."

- "The main policy tool used to promote renewable energy generation is the Renewables Obligation, which effectively raises the market price paid for electricity from renewable sources. This scheme cost electricity consumers £1.1 [billion] in the UK and around £100 [million] in Scotland in 2009/10."

- "This report uses the Scottish Government's own macroeconomic model for Scotland to assess the impact of identified costs on jobs. A similar model was used by the Scottish Government to measure the opportunity cost of the cut in [the value-added tax] implemented in 2008–09. Based on this, policy to promote renewable energy in the UK has an opportunity cost of 10,000 direct jobs in 2009/10 and 1,200 jobs in Scotland."

- "In conclusion, policy to promote the renewable electricity sector in both Scotland and the UK is economically damaging. Government should not see this as an economic opportunity, therefore, but should focus debate instead on whether these costs, and the damage done to the environment, are worth the candle in terms of climate change mitigation."[25]

While the UK and Scotland may have avoided the problems of corruption that afflicted Spain and Italy, they learned something that the warmer countries did not: wind turbines can freeze in winter. Not only do they cease to put out power in very cold weather, they actually need to be heated. As reporter Richard Littlejohn points out in the UK *Daily Mail*, "Over the past three weeks, with demand for power at record levels because of the freezing weather, there have been days when the contribution of our forests of wind turbines has been precisely nothing. It gets better. As the temperature has plummeted, the turbines have had to be heated to prevent them seizing up. Consequently, they have been consuming more electricity than they generate. Even on a good day they rarely work above a quarter of their theoretical capacity. And in high winds they have to be switched off altogether to prevent damage."[26]

The frozen turbine problem has also occurred in Canada. As Greg Weston of the *Telegraph-Journal* explained in February 2011, "A $200-million wind farm in northern New Brunswick is frozen solid, cutting off a supply of renewable energy for NB Power. The 25-kilometre stretch of wind turbines, 70 kilometres northwest of Bathurst, has been shut down for several weeks due to heavy ice covering the blades. GDF Suez Energy, the company that owns and operates the site, is working to return the windmills to working order, a spokeswoman says."[27]

The Netherlands

The Netherlands is yet another country that went big for wind power; it is the world's third-largest producer of offshore wind power. And while no data are available about green jobs in the Netherlands, there is evidence that it will not be producing many through its green power plants. The new conservative government has radically reversed course and is slashing subsidies to wind and solar power.

According to the journal *Energy Debate*, the Dutch government has lost its faith in windmills. The new government in the Netherlands has taken exception to the massive subsidies required to build and operate wind farms—and, in this case, to the expected export of €4.5 billion in subsidies to a German company (Bard Engineering) that would have built, owned, and operated those wind farms. The new prime minister of the Netherlands, Mark Rutte, is reported to have said, "Windmills turn on subsidies."[28]

On November 30, 2010, the government unveiled its new renewables plan, slashing annual subsidies from €4 billion to €1.5 billion. And not only are the subsidies cut back, what remains will be redirected well away from wind power. As *Energy Debate* explains:

> In the new system (somewhat misleadingly called SDE-plus), which will take effect halfway through 2011, the government will allocate subsidies in an entirely different, and rather complicated way. Subsidies are made available in four "stages" (on the basis of first-come, first-served).
>
> 1) In the first stage, a government subsidy of 9 eurocents per kWh (or 79 cents per m^3 for gas) is offered, but only to producers of technologies that have "deficits" of less than 9 eurocents. Based on the figures from ECN, these are: biogas ("green gas"), hydropower, power from waste processing installations, and gas from fermentation processes.
>
> 2) If there is still money left after this first stage, the second stage will be opened up, in which a subsidy of 11 eurocents per kWh (or 97 cents per m^3) will be offered. This stage will be open to producers of onshore wind power and fertiliser-based gas.

3) Again, if there is money left, there will be a third stage with subsidies of 13 cents per kWh or 114 cents per m^3. This will be open to producers of hydropower and small-scale biomass.

4) The fourth and last stage (15 cents per kWh or 132 cents per m^3) will be open to electricity produced from all-purpose fermentation processes.

Not included in any of the four categories, because they are too expensive, are solar power, large-scale biomass and, indeed, offshore wind power.[29]

Another change in the Dutch attitude toward renewables is how to pay for the subsidies. In the past, subsidies came from the general budget. Moving forward, consumers will see a surcharge on their energy bills. The new direct billing could cool the public's ardor for additional building of "green energy."

According to reports, the new government was planning on a nuclear power renaissance to generate electricity, and one could certainly argue that such a plan would generate "green jobs."[30] However, in the wake of the tragic Japanese earthquake and tsunami in March 2011, such a plan will also undergo a great deal of scrutiny.

The irony here is rich. The Dutch, who have been enamored of wind power for hundreds of years,[31] may have finally had enough tilting at windmills. If even they cannot make it work, one has to wonder if anyone can.

Conclusion

Both economic theory and the experience of European countries that have attempted to build a green-energy economy that will create green jobs reveal that such thinking is deeply fallacious. Spain, Italy, Germany, Denmark, the UK, and the Netherlands have all tried and failed to accomplish positive outcomes with renewable energy. Some will suggest that the United States is different, and that US planners will have the wisdom to make the green economy work here. But there is no getting around the fact that you do not improve your economy or create jobs by breaking windows, and US planners are no more omniscient than those in Europe.

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