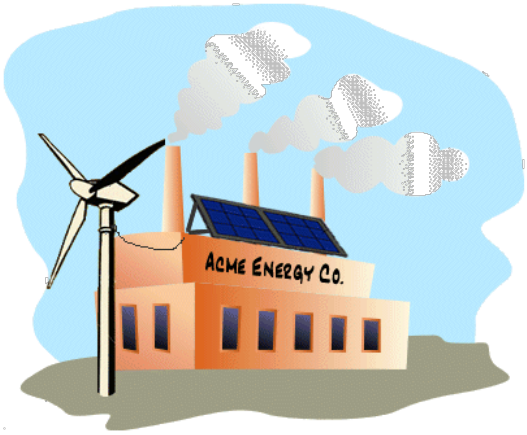
The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

How To Create A Million Clean Energy Jobs

Posted by JoulesBurn on January 19, 2011 - 11:41am



The current economic distress has invigorated the discussion about jobs creation as a way to incubate new growth. Alternative energy advocates who previously have been singing for more government support for environmental reasons have added verses which claim that green investments will be a stimulus as opposed to a drag on the economy. In divvying out stimulus money for energy projects, the Obama administration has made their preference for alternative energy clear. Traditional energy advocates, such as the American Petroleum Institute, are not happy with this tune and are defending their turf. The argument has evolved into one of which energy industry can claim the most new jobs created and the greatest economic bang for the stimulus buck. It is true that job creation is necessary to maintain social order, and it is hard to argue that there is a downside to a lot of employment in the clean energy sector.

But I will. Everything you have read recently about energy and jobs is wrong. Until now, that is.

Grasping at False Straws

The US economy is still in bad shape, with the unemployment rate still hovering around 10%. Various stimulus measures and tax cuts are being implemented with the expectation that jobs will be created and people will commence with buying enough stuff to right the economic ship. Several articles have appeared recently touting the ability of alternative energy technologies to create jobs, with the intent of continuing the flow of stimulus money and subsidies (1-8). The prominent message is that these technologies not only provide energy with lower environmental impact, but also that subsidizing them is not a drain on the economy because they create jobs. In fact, in almost all of these publications, it is claimed that more jobs are created per unit of energy delivered than from fossil fuels.

The Worldwatch Institute has taken aim at the coal industry and its reported failure to employ enough people:

Coal Industry Hands Out Pink Slips While Green Collar Jobs Take Off

> A transition to renewable energy sources promises significant global job gains at a time when the coal industry has been hemorrhaging jobs for years...
>
> "Government officials now have yet another reason to put the full weight of their support behind renewables," said Renner. "In addition to protecting our planet and phasing out an increasingly limited resource, policies that support renewable energy also support job creation."

There are problems with this particular assessment, but the bigger issue is that the very premise is wrong. Quite simply, it is a mistake to view prodigious job creation as a beneficial side-effect; it is rather a direct result of it being a more expensive way to procure energy.

The Energy Consumer Pays For Energy Jobs

Consider the following: you heat your home by burning wood, and (since the chore is beneath you) you elect to pay somebody to bring you the firewood. One vendor asks for a certain price, saying the task will require two employees and he needs to pay each a good wage. Another vendor, though, says he needs ten well-paid employees to bring you the same amount of wood. Question: will the second vendor quote you a higher or lower price? The answer should be obvious, but perhaps a simpler form of the question is this:

Where does the money come from to pay for the salaries of all of the extra job holders?

If jobs are said to be created, then the money to pay for those jobs has to come from somewhere. If it electricity that is being delivered, than it is the consumers that are paying. If the electricity is subsidized, then everybody is paying through higher taxes. But by focusing on only one side of the coin long enough, by stressing job creation, this simple economic fact has been forgotten.

Returning to the Worldwatch release:

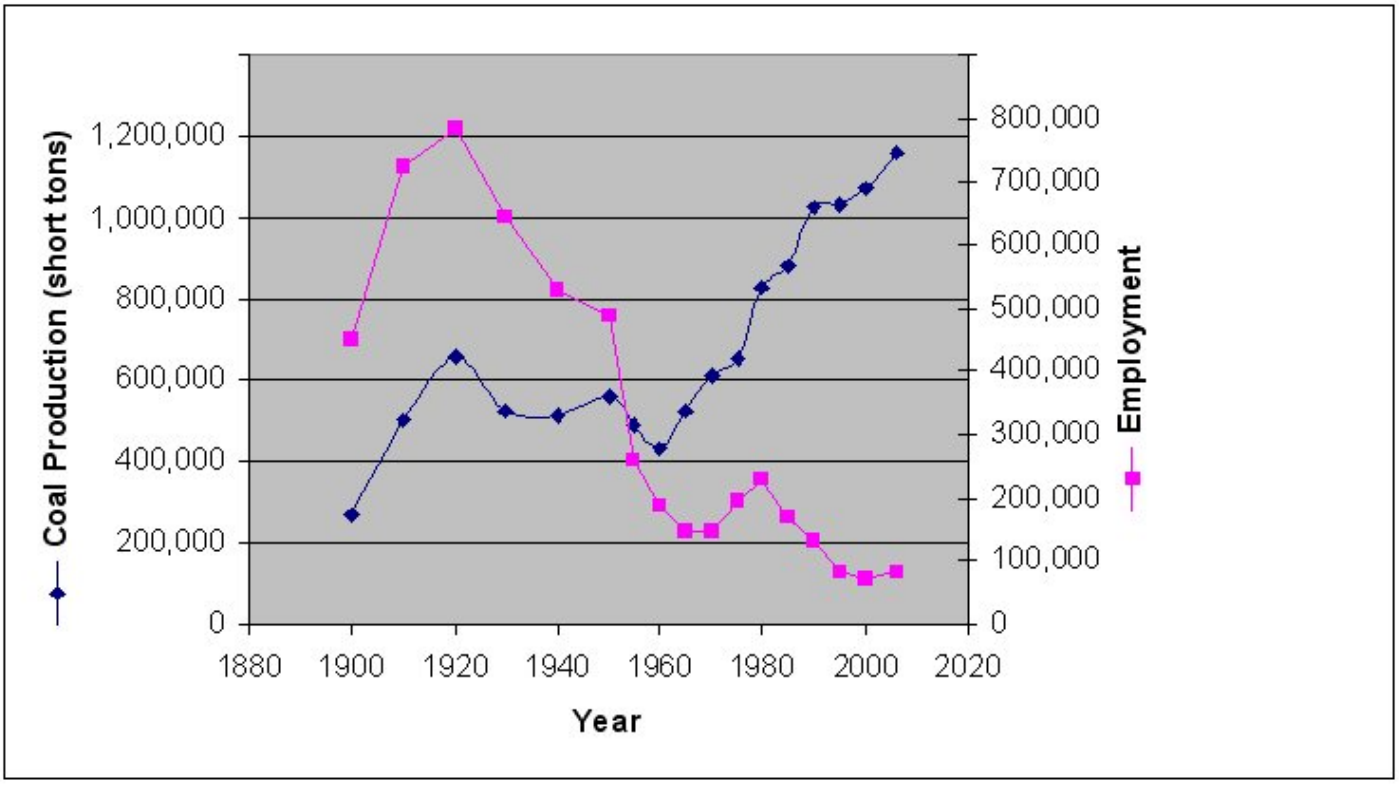
> In the United States alone, coal industry employment has fallen by half in the last 20 years, despite a one-third increase in production.
>
> "Renewables are poised to tackle our energy crisis and create millions of new jobs worldwide," according to Worldwatch Senior Researcher Michael Renner. "Meanwhile, fossil fuel jobs are increasingly becoming fossils themselves, as coal mining communities and others worry about their livelihoods."

Production has increased by a third, but employment is down by one half. First of all, is this true?

Some data on coal employment is available here.

> Average coal power plant employment has fallen dramatically over the past few decades - both due to technological developments and to rising labor costs. In 1985, according to the EIA, the average 300 MW coal-fired power plant had 78 employees; thus, employment per megawatt declined by 32% between 1985 and 1997.

As the graph below indicates, the number of people mining coal has drastically fallen over the last 90 years while production has steadily risen. But aside from the affected communities, is the fact that fewer people have to do dangerous work underground really a bad thing? Certainly not.



U.S. Coal Mining Employment

The document linked above also provides the following datum:

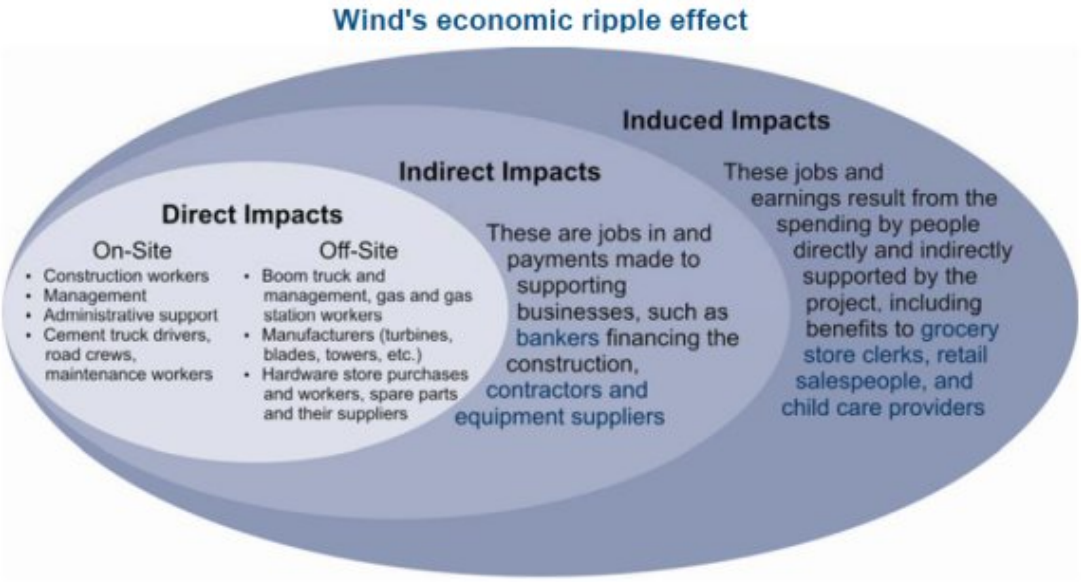
> Wind industry jobs surpassed coal mining jobs in 2008, as wind employment increased by 70% from 50,000 in 2007 to 85,000 in 2008.

Taken at face value, this should really give one pause. In 2009 in the US, according to the EIA, 1719 billion kilowatt hours of electricity was generated by burning coal and 71 billion kilowatt hours was generated by wind turbines. So something which contributes 1/24th as much electricity takes more people to do it? Well, not really, because the coal doesn't magically turn to electricity when it is out of the ground. And although people aren't doing as much digging, machinery has taken up the slack. Machines are more efficient, but someone has to build them. One of the references cited seems to address this, but then it veers offtrack:

> Wind and PV offer 40% more jobs per dollar than coal. And while the labor intensity for renewables may drop due to economies of scale and technological change, sharp declines in coal mining should continue, cutting the average labor requirements to fuel and operate coal power plants by 17% from 1998 to 2008 alone.

The only way to get more jobs per dollar is to have fewer dollars per job (lower salaries). But it is more likely the case that the analysis didn't follow the money far enough up the supply chain. By way of contrast, similar analyses for alternative energy strive to account for every conceivable job. For example, the American Wind Energy Association has produced a document titled 20% Wind Energy by 2030 Report. The economic impact of this plan are given in Appendix C: Wind-Related Jobs and Economic Development. They used an economic impact model derived by the National Renewable Energy Laboratory to estimate jobs created. Much depends on the

assumptions, of course, but this useful extracted diagram shows how building and operating the wind turbines "ripples" through the economy:

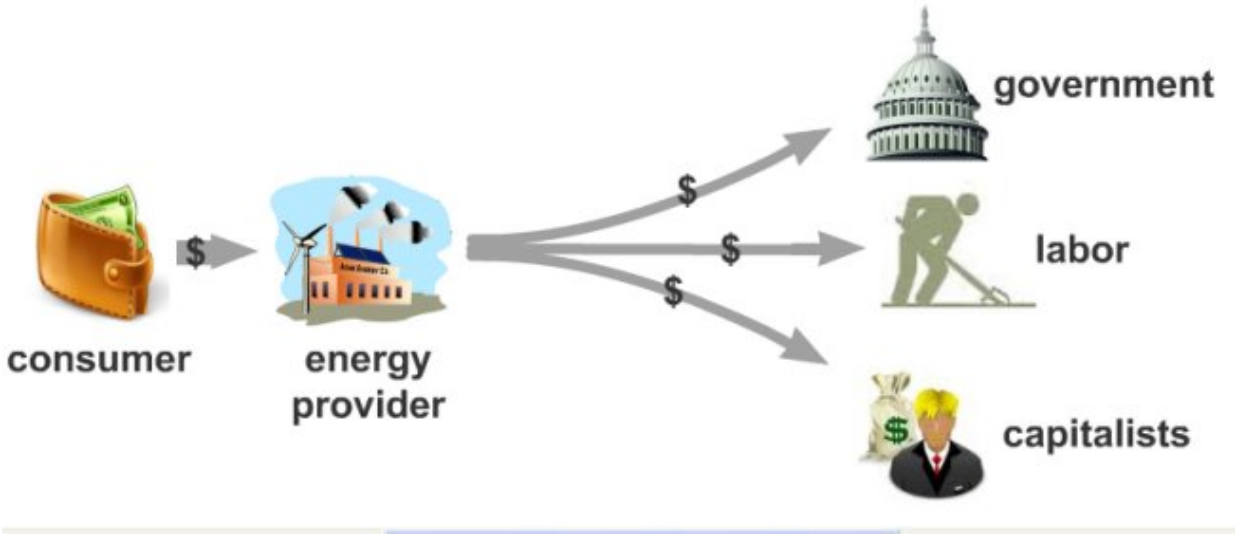


Product Costs Are Predominantly Labor Costs

The above particular model enumerates three categories of impacts: direct, indirect, and induced. There are several points I wish to make about this:

1. All economic impacts are primarily expenditures on labor, since every manufactured product or service is, in the end, someone paid to perform a task -- be it digging a hole, driving a truck, or pushing a pencil.
2. The remaining money flows to capitalists expecting a return on their investment. Thus, the cost of the energy must cover the salaries for all the people slaving at the "created" jobs plus the investment returns for those letting their money work for them. Otherwise, somebody in the product chain is losing money.
3. Adding in the concept of "induced impacts" is unnecessary. It has nothing directly to do with what is required to create the product (energy), is especially difficult to quantify, and is not unique to any particular industry (i.e. all workers will spend their paychecks somewhere). It is useful in gauging impacts to a specific locale of locating an industry there, but not in comparing different energy technologies.
4. Government can act to either increase the cost to consumers, by imposing a tax somewhere on the production side or at the sale, or to decrease the cost via subsidies or tax breaks paid to businesses or directly to consumers.

This is further illustrated with the diagram below.



Where your energy payments go

The above shows how the money flows from the pocket of an energy consumer to those involved with delivering that energy. The amount paid must cover labor costs, pay back bankers and other capitalists, and (usually) give the government a share (directly or indirectly). Note that this represents the state of affairs after the energy is being delivered. Initially, money flows from capitalists (and sometimes government) into labor to perform tasks such as building power plants, wind turbines, or solar cells and exploring and drilling for petroleum. The capitalists expect to get that money back and more over time. As is the case currently, governments can provide capital for start-up or otherwise provide subsequent tax breaks to get the capitalists more excited about opening up their pockets.

Again, the main point is that a direct relationship exists between the amount of money that gets paid for labor (i.e. the number of jobs). If something requires a lot more labor (more jobs), somebody has to pay. If the consumer isn't paying directly, then they are paying through the government subsidy. Capitalists will only pay if there is a good chance that much more lucrative days are ahead.

Externalities = More Jobs!

Coal is burned to generate electricity because it is cheap. Some would argue that its cheapness is in part due to externalities, such as environmental degradation, which are not accounted for in the price consumers pay. In a very real sense, not having to compensate for these does give coal and other fossil fuels an unfair economic advantage over wind and solar. Political approaches such as a tax on CO_2 emissions would level the field, but they would also increase costs for consumers. A more direct approach would be to force the polluters to clean up. Of course, this is done currently to some extent, as coal-fired plants have to follow increasingly stringent emissions limits and those leveling mountains to extract the coal are required to perform some remediation. Mitigating CO_2 release is a logical extension of this. A while ago, I received an email announcing an upcoming conference by the Society of Petroleum Engineers: The First SPE International Conference on CO2 Capture, Storage, and Utilization.

> Watch the video interview of conference cochairperson George Koperna as he discusses the commercial possibilities of CO2 sequestration and storage, which could give the economy a tremendous boost when thinking about the numbers of wells that may need to be drilled and the existing wells that may require workover.

In the video in the above link, Koperna also says "You're looking at very large capital outlays, very large development projects." Sounds expensive. Lots of jobs, most likely.

Do Jobs Matter?

I am not suggesting that job creation is unimportant. Certainly on a local level, new sources of jobs can create new communities or revitalize older ones. If the product which results from the employees' labor is exported out of the community, money is brought in in the form of wages and perhaps local taxes. The same is true at the state or national level. But the continuing mantra of job creation über alles has obscured simple arithmetic, which is that the total labor costs for a particular product (including indirect labor needed for capital equipment and other inputs) must be reflected in the price paid by the consumer.

One of the challenges in the 20th century was dealing with the disappearance of jobs as a result of increases in productivity. For example, fewer people were needed on farms to provide the same amount of food, and assembly-line production of goods enabled fewer to build more for less. So what to do with the unsettled masses? In a previous post on The Oil Drum, The Century of the Self(less)?, Nate Hagens pointed to an excellent video (The Century of the Self) explaining the creation of the consumer society in which the employment problem was solved by putting people to work making things that they didn't before know they really needed. Of course, all this was possible because energy could be obtained without needing as many workers.

So, might we be better off having to devote more of the workforce to the task of obtaining energy? Well, that would slow things down. In fact, it might be an unavoidable consequence of society running short of cheap energy. The previous century was built on readily accessible deposits of fossil fuels, and despite technological improvements, deposits yet to be exploited or discovered will require more effort for the same return. But we should at least be honest about what is happening. And in evaluating alternatives, we shouldn't be ignorant about what "more jobs" means. Making policy decisions based on which alternative creates the most jobs might be politically expedient and perhaps socially necessary, but there is a real cost to society.

Appendix A: How to Create a Million Clean Energy Jobs

Easy. Pay a million people to ride stationary bicycles connected to generators. Not a lot of power, though. And probably very expensive unless you subsidize it.

References

1. American Petroleum Institute Report
2. Nuclear Energy and Job Creation
3. Green Jobs Through Geothermal Energy
4. Jobs More Important Than Price Per Watt to Key Policy Makers
5. Campus Researchers Predict Benefits of Clean Energy Bill
6. Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century, Roger Bezdek, American Solar Energy Society, 2007.
7. Virinder Singh & Jeffrey Fehrs, The Work That Goes Into Renewable Energy, Renewable Energy Policy Project, 2001, p. 26.
8. Grist: Time to move like the wind to save clean energy

SOME RIGHTS RESERVED This work is licensed under a Creative Commons Attribution-Share Alike 3.0 United States License.