

## **Energy Independence: Renewable & Traditional Sources**

Energy independence is a viable and achievable goal for the United States. The abundant sources of natural gas combined with growing renewable energy technology are the current stepping stones that could lead the United States to energy independence. However, neither resource will get us there on its own. The key to successful energy independence in the United States is the exploitation of traditional energy sources the US currently has now while continuing to fund and advance renewable energy sources.

The two most abundant sources of non-renewable energy the United States currently has are natural gas and coal. The oil revenues stood at an estimated 143 million barrels in 2003<sup>1</sup> while natural gas reserves were estimated at 1,338 trillion cubic feet<sup>2</sup> and coal reserves were estimated around 286 billion tons<sup>3</sup>. Since 2003 the estimated reserves of natural gas have risen, as new technology has become available. The estimated reserves for natural gas for 2014 are 2,543 trillion cubic feet according to the EIA<sup>4</sup>. Natural gas is currently being marketed as the answer to the energy supply question. It is abundant, relatively cheap, and its extraction is an understood process. Although natural gas is not without its flaws. Methane is a greenhouse gas and the extraction process is fraught with worry over contaminated water supplies. However, by working with renewable technology and improving the waste water problem of hydraulic fracturing, natural gas can play a large role in the energy independence of the United States.

The largest flaw in natural gas are the issues of what to do with waste water and how to keep surrounding water supplies from becoming contaminated. The simple answer is to stop drilling and work on a solution before starting to drill again. Unfortunately, business doesn't work like that. Instead, an industry can crop up around the problem. Small scale water treatment facilities could service all the wells within a certain distance of the facility. Waste water would arrive at the facility, be cleaned of heavy metals and other contaminants, and be returned to the site. This small scale approach would save CO<sub>2</sub> emissions from taking the water far away from the site to be cleaned and returning it the same distance to either be used again or returned to the local water supply. This solution would put local citizens to work and retain the health of the local ecosystem and water supply.

The renewable energy market is quickly growing in size and popularity as Americans are seeing ever rising costs on electricity and heating. Environmentalism is also on the rise as global warming continues to threaten the planet. This leads us to the second part of the energy independence solution for the United States. Renewable energy sources and technology will play a large role in the overall energy solution the United States, and the world, will utilize as traditional fossil fuel sources continue to become less abundant. Renewable energy sources include hydropower, biomass, wind, geothermal, and solar power. Hydropower and wind turbines provide a large amount of the current generated power from renewable sources, with 51.51% being generated by hydro<sup>5</sup> and 32.09% by wind in 2013<sup>6</sup>. Biomass and geothermal generated a combined 14.62%<sup>6</sup> of the rest of the electricity generated from renewable sources in 2013. That leaves solar with only 1.78%<sup>6B</sup> of the renewable electricity generated in 2013. Solar power is surprisingly under-utilized to generate electricity. Investing in solar power technology and solar power installation nationwide, especially on the industrial scale, will be vital to achieving energy independence.

Renewable energy is a wonderful option in US energy plans because of the clean environmentally friendly aspect. However, funding the technology to advance renewable energy sources will come at a cost to either the industry or the government. There are many tax credits and incentives for solar panel installation. The funding for research and widespread use of the technologies isn't quite to the level necessary to see real change.

There are many business opportunities in developing renewable energy technologies. However, an opening niche is the collaboration between traditional energy sources and renewable energy technology. By combining the two industries the current ability to generate electricity, and profit, through fossil fuels can fund the research needed to advance renewable energy to the point of being a viable, widespread energy solution for the United States. The natural gas industry could invest in solar power by combining the strengths of both industries. Solar power is only viable while the sun is providing energy and when the power generated can be stored for later use. Natural gas is abundant and available constantly on demand. While these industries remain separate, they compete against each other. The growing supply of natural gas has driven down the price to a level that is out competing solar power. Thus the demand for solar power has fallen as consumers turn to natural gas. This leaves the solar power industry

unable to make a profit to fund their research and make their products more efficient. When the two industries are combined natural gas profits are available to fund the research and implementation of solar power. The solar power would eventually be used whenever weather is cooperating and natural gas would be used as supplemental power during those times.

This is just one of many possible combinations in the energy industry. The far reaching point of this suggestion is to combine the industries that would otherwise work against each other to work towards the common goal of energy independence in the United States.

This course of action is already being considered by both sides of the energy industry. The renewable energy industry, specifically solar panel manufactures and installers, see a future where every home and business has solar panels that use back up natural gas to power through downtimes in solar activity. Dave Strenski of Solar Ypsi had this to say on the subject, "I'm hopeful that solar/wind can partner with gas and make a reliable energy source, using renewable sources as the bulk of the power and gas to dynamically pick up the slack when the sun sets or the wind drops."<sup>7</sup>. The natural gas industry is also interested in and already implementing this solution. Shell group is combining the clean energy of solar and wind with the reliability of fossil fuels, mostly natural gas, in hybrid power plants. Concentrated solar power is used to power steam turbines alongside natural gas. This lessens the amount of natural gas needed to produce to same amount of electricity<sup>8</sup>. They have already implemented this in the largest fossil fuel plant in America. "For example, Florida Power & Light operates a 3,722-megawatt natural gas facility in Martin County. In 2011, the company added a 75-megawatt solar plant to the operation. The plant already recycled heat from its systems to help generate steam for producing power. Now the concentrated solar system of parabolic mirrors also contributes heat to make steam."<sup>8</sup>

In conclusion, energy independence is possible for the United States. It would require the exploitation of our natural resources coupled with tandem aggressive funding and research for renewable energy sources and their technology. This is already being done across the country however, it is needed on a much larger scale. The continued exploitation of natural gas offers business opportunity in the form of waste water treatment facilities. The growth of the renewable energy industry will provide many jobs across all education levels from engineering positions to installation and maintenance crews.

## References:

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