



What's Going On With Renewables?

"The Stone Age did not end because we ran out of stone; the oil age will not end because we run out of oil." Sheikh Ahmed Zaki Yamani, former Saudi oil minister.

Renewables are now big business and an ever increasing part of our energy supply comes from wind, solar, and other forms of renewable energy. Solar and wind energy costs continue to drop, making them more competitive with coal, nuclear, gas, and other sources. A variety of tax incentives and subsidies have helped spur the growth of renewables, but many of them are expiring or under threat from Republicans in Congress. Fierce opposition from lawmakers aligned with the fossil fuel industry is one of the biggest challenges faced by renewables today.¹ Others include cost (though this is coming down steadily) and large scale energy storage for when the wind doesn't blow and the sun doesn't shine (there are some interesting developments in this area). If we want a truly clean energy future, we must support renewables to help bring down their cost *while making the natural gas industry pay the true costs of fracking in order to bring their costs up*. The sooner the cost curves intersect and renewables are at parity, the sooner we'll have an energy economy that is sustainable and makes sense.

Juan Cole, a professor at the University of Michigan and a prominent blogger, recently wrote a piece on the top ten reasons why fracking soon won't make *economic* sense, primarily because of the decreasing costs of renewables.²

Wind

The wind industry supports more than 75,000 American-jobs. The world now gets 2.5% of its power from wind (197 Gigawatts). China and the U.S. lead in installed capacity, but by percentage, the leaders are Denmark, which gets 21% of its power from wind; Portugal (18%); Spain (16%); and Germany (9%). In China, wind contributed 1.2 % of overall electricity supply, while in the U.S., wind's share reached about 2% in 2011.³ Wind is on the verge of becoming a major source of energy around the world, and one of

¹ "The Guardian Exposes Fossil Funded Groups Coordinating Renewable Energy Attacks," by Steve Horn, in DeSmogBlog, May 8, 2012 <http://desmogblog.com/guardian-exposes-fossil-funded-groups-coordinating-renewable-energy-attacks>

² "Ten Reasons Why Fracking is Doomed," by Prof. Juan Cole, in Oilprice.com, July 26, 2012 <http://oilprice.com/Energy/General/Ten-Reasons-Why-Fracking-is-Doomed.html>

³ <http://cleantechnica.com/world-wind-power/>

the cheapest, and technology will only continue to improve. The Production Tax Credit (PTC), which gives tax incentives for U.S. wind turbine manufacturers, has contributed significantly to the rapid growth of wind power in the U.S. The PTC will expire at the end of 2012, unless Congress renews it.⁴

Solar

Fossil fuel interests would have you believe that the Solyndra bankruptcy in August 2011 indicates declining demand for solar, but don't be fooled. Solyndra failed due to a dramatic drop in silicon prices (caused by massive production in China), which led to a drop in traditional solar panel prices, putting Solyndra and some other U.S. manufacturers, who were betting on a competing technology, out of business.

In fact, the U.S. solar market grew 109 percent from 2010 to 2011 and will grow another 75 percent from 2011 to 2012. The solar energy industry was the *fastest-growing* industry in the U.S. in 2010, creating jobs 10 times faster than the U.S. economy as a whole.⁵ Strong growth will probably continue in 2012, followed by a dip in 2013 due to changes in state tax credits and a new tariff on imported Chinese panels. Experts expect growth to pick up again after 2013 and anticipate a continuing drop in the cost of solar panels as technology improves, leading to ever wider adoption. Solar is already cost competitive in some markets and is expected to match coal, nuclear and gas in the next three to five years. If you consider how long it takes to bring a coal or nuclear plant on line compared to solar, even without factoring in the terrible secondary costs of coal in terms of health and environmental impacts and the costs involved with the storage and disposal of nuclear waste, solar plants are already cheaper than coal and nuclear in some markets. And even though gas is currently very cheap, the price of solar modules has been dropping faster than was anticipated even a few years ago and solar is expected to become cheaper than gas as soon as 2016.⁶

Also, the price of solar can be locked in for utilities in long term contracts at set rates. Right now, the price of natural gas in the U.S. is one fifth of what it is internationally, but prices here are expected to rise once we start exporting more natural gas to foreign markets.⁷

⁴ The "Power of Wind" web site has a web-based petition to Congress asking for the extension of the PTC: http://www.powerofwind.com/action-center/action/save-usa-wind-jobs_1

⁵ Solar Power summary, cleantechnica.com, June 2012 <http://cleantechnica.com/solar-power/>

⁶ "Brave new world as solar PV heads to 50c/watt," by Giles Parkinson, in Reneweconomy.com, July 20, 2012 <http://reneweconomy.com.au/2012/brave-new-world-as-solar-pv-heads-to-50cwatt-29404>

⁷ "Green Energy May Yet Survive Poison of Cheap Gas," by Christopher Swann, in Slate.com, April 13, 2012 http://www.slate.com/blogs/breakingviews/2012/04/13/cheap_natural_gas_prices_not_a_death_knell_for_green_energy.html

Like wind, solar is now big business with a lot of large players. One company betting on solar in a big way is GE, which started construction on a new plant in Colorado, due to open this year, that will pump out a new thin film panel *every ten seconds*.⁸

Energy Storage

One of the major challenges for both wind and solar remains large scale energy storage to provide a consistent flow of power on demand at times when there's little sun or wind available for power generation. Most research continues to focus on improving the efficiency of Lithium ion batteries (the batteries in laptops) to make them cheaper and increase their capacity. A123⁹ and Envia¹⁰ both claim recent advances.¹¹

Researchers at MIT have developed a liquid metal battery for very cheap, large scale energy storage and have founded Liquid Metal Battery Corporation to commercialize the new, very promising, technology.¹² Other energy storage solutions include batteries for individual homes (Panasonic has these in development) and even systems using compressed air, among others.

Biofuels

Biofuels are: first generation fuels derived directly from plants such as corn or soy; second generation fuels from biomass, such as ethanol from cellulose; and third generation fuels derived from bio-engineered microbes such as algae. The federal government has had big plans for cellulosic ethanol, setting aggressive targets for its production for the past several years, but because of cost challenges and technological issues, the industry remains far behind schedule on these targets. The industry has made exciting progress however, in the development of new feedstocks for biofuels. Several companies are leveraging **miscanthus**, a fast growing grass that farmers need to plant only once, but can harvest year after year. Repreve Renewables¹³ is a major miscanthus supplier. Other companies are leveraging **Camelina** as a first generation crop that can produce jet fuel. It can be raised sustainably in rotation with wheat so that it doesn't compete with our food supply.

Cool Planet,¹⁴ a company backed by Google, GE, BP, and ConocoPhillips, has a proven process that converts biomass to pump-compatible gasoline with no intermediate processes *in an hour*. The process also can create a carbon rich substance that restores nutrients to the soil. The company anticipates that within two years they will start

⁸ "GE's new factory will push out one solar panel every ten seconds," by Daniel Cooper, in Engadget.com, October 17, 2011

<http://www.engadget.com/2011/10/17/ges-new-factory-will-push-out-one-solar-panel-every-ten-seconds/>

⁹ www.a123systems.com/

¹⁰ enviasystems.com/

¹¹ "Batteries for Energy Storage: New Developments Promise Grid Flexibility and Stability," by Tildy Bayar, *Renewable Energy World* magazine, August 30, 2011

<http://www.renewableenergyworld.com/rea/news/article/2011/08/batteries-for-energy-storage-new-developments-promise-grid-flexibility-and-stability>

¹² lmbcorporation.com

¹³ www.repreverenewables.com

¹⁴ www.coolplanetbiofuels.com

producing portable conversion units that would fit in cargo containers for transport to biomass rich sites, where they would be set up as mini gas refineries using only the biomass as raw material.

Several companies now either are producing biodiesel from algae in commercial quantities or are working on commercial scale plants (see Solazyme¹⁵ and Sapphire Energy¹⁶). At least two other companies (Algenol Biofuels¹⁷ and Joule¹⁸) have developed microbes that excrete ethanol and biodiesel on a continuous basis without actually harvesting the algae to extract the oil or ethanol. Joule approximates the cost of their oil will come in at about \$20 a barrel once the technology is fully commercialized.

Major oil companies, including Chevron and BP, are investing heavily in biofuels, as is the U.S. military, which sees renewable fuels as alternatives to foreign oil and therefore an imperative for our national security. Many short-sighted Republicans in Congress have been pushing hard to put an end to this government expenditure.¹⁹

How can you help?

Federal Level: Contact your U.S. Senators and Representative and ask them to:

- Support extension of the Production Tax Credit for wind power (the Sierra Club has a Wind Works campaign for this: www.sierraclub.org/windworks);
- Support subsidies to help keep renewables cost-competitive until they can compete on their own with dirty fossil fuels and nuclear power;
- Support research into battery technology so that the renewables industry can reach its full potential; and
- Continue the military's investments in biofuels, so that we can develop a cost effective alternative to fossil fuels.

Senator Chuck Schumer

Phone: 202-224-6542

Email: www.schumer.senate.gov/Public/contact.htm

Senator Kirsten Gillibrand

Phone: 202-224-4451

Email: www.gillibrand.senate.gov/contact/

Find your Representative: www.house.gov/representatives/find/

¹⁵ solazyme.com

¹⁶ <http://www.sapphireenergy.com>

¹⁷ www.algenolbiofuels.com

¹⁸ www.jouleunlimited.com

¹⁹ "US Navy defends 'great green fleet' from Republican attacks," by Suzanne Goldenberg, in TheGuardian.com, July 20, 2012

<http://www.guardian.co.uk/environment/2012/jul/20/us-navy-great-green-fleet-republicans>

State Level: Tell your elected officials in Albany to support subsidies for renewables in general and help move New York away from all fossil fuels and nuclear.

Governor Andrew M. Cuomo

By Email: www.governor.ny.gov/contact/GovernorContactForm.php

By Phone: 518-474-8390

Find your State Senator: <http://www.nysenate.gov/senators/>

Find your State Assembly member: <http://assembly.state.ny.us/mem/?sh=search>

Also, if you would like to have your residential power supplied by renewable energy instead of dirty sources like coal, gas, or nuclear, you can elect to do so by visiting this web site: www.greenpowernyc.com

For more information or to connect via social media:

Wind energy

<http://cleantechnica.com/world-wind-power/>

<http://cleantechnica.com/category/alternative-energy/wind-energy/>

<http://www.awea.org/>

<https://www.facebook.com/AmericanWindEnergyAssociation>

<https://twitter.com/AWEA>

Solar energy

<http://cleantechnica.com/solar-power/>

<http://cleantechnica.com/category/alternative-energy/clean-solar-energy/>

<http://www.solarelectricpower.org/>

<https://www.facebook.com/TheSolarIndustry>

<https://twitter.com/seia>

Energy storage

<http://cleantechnica.com/category/alternative-energy/energy-storage-clean-energy/>

<https://twitter.com/PowerStorageCo>

Biofuels

<http://www.biofuelsdigest.com/bdigest/>

<http://advancedbiofuelsusa.info/>

<http://www.advancedbiofuelsassociation.com/>

<https://www.facebook.com/Advanced.Biofuels.Association>

<https://twitter.com/advancedbiofuel>