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News. July, 2012. Issue #5. 830 ESB [video views](#).

"If you have an apple and I have an apple and we exchange these apples then you and I will still each have one apple. But if you have an idea and I have an idea and we exchange these ideas, then each of us will have two ideas."

George Bernard Shaw.

If you have knowledge, let others light their candles with it.

Margaret Fuller

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<http://energysouldbe.org/subscribe.html>

Ratings for articles and videos: (G = General Audience, PG = Pretty Geeky, VG = Very Geeky).

New ESB Video & Website

We've just released a new one-minute introduction to EnergyShouldBe.org (G).

<http://www.youtube.com/watch?v=AYr06ZBUXoc>

We've also improved our website including a glimpse at some of the more than 20 videos that are "coming soon". (G)

<http://EnergyShouldBe.org/learn.html>

Check these out and let us know what you think.

Electricity

How Much Renewable Electricity Generation is Possible in the US?

Far More Than We Can Use.

The renewable resources available in the US are amazing. Press release (G):

<http://www.nrel.gov/news/press/2012/1948.html>

Report including state-by-state conservative estimates for how much rooftop solar electric, utility-scale solar electric, geothermal, wind, etc. is technically available. (VG):

<http://www.nrel.gov/docs/fy12osti/51946.pdf>

Resource map Powerpoint (VG):

http://www.nrel.gov/gis/docs/resource_maps_201207.pptx

Using the report just above, and the state-by-state electricity sales and peak summer capacity data from the Energy Information Administration (EIA) ...

<http://www.eia.gov/electricity/annual/customersales-map1.cfm>

... we can compare how much renewable electricity is technically possible with how much electricity we are actually using.

For example, in Colorado, just rooftop solar could provide 12 GW of capacity and 16,000 GWh (gigawatts & gigawatt-hours, 1 GW = 1,000 MegaWatts) of electricity generated. This compares to today's 14 GW summer capacity (mostly coal and natural gas) and 53,000 GWh of electricity sales.

So just rooftop solar in Colorado could take the place of most of the capacity (when the sun shines) and 30% of the total electricity used.

If we add in "urban utility scale solar electric" (PV) of 19 GW capacity and 43,000 GWh of generation, rooftop and urban utility scale solar electric generation together can replace way more than the total existing fossil based generation capacity and electricity use (GWh) in Colorado. This is without even needing rural solar electric, wind, or geothermal generation.

Bottom line, there is far more renewable resource technically available than we can possibly use.

US Non-Hydro Renewables Reach 20 Million Megawatt-hours in April

The headline for this article is that natural gas generation and coal generation were equal in April. (a big increase in natural gas and big decrease in coal). This is largely because of low prices for gas. But what I found interesting was the rapid ramp up of non-hydro renewables over the last few years.

While replacing the dirtiest fossil (coal) with a cleaner fossil (gas) is "better", it doesn't get us to "good". Non-hydro renewables move us down the path to what EnergyShouldBe. (PG)

http://www.pennenergy.com/index/power/display/0949521700/articles/pennenergy/power/coal/2012/july/eia-monthly_coal-fired.html

Germany: 26% of Electricity Renewable in First Half of 2012

Over the past year, PV-solar showed the biggest increase (47%) (PG)

http://www.realclearenergy.org/charticles/2012/07/30/germany_26_of_electricity_renewable_106644.html

The article concludes with: *Germany may be able to achieve its goal of eliminating nuclear by 2020. But the road could get much steeper in the future as requirements for huge facilities for energy storage come into play.*

This last comment about large amounts of energy storage is probably overstated until renewables reach the 70 or 75% level. Below 50% renewables our modeling showed no need for battery storage if there is no baseload generation on the grid (see Picturing Electricity Use & Renewables Parts 1 to 3) (PG):

<http://energysouldbe.org/delve.html>

Thurston Public Power on November Ballot

After gathering enough signatures, Thurston County, WA (Olympia) will have a county-wide municipalization (Public Utility District) attempt on their 2012 ballot. Their current electric company, Puget Sound Energy, is another coal-heavy electric utility with rapidly increasing rates. Neighboring Jefferson County, WA, is in the final phases of their electric PUD and is very likely to flip the switch to local control, local jobs, and lower rates. (G)

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

And they have a song too (G)

https://www.youtube.com/watch?feature=player_embedded&v=-DGX5L14sQw

Successful South Carolina Home Electricity Retrofit Program: On-Electric-Bill Financing

The 125 participating households are projected to save an average of more than \$400 per year (after loan payments) by reducing their electricity use an average of 35 percent... The comprehensive energy retrofit approach is projected to yield an average energy savings of more than 11,000 kWh/year per home. Though the average loan was for \$7,200 over a 10-year term, the net financial benefits are expected to be immediate, particularly during energy-intensive summer and winter months. (G)

<http://eesi.org/initial-findings-south-carolinas-help-my-house-pilot-released-20-jul-2012>

Wind: Bigger is Better & 50% Capacity Factor Becoming Normal

While for many things small may be beautiful, for wind, bigger blades mean lower costs, higher efficiency, and greener power (G).

<http://news.nationalgeographic.com/news/energy/2012/07/120720-bigger-wind-turbines-greener-study-says/>

Wind capacity (how much of the year the turbines are actually producing their rated power) has been going up. 10 years ago, 30% capacity was common. Now 40% is common, and 50% capacity factors are becoming common. Much of this increase is due to bigger blades. (G)

<http://cleantechnica.com/2012/07/27/wind-turbine-net-capacity-factor-50-the-new-normal/>

Apples-to-Apples Electricity, etc., Cost Comparisons - NREL Transparent Cost Database.

A very interesting attempt to make apples-to-apples comparisons of renewable and conventional electricity generation, fuels, and electric and not vehicles. Relatively complete data in the electricity generation side to no data for full electric vehicles. Presumably more data to come over the years. Interactively allows changing the year range for the data so you can see trends.

For example, take a look at the LCOE tab (Levelized Cost of Energy - takes into account up-front, operations, and maintenance costs). Note that Wind is the cheapest electricity generation source for the time period 2009 - 2012. Also includes projections for costs into the future using a variety of sources (they are reporting other researchers' projections, not their own) (VG).

<http://en.openei.org/apps/TCDB/>

Transportation

The Best EV: An Airplane?

A NASA/Google competition to get a quiet, fast (100 MPH), 200 mile range, airplane with a remarkable 200 passenger mile per gallon (equivalent) rating has been won by an electric airplane. The gasoline planes just were not as good. And a second electric airplane entrant was also qualified.

Video (G, start at 10:30 and watch until 12:55 - so 2.5 minutes)

<http://www.youtube.com/watch?v=wkJ5836xqTM>

To put this in perspective, a Prius with 4 passengers is a 60 MPH, 200 passenger mile per gallon vehicle.

For a summary of EV airplane prototype efforts (start at the section *Posse of Prototypes*). (PG)

<http://analysis.evupdate.com/commercialization-evs/electric-aircraft-evs-slowly-taking-flight>

For example this personal airplane takes off from water (G).

<http://flynano.com/>

It is very clear from the developing parts of the world that you install wireless cell phones and skip the expense and control issues of monopoly wired phone utilities. There is thin but increasing evidence that you can skip the centralized electric grid (see Bangladesh article in the June ESB News) (G)

http://energysouldbe.org/subscribe_files/Energy_Should_Be_News_June_2012.pdf

Is there a similar analogy for personal transportation? Is there no need for near so many or large freeways if you can have a cost-effective, safe, quiet, airplane for getting around? Clearly we are a long way from this, but even so it makes one wonder.

Green Car Infographic

Clean and clear infographic to explain the different variations of Electric Vehicles, Hybrids, etc. About the only thing it doesn't include is separating PHEVs (plug-in hybrid electric vehicles) into two categories:

- PHEV (like Toyota's plug-in Prius) Drives just like a regular Prius (e.g., drives adequately. but nothing to write home about)

- EREV Extended Range Electric Vehicle (e.g., The Chevy Volt) This is a kind of PHEV but it drives like an all-electric (fast & fun)

(G)

<http://1bog.org/blog/infographic-green-cars-101/>

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