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News. April, 2016. Issue #48. 82,000 ESB video views. *100% Renewable by 2035.*

"No matter which country you're in, the cost of clean energy now is cheaper than the cost of climate change later. Those betting on renewable energy will win big."
- U.S. Secretary of State John Kerry.
http://www.greentechmedia.com/articles/read/5-Quotes-We-Love-from-BNEFs-Future-of-Energy-Summit

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Moving to 100% Renewables

2015 : Worldwide: Renewable Investments Beat Fossils 2 to 1

Recent solar and wind auctions in Mexico and Morocco ended with winning bids from companies that promised to produce electricity at the cheapest rate, from any source, anywhere in the world…

The reason solar-power generation will increasingly dominate: It's a technology, not a fuel. As such, efficiency increases and prices fall as time goes on. What's more, the price of batteries to store solar power when the sun isn't shining is falling in a similarly stunning arc. … Meanwhile, fossil fuels have been getting killed by falling prices and, more recently, declining investment. … The world's first coal superpower, the U.K., now produces less power from coal than it has since at least 1850… (G)
http://www.bloomberg.com/news/articles/2016-04-06/wind-and-solar-are-crushing-fossil-fuels

Why Non-Utility Companies Are Buying So Much Wind?
In 2012, almost no non-utility companies purchased or contracted for wind farms. In 2015, a stunning HALF of all utility scale wind was built for non-utility companies.

The reasons why start with wind electricity being really cheap - in 2014 the average wind contract was for 2.5 cents per kWh. Add on a penny or so for transmission and there is no cheaper electricity to be had. The second reason is that those wind contracts are typically for 20 years and cost increases are contracted for in advance. Corporations love it when costs are mostly fixed and known in advance. The final reason for this change is increasing numbers of companies and institutions have corporate sustainability goals.

Almost all of this development occurs in the parts of the US that have open competitive markets for electricity - that is that are served by Independent transmission System Operators (ISOs) that are not controlled by monopoly electric utilities. While half of the US population is served by ISOs, what about the large swaths of the country that have monopoly transmission systems with no generation competition? Do these states become uncompetitive with the rest of the country when it comes to getting and keeping corporations?

(darker colored areas on map served by ISOs (AKA - Regional Transmission Operators RTO). G)
http://www.isorto.org/about/default

(Study showing 2.5 cents per kWh wind in 2014. PG)
http://newscenter.lbl.gov/2015/08/10/study-finds-that-the-price-of-wind-energy-in-the-united-states-is-at-an-all-time-low-averaging-under-2-5¢kwh

(Articles reporting non-utility companies purchasing wind. G)
http://qz.com/662609/your-web-searches-are-probably-going-to-be-powered-by-wind/
https://www.washingtonpost.com/news/energy-environment/wp/2016/04/12/why-companies-like-google-and-walmart-are-buying-so-much-wind-power

MidAmerican Energy: New Wind Farm Means Iowa Customers Will Be 85% Renewable
MidAmerican has 90% of its customers in Iowa. With a newly announced $3.6 B, 2,000 MW wind project those customers will get the equivalent of 85% of their energy from wind. From a MidAmerican press release:

…and it's being done without asking for an increase in customer rates or financial assistance from the state to pay for it.

"We have a bold vision for our energy future," said Bill Fehrman, CEO and president of MidAmerican Energy. "We don't know of another U.S. energy provider that has staked out this 100 percent position. Our customers want more renewable energy, and we couldn't agree more. Once the project is complete, we will generate wind energy equal to 85 percent of our annual customer sales in Iowa, bringing us within striking distance of our 100 percent renewable vision."

ESB News did a quick analysis of MidAmerican's 10-K filing and verified that the "85 percent" statement is reasonably true. Some notes though… this is for customer sales, not wholesale energy sales. When done they will have wind capacity far above - about 5,400 MW - their peak Iowa load of 4,600 MW. This means they will have excess wind most of the time the wind is blowing. This brings up interesting questions about how they will balance the wind energy and how they will be accounting for sales of the excess wind - sales from wind farms that are being paid for by MidAmerican's Iowa customers. And is MidAmerican double counting those excess wind energy sales (i.e., if the wind is sold to someone else, should MidAmerican be able to count that sold wind in their 85% number)? Iowa is part of the Midcontinent Independent transmission System Operator (MISO). MISO supports a transparent real time market for electricity allowing MidAmerican to easily sell excess. (MidAmerican press release and 10-K form. PG and VG).
https://midamericanenergy.com/news.aspx (click on the 4/14/2016 press release).
http://www.berkshirehathawayenergyco.com/assets/upload/financial-filing/BHE%2012.31.15%20Form%2010-K_FINAL%20_with%20hyperlinks-1.pdf

Transportation

Amusing Video Celebrates the 5th Anniversary of Nissan's Leaf in Japan
…Nissan produced a special version (of the Leaf) that allows people to "see" what the driver is thinking and feeling, using brainwaves that are … projected into words and visuals on the road. (A quirky video. G. 2 minutes.)
https://www.youtube.com/watch?v=ddWx_cI84UM

Research: 20 KW Wireless Charger
Existing wireless chargers charge at about 3 kW - 9 to 12 miles of driving per hour of charging. At 20 kW this charger would provide 60 to 80 miles of driving per hour of charging. Like existing wireless chargers, this charger can be used while the car is parked. This charging technology has also been demonstrated to work dynamically - while the car is moving. (G)
http://www.autoblog.com/2016/04/16/20kw-wireless-charging-range-anxiety/

Energy Storage and Miscellaneous

Research: Graphene & Silicon Battery Technology
Yet another interesting battery technology. (PG)
http://spectrum.ieee.org/nanoclast/semiconductors/materials/potential-of-silicon-and-graphene-together-for-liion-electrodes-realized

Large-Scale Rail-based Electricity Storage Project Gets BLM Approval.
…after a robust Environmental Assessment and Biological Opinion concluded a Finding of No Significant Impact, BLM wrote a Decision and granted the project. BLM approval is a major step forward for building the first project based on this technology. Further down the article provides a nice summary of other non-battery large scale electricity storage projects (G).
http://www.greentechmedia.com/articles/read/First-Grid-Scale-Rail-Energy-Storage-Project-Gets-Environmental-Approval-Fr