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News. May, 2015. Issue #38. 62,000 ESB [video views](#). *100% Renewable by 2035.*

Regarding distributed generation (e.g., rooftop solar):

The problem for utilities is that fighting isn't likely to prove effective in the long run. For one, they're facing a tidal wave of technological innovation (e.g. batteries and microgrids combined with smartphones and distributed computing) and increasingly cost-effective alternatives to utility--provided electricity (e.g. solar). For another, winning this battle means completely alienating their customers.

This means that the utility of the future can't look like the utility of the past or present, but must take a new form to remain relevant in a democratized energy system.

- John Farrell in a great series of articles: [Beyond Utility 2.0](#) (G)
<http://ilsr.org/beyond-utility-2-0-part-2-the-present>

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Moving to 100% Renewables

Stanford University: 65% Renewable by 2017

Most of their electricity will be from on-campus and near-campus solar. Also, they are electrifying cooling and heating systems. This translates into a vast reduction in fossil fuel use. By the end of 2016 Stanford will have 74 MWs of solar installed. (G)

<http://www.stanforddaily.com/2015/05/20/solar-panels-to-make-up-half-of-campus-electricity-supply-by-2017/>

Wind & Solar Make up 100% of New US Electricity Generating Capacity in April

This is the first time this has happened. Furthermore, renewables make up 84% of new US electricity generation so far this year. (G)

<http://www.renewableenergyworld.com/articles/2015/05/wind-and-solar-account-for-100-percent-of-new-us-generating-capacity-in-april.html>

Grid Parity For Solar Electricity Coming Faster Than Expected (G)

http://blog.renewableenergyworld.com/ugc/blogs/2015/05/solar_parity_coming.html

Book: The Great Transition by Lester R. Brown, et al

The energy transition is here... This book is an upbeat look at the economic, social, and environmental trends that are driving the world's quick transition to renewable energy. (G)

<http://www.earth-policy.org/books/tgt>

Supporting facts and summary slides (scroll down a bit). (PG)

http://www.earth-policy.org/books/tgt/tgt_data

Oil Well Geothermal

In some oilfields as much as 7 barrels of hot water are pumped out of the ground for each barrel of crude. Researchers are prototyping systems to convert that hot water into electricity. (G)

<http://www.renewableenergyworld.com/rea/news/article/2015/04/turning-bakken-oil-well-waste-water-into-clean-geothermal-power>

The Leading Solar City? Lancaster, California

They have installed 118 MW of solar within the city limits and expect to have 530 MW of clean energy by 2020. *Hitting that target would make Lancaster one of the world's first net-zero towns, producing more energy on an average day than the city consumes...*

With all their solar ventures, city officials found that it just wasn't that hard. "It was a story more of financing than it was a story of engineering or construction." Article & podcast. (G)

<http://www.ilsr.org/lancaster-the-leading-solar-city-episode-23-of-local-energy-rules>

Transportation

Electrified Garbage Truck Conversions Are Quiet and Much Cheaper to Run and Maintain

The typical diesel garbage truck is noisy, polluting, and because of the constant starts & stops needs to have brakes replaced every 3 months. This startups' conversion kit provides a clean and quiet garbage truck that uses regenerative braking to reuse the energy from stopping. This means that the brakes should last a long time. The company anticipates paybacks in as little as 3 years and installation to be done by existing garbage truck fleet maintenance folk. (G)

<http://www.forbes.com/sites/peterdetwiler/2015/03/04/electric-garbage-trucks-huge-energy-savings-and-they-wont-wake-you-up-in-the-morning/>

Marc Tarpenning - A Tesla founder, moves on to garbage trucks. An excellent energy video. (G)

<https://www.youtube.com/watch?v=EDCYoAQmmAA>

Energy Storage, Etcetera

Tesla Announces Powerwall for Homes, Powerpack for Businesses and Utilities

The Tesla battery is better than I thought for homes. And at utility scale, it's deeply disruptive. (PG)

<http://rameznaam.com/2015/04/30/tesla-powerwall-battery-economics-almost-there>

If you thought Tesla was a car company, think again. It's a battery company that happens to sell cars wrapped around one manifestation of its core product. (G)

<http://venturebeat.com/2015/04/30/tesla-launches-tesla-energy-new-line-of-powerwall-batteries-for-homes-and-businesses/>

What was announced?

The Powerwall for homes comes in two versions - a 10 kWh unit for periodic use. A 7 kWh unit for daily discharge. The units are stackable. Cost to installers of \$3500 and \$3000. The price excludes costs for installation and inverters - an inverter is needed to connect the DC batteries to your AC home electric panels. Note that there are solar inverters that interface with battery systems so it will make sense to install Powerwalls with solar PV.

The Powerpack is a group-able 100 kWh unit - buy as many units as needed. (G)

<http://www.teslamotors.com/presskit>

The cost for the Powerpack for utilities and larger business installations is expected to be \$250/kWh. (G) (more on \$250/kWh below)

<https://twitter.com/elonmusk/status/594186544174366720>

Why are these products important?

Elon's announcement video does a pretty good job of explaining the product and its importance. (18 minutes) (G)

<https://www.youtube.com/watch?v=yKORsrIN-2k&sns=tw>

More analysis on the products. (G)

<http://www.utilitydive.com/news/all-you-need-to-know-about-teslas-big-battery-announcement/393175/>

Why is \$250/kWh disruptive?

Many analysts (including me) view that around \$250/kWh energy storage will seriously disrupt the electric utility and generation industries. For example, one study in Texas expected \$350/kWh batteries by 2020, and that that price would cost-competitively drive a phenomenal 15 GWh (15,000 MWh) of battery storage installs. Tesla will begin delivering Powerpacks at \$250/kWh this year - 5 years early, and \$100/kWh less, than the six-month-old study anticipated.

Tesla is quite clear that their 50 GWh/year Gigafactory is only the first of many to come. (PG)

http://www.brattle.com/system/news/pdfs/000/000/749/original/The_Value_of_Distributed_Electricity_Storage_in_Texas.pdf