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News. August, 2015. Issue #41. 68,000 ESB [video views](#). *100% Renewable by 2035.*

*Never interrupt someone doing something you said couldn't be done.
-- Amelia Earhart. Aviator*

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Moving to 100% Renewables

How Much Good Solar Can Go on My Roof? Solar Rooftop Maps Tell Us.

City of Boulder, and separately, Google, Announce New Solar Maps

Start with detailed ground images and data. Figure out what is a roof and what is not. Use 3D modeling and factor in shading from trees and structures. Put this together and you can see how much solar your roof can generate while avoiding shady areas - that is, how much good, or high-yield solar you can have.

Both of these mapping efforts are amazing.

Google's Sunroof uses their satellite imagery for the San Francisco Bay Area, Fresno, CA, and Boston, MA to give you an estimate of your rooftop solar. We hope Google expands this to all cities and the whole world.

Boulder's effort is based on LIDAR data the city already had. LIDAR gives a very precise look at elevations and can be used to calculate roof facing and pitch - important for figuring out solar generation. LIDAR also "sees" the trees and allows estimating the impact of shading.

Both maps allow you to select a single roof and calculate generation, cost-estimates, and the value of your solar generation whether you lease, borrow, or outright buy the system.

The Boulder map allows you to select a small area of your roof and figure out generation for just that area. Boulder also provides a summary of how much solar can be installed in the entire city (see next article).

Google's Sunroof links: about the maps then a random home in Fresno. (both G)

<https://www.google.com/get/sunroof/about/>

<https://www.google.com/get/sunroof#a=4450%20North%20Teilman%20Avenue%2C%20Fresno%2C%20CA%2C%20United%20States&b=125&f=buy&np=20&p=1>

Boulder's Map. (G)

<http://www.mapdwell.com/en/boulder>

Boulder, CO: 550 MW of "Good" Solar Rooftop Space

Once you have good rooftop solar maps (see previous article), you can add up how much high-yield solar can be installed inside of a city. Part of Boulder's mapping effort did just that. The answer: 550 MW or about 55% of our total annual electricity usage with today's PV technology.

Combine this with electricity storage, and it becomes clear the potent threat that rooftop solar is to traditional monopoly vertically-integrated utilities. No electric utility that owns its own generation can survive if 60% of its electricity sales disappear. And, historically, monopolies perish when effective competition becomes available. Click on the link that says "Full Stats" near the upper left corner of:

<http://www.mapdwell.com/en/boulder>

Japan Installs World's Largest Floating Wind Turbine

This is a truly enormous offshore wind turbine - 7 MW and 344' tall. It can handle waves up to 65' high. Use of floating wind turbines opens up vast areas of near-shore ocean to wind development - places where the water is too deep to install seabed wind turbine foundations. This is one of the very first floating full-size utility-scale turbines. (G)

http://www.upi.com/Top_News/World-News/2015/08/03/Japan-installs-worlds-largest-floating-wind-turbine-to-offset-Fukushima-loss/2851438605250/

Ameren Missouri Scraps Nuclear Power Plant Citing Falling Costs of Renewables

Like all baseload power plants, nuclear power is technically incompatible with lots of renewables. Our 3-minute video (link below) explains why.

Now, in addition to the technical issues, new renewable power is just plain cheaper than new nuclear power. Video on the technical issue, then the article on the scrapped nuclear plant.

(Both G)

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

<http://www.powermag.com/ameren-scraps-planned-missouri-nuclear-unit-cites-falling-renewable-costs>

WattTime is it? Time to Charge Your Car!

JuiceBox Green Automatically Provides the Flexibility To Use Renewable Electricity.

As ESB has noted many times, the biggest issue with lots of renewables is not that generation varies with the sun and wind, but that there are times when there is too much renewable electricity all at once. WattTime and JuiceBox Green have collaborated on an electric vehicle charger that charges your car when there is lots of wind or solar. This allows more renewables to be brought onto the grid and minimizes greenhouse gas emissions.

For now this is limited to the few areas of the country where realtime generation data is available. Let's hope utilities quickly move to make this data available worldwide. (G)
<http://www.greentechmedia.com/articles/read/watttime-pinpoints-the-greenest-grid-power>

And how much money might that flexibility save? (see next article)

RMI: Flexiwatts Could Save Customers and Utilities \$ Billions

In the previous article WattTime and JuiceBox provide the technology to flexibly use renewables. In this article, RMI analyzes the cost savings for both customers and utilities. (PG)
<http://www.renewableenergyworld.com/articles/2015/08/rocky-mountain-institute-flexiwatts-save-customers-utilities-billions.html>

Research: Treat Sewage, Capture Carbon, and Generate Hydrogen

Cleaning up municipal and industrial wastewater can be dirty business, but engineers at the University of Colorado Boulder have developed an innovative wastewater treatment process that not only mitigates carbon dioxide (CO2) emissions, but actively captures greenhouse gases as well. (PG)

<http://www.alternet.org/environment/amazing-new-process-treats-wastewater-captures-carbon-and-producing-renewable-energy>

Energy Storage, Etcetera

Research: 8 Potential Battery Breakthroughs

A variety of interesting approaches for packing electricity into smaller & longer-lived spaces have been announced in the last quarter. Some of the descriptions: “*pumpkin-shaped molecules ... in a honeycomb-like structure;*” “*coating silicon cathodes with high-crystal graphene to almost double the capacity;*” “*polymers and nano-scale fullerenes arranged ... (like)... ‘small bundles of uncooked spaghetti with precisely placed meatballs’;*” and, “*an elastic, foam-like battery material that can withstand shock and stress*” made from wood pulp. (PG)

<http://www.greentechmedia.com/articles/read/Eight-Potential-Battery-Breakthroughs>