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News. July, 2015. Issue #40. 66,000 ESB [video views](#). *100% Renewable by 2035.*

A wind turbine is just an oil well turned upside down.

- Bill Miller. Head of Anschutz's Oil & Gas Business
(See the first article below)

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Moving to 100% Renewables

Conservative Billionaire to Build 3,000 MW Wind Farm on His Wyoming Ranch

Philip Anschutz, who built his fortune on oil drilling, has a plan to build a 3,000-megawatt wind farm on his 500-square-mile cattle ranch in Wyoming... the project would produce four times more electricity than the Hoover Dam... the construction phase of the first 500 turbines would take up to two years... “A wind turbine is just an oil well turned upside down”... (G)

<http://www.psmag.com/nature-and-technology/how-a-conservative-billionaire-is-moving-heaven-and-earth-to-become-the-biggest-alternative-energy-giant-in-the-country>

Canada: Acting on Climate Change. 100% by 2035

Canadian scholars make recommendations for action on climate change. They believe 100% renewable electricity is reasonable by 2035. The first recommendation: a carbon tax.

Summary (G) & Full Report (PG)

http://www.sustainablecanadadialogues.ca/files/PDF_DOCS/SDC_Short_EN_lowres_10march.pdf

http://www.sustainablecanadadialogues.ca/files/PDF_DOCS/EN_15mars_17H_lowres.pdf

Austin: 1,200 MW of Solar Bids at Under 4 cents/kWh

At \$4 per MMBTU for natural gas, even in a 50% efficient gas turbine (about as good as they get), the fuel cost alone for a kWh of electricity is 2.8 cents. Add in capital costs, operations, maintenance, and profit and the costs for natural gas (and coal) electricity are likely to be 5 to 8 cents per kWh. And with gas and coal there are huge risks of fuel price increases and costs for carbon or additional pollution controls. In addition to being a very low price, these solar farms are 20-year fixed cost contracts where there is no risk to the utility of price increases. (G)

<http://www.greentechmedia.com/articles/read/cheapest-solar-ever-austin-energy-gets-1.2-gigawatts-of-solar-bids-for-less>

And, Nevada 100 MW of Solar Contracted at 3.87 cents/kWh (G)

<http://www.bloomberg.com/news/articles/2015-07-07/buffett-scores-cheapest-electricity-rate-with-nevada-solar-farms>

India Experiments With Solar Over Canals - Electricity & Reduces Evaporation

California may want to consider this to help with their drought. (G)

<http://www.popularmechanics.com/science/green-tech/news/a16516/indias-ingenuous-solar-canals/>

Research: 30% Improvement in Solar Cells By Making Use of Infrared

Today's solar cells make electricity from visible light photons. And there is a lot of energy in infrared photons that get wasted and just make the solar cells hot. Many solar cells get less efficient when hot. These researchers have developed materials that combine 2 infrared photons and emit one visible light photon - allowing solar cells to use infrared light for electricity. (PG)

<http://ucrtoday.ucr.edu/30606>

Improved Solar & Wind Forecasting Would Allow More Renewables on the Grid

With better solar and wind forecasts, it's possible that solar energy's contribution to the U.S.'s energy will reach up to 50%. Until now, due to intermittency, solar energy won't supply more than 20 to 30% of the U.S.'s energy. However, a collaboration between IBM and the U.S. Dept. of Energy (DOE) could double the accuracy of solar and wind forecasts within the next year with the help of IBM Research's machine learning technology.

Doubling the accuracy of renewable forecasting is an excellent development.

However, the wording on this announcements is misleading. Saying "solar energy won't supply more than 20 to 30% of US's energy" is making the very doubtful assumption that other strategies beyond better forecasting for reducing the variability of solar & wind will not apply. For example, strategies such as electricity storage, using transmission to smooth out the bumps between far flung wind and solar farms, and managing electricity use to optimize use of variable wind & solar resources will allow us to approach 100% renewables along with better forecasting. (G)

<http://www.rdmag.com/articles/2015/07/machine-learnings-impact-solar-energy>

Transportation

Speed: “Insane” Not Fast Enough? Now “Ludicrous” and Then “Maximum Plaid”

Tesla Motors continues its never-ending quest for car perfection with a newly available top speed setting of “ludicrous” - 0 - 60 in 2.8 seconds. While I find the speed names fun, the upgrades, and the “*we expect to increase (battery) pack capacity by roughly 5% per year*” all excellent news, this is the first time I’ve seen this Tesla goal: “...making the power train last a million miles...”

Really? Read Elon’s blog post in italics after the article. (G)

<http://www.autoblog.com/2015/07/17/tesla-announces-model-s-ludicrous-upgrade-90-kwh-battery/>

Tesla Slashes Costs of Replacement Body Parts

Tesla replacement auto body parts have been noted for being expensive - in line with body parts from Mercedes, Audi, and BMW. Tesla just slashed their part costs by some 66%, now making the, arguably, best car in the world, cheaper to repair than their competitors. (G)

<http://www.autoblog.com/2015/07/17/tesla-model-s-replacement-parts-getting-cheaper/>

Energy Storage, Etcetera

Why We Overcool Buildings & What to Do About It

New York Times. Why we overcool? *Being able to make people feel cold in the summer is a sign of power and prestige... What to do? Make people the thermostats... Users can tell the (smartphone) app, called Comfy, whether they are hot, cold or just right. Over time, it learns trends and preferences and tells the air-conditioning system when and where to throttle up or throttle back the cooling... Comfy-equipped buildings realize savings of up to 25 percent in cooling costs.* (G)

<http://www.nytimes.com/2015/07/05/sunday-review/enduring-summers-deep-freeze.html>

Audi Methane Gas Plant Joins German Balancing Market to Help Stabilize the Grid

The biggest grid problem with lots of wind & solar generation is not its variability, but having too much electricity at certain times. Audi has developed a natural gas factory - electricity, CO2 and water in, natural gas out - that can use up that excess to make methane. The methane is then pumped into the national natural gas grid. This helps balance Germany’s electrical grid. (PG)

<https://www.audi-mediacenter.com/en/press-releases/4499>

Refrigeration Battery For Supermarkets

Saves money by freezing ice at night or when renewable generation peaks - increasingly when electricity rates are lowest - and using that cold later for freezers and coolers while using far less electricity when rates are high. Managing electricity use helps maximize renewable use. (PG)

<http://www.triplepundit.com/2015/04/refrigeration-battery-lower-supermarket-energy-use-40/>