

Energy Matters

The energy news you need to know.

March 4, 2019

(Every two weeks)

The official e-newsletter of ...



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ENERGY
SOCIETY**

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- We are testing new formats for our e-magazine, [Energy Today](#) !
- AES recommends the international energy conference, [Energy ConFusion, in Skellefteå Sweden](#) on June 3-5. Contact AES if interested in attending.
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[Headline News](#)

Fossil Fuels

Oil: Brazil is the new "hot oil market," attracting new investments and adopting US-based exploration and production technologies. Consequently, **Brazil's oil production is increasing** (~400,000 barrels per day), the second-highest growth rate in the world behind the US.

Don't forget [CERAWeek 2019](#) , March 11 thru 15, in Houston, Texas.

Gas: Three recent "[giant](#)" offshore gas finds:

- Novatek's gas find in [North Obskoye](#), offshore Arctic Russia (11.3 trillion cubic feet).
- Eni and Total's [Block-6](#) discovery offshore Cyprus (170-230 billion cubic meters).
- Exxon's [Hammerhead](#) find offshore Guyana (too big for an accurate projection).

Coal: As US coal demand has declined, the number of active coal mines has decreased by more than half, from 1,435 mines in 2008 to 671 mines in 2017. Looking closer at the data, it appears that **smaller and less efficient mines were the first to close** . (Note: most of the inefficient mines that closed were in the Appalachian region.)

Carbon Capture: The same technology that allows scuba divers to "[rebreathe](#)" used-up carbon dioxide while underwater is being used to suck up harmful emissions. Researchers have found a way to collect and store CO2 gas using a special substance composed of organic chemicals called imino guanidines - or BIGs - that bind to bicarbonates in carbon dioxide-water solutions.

News you need to know about *carbon capture*, visit the [AES Newsfeed](#).

Low-Carbon Energy

Wind: [Makani](#) has spun off from Google and partnered with Shell to build energy [kites](#). Unlike most floating offshore wind technologies, the kites are mounted on small buoys moored with a synthetic line and gravity anchor.



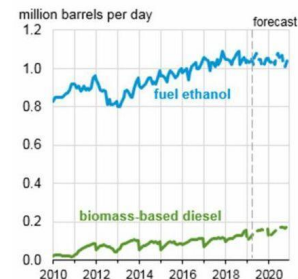
Renewables: Bloomberg New Energy Finance has published its **2019 Sustainable Energy in America Factbook**. It's not free, but AES provides a summary for Members:

- **Energy efficiency:** Investments reached a record level of \$15 billion USD in 2017, with Pennsylvania, Virginia, Connecticut, and Florida leading the effort.
- **Natural gas:** The total amount of all power generated by natural gas in the US is 35%, a new record.
- **Renewable energy:** Despite declining policy support, renewable energy continues to grow (19.5 gigawatts overall).
- **Energy prices:** US households continue to spend record lows of personal income on electricity and natural gas - average retail power prices fell 1 - 3%, although average prices rose in some regions.
- **Electric vehicles:** EVs accounted for 1.3% of total vehicles sold in the US in 4Q of 2017, but by the third quarter in 2018, the total doubled to 2.5% and then 3% by 4Q.
- **Battery storage:** Costs fell further as lithium-ion battery prices dropped 18% YoY.

Nuclear: Japan [restarted five](#) nuclear power reactors last year; it now has 9 operating reactors. (Note: Japan suspended its nuclear fleet in 2013 following the 2011 Fukushima accident.)

- **29 states and the District of Columbia (DC) have [renewable portfolio standards \(RPS\)](#)** that require a minimum share of electricity from designated renewable resources. These state-based RPS policies continue to drive more renewable electricity generation. California and Washington, D.C. have the most ambitious RPS, followed by Massachusetts, New Jersey and then Connecticut. (Note: no additional states have adopted an RPS policy since Vermont in 2015.)

- Since 2007, the US federal government requires that a minimum amount of biofuel-based ethanol is blended into the US transportation fuel supply. Today, the mandate is a little less than 10%, but individual states can increase that percentage within their borders. However, **only four states have increased the mandate: Minnesota, Montana, Oregon, and Pennsylvania.** Note: the RFS has kept biofuel production relatively stable - about 1 million barrels/day.



Energy Policy

- **Featured story:** Current methods of measuring PM 2.5 (fine particulate matter, or pollution) are so flawed that the results are either overstated or under-estimated. More than 80% of all counties in the US do not even measure PM 2.5 because they lack monitoring device. AES Premium Members have access to new [research](#) on PM 2.5.

- [Mandy Gunasekara](#) is leaving EPA to start [Energy 45](#), which will defend the President's environmental agenda and push-back against the Green New Deal.

Beltway Buzz

- To promote nuclear power, [Bill Gates](#) has told Congress that he will personally invest \$1 billion and raise \$1 billion more in private capital to match federal funds. Lawmakers are listening - Congress approved \$221 million to help companies develop advanced reactors and smaller modular reactors above the budget request. (Note: TerraPower, a Gates investment, received \$40 million from the US DoE in 2016.)

Policy around the world

- The European Commission will allow [soybeans](#) grown in the US to be used as biofuel in the EU; in exchange, the Trump administration agreed not to place a tariff on European Union car imports.

Climate and Environment

- In the time it takes you to read this entry of *Energy Matters*, the global building industry will pour more than 19,000 bathtubs of concrete. By the end of today, it will pour enough concrete to fill China's Three Gorges Dam. After water, [concrete is the most widely used substance on Earth](#). **If the cement industry were a country, it would be the third largest carbon dioxide emitter in the world** with up to 2.8 billion tons, surpassed only by China and the US.

- **Assessing the sustainability of six sectors:** energy, transportation, land use, industry, infrastructure and finance (AES Premium Members have access to the [report](#)):

- The shipping industry has implemented an aggressive carbon emissions reduction program, led by Maersk, the world's biggest shipping company.
- State and local governments are way ahead of federal/national governments and the private sector, investing about \$1 trillion a year in local sustainability efforts.
- Global renewable electricity generation reached 25% in 2017, and two-thirds of net new capacity added to grids.
- There are six sectors that are "not making sufficient progress": electric vehicles, public transport, heavy industry, the built environment, carbon pricing, and fossil-fuel subsidies.

- **In 2017, methane emissions across all sectors rose 1.5%**; those from oil and gas increased 0.5%. AES Members have access to the EPA [Greenhouse Gas Inventory](#).

- **The climate, by the numbers:**

- Last year, 83% of 3,800 cities in the US experienced temperatures that were warmer than normal.
- The new hole in the Thwaites Glacier in Antarctica is about 1,000 feet deep.
- 2018 was the fourth warmest year in the history of accurate measurement of global temperatures, and the last five years are all in the top five.

- **The agriculture sector uses about 30% of total global energy and produces about 20% of global greenhouse gas emissions.** When buying off-season produce, avoid any food that travels by air. Also, avoid fruits and vegetables grown in a heated greenhouse. For example, if you live in New York and are choosing between a fresh tomato grown in wintry Canada versus one trucked in from California, go with the one from California - tomatoes grown in a naturally warmer climate have a smaller footprint than the greenhouse variety because it takes a lot of energy to keep a greenhouse warm during the cold months. Better yet, stick to in-season produce - **in the winter months, buy root vegetables, winter squash and hearty greens.**

- **The Ecole des Hautes Etudes en Sciences Sociales (EHESS), France, is seeking an 18th Century Environmental Historian** as an Assistant Professor.

Electricity and Efficiency

- The industrial sector is the [largest](#) user of energy in the world, consuming about 55% of world energy. Within the industrial sector, the basic metal industry is one of the largest energy users, accounting for 12% of global industrial sector energy use. (The basic metals industry includes the manufacture of iron, steel, aluminum, and copper.) **The five countries that have the highest consumption per unit of industrial output:**

1. Russia
2. Australia/New Zealand
3. Eurasia (Eastern Europe)
4. South Korea
5. Brazil

Featured story: There are fuel supply concerns all over the US: the natural gas infrastructure cannot keep up with demand; coal retirements appear likely to cause generation gaps; and current renewable capacity is incapable of filling the gap. However, **the ISONE market (New England) will have an excess of capacity.** The total amount of ISONE's potential generating supply capacity is 57,798 MW, which is significantly higher than its 30,000 MW peak demand - and that is going down!

- **Cybersecurity: The US DHS and FBI have issued a cyber-attack activity warning** - SamSam ransomware is being used by terrorists to infiltrate critical energy infrastructure and insert network-wide infections into entire organizations. As a public service, AES provides unrestricted access to the US DHS [announcement](#).

Research and Markets

- **The top-4 industries that the US will "dominate" in the future**, according to the Trump administration. AES Members have access to the White House [Fact Sheet](#):

- Artificial intelligence
- Advanced manufacturing (robotics)
- Quantum information science
- 5G networks

- **Seven new digital energy startups to watch:**

- [Tachyus](#)
- [Dynamo](#)
- [RunTitle](#)
- [Mineralsoft](#)
- [Water Lens](#)
- [Hypersciences](#)
- [Gas Pos](#)

- **Four new bioplastic startups to watch** (plastics that use renewable feedstock instead of petroleum):

- [Newlight Technologies](#): uses a polymerization technology to convert greenhouse gases to valuable biodegradable plastics.
- [Lactips](#): develops cold-water soluble bioplastics manufactured from milk proteins.
- [Radical Plastics](#): converts conventional plastics into biodegradable plastics.
- [MycoTechnology](#): uses mycoprotein fungus to produce sweetener and protein products.

- It's start-up season! Among the many competitions open right now ...

- Applications are now open for Equinor's [Techstars](#).
- [Urban-X](#) is giving \$100,000 awards (and a 20-week coaching program) to 10 urbantech start-ups.
- [Elemental Exceleator](#) in Hawaii is awarding 15-20 companies with \$1 million - Qualifying applications are open now.
- [The Japan Energy Challenge 2019 Startup Pitch Competition](#) supports new ventures in the international energy sector.
- For hard-tech start-ups, [Prospect Silicon Valley](#) has a new round of applications (though some require monthly rent/fees.)
- [USICEF](#) has an accelerator program that supports India's renewable energy and energy access goals.

- **The Material Science and Technology Conference in Oregon is scheduled for September 29 thru October 3, 2019.** [Call for papers is open through March 15.](#)

- Members of AES can take a [free webinar](#) from partner organization American Chemical Society on March 14 at 2:00 EST: " **Is biodegradability a solution to plastic waste pollution in the ocean and on land?**"

Features

Quotes - Urban planning texting lingo, translated:

- **lol**: lament over-reaching legislation
- **btw**: budget for transit and walkability
- **brb**: build roads for bikes
- **idc**: implement the development code
- **smh**: support mixed housing
- **rfo**: reserve for open-space

What you may have missed

- Saudi Arabia and its OPEC allies are considering a formal [partnership](#) with Russia that would better manage the global oil market.

In memory: Wallace "Wally" Broecker, prophet of climate change. 1931-2019

Wally popularized the term "global warming" in a 1975 published a paper, "[Climatic Change: Are We on the Brink of a Pronounced Global Warming?](#)" He often said: "The climate is an angry beast and we are poking it with sticks."

Contacts

- [The American Energy Society](#)
- American Energy Society [LinkedIn Group](#)
- American Energy Society introductory [video](#)
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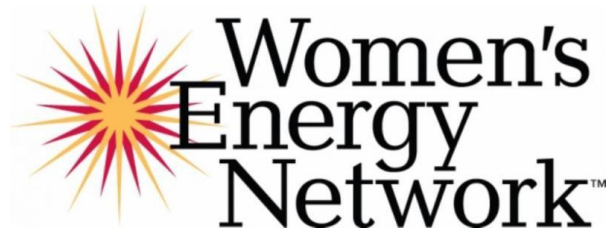
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