

Energy Matters

The trusted source for objective sound-bite summaries of the energy news you need to know

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— HEADLINE NEWS —

Conventional

- *Petroleum, special report*: **Blockchain's greatest impact in energy will probably be in the seaborne oil trade sector.** Oil tankers move about half of the total oil transported each day (about \$2.7 billion USD). *The paper bill of lading* that verifies ownership of the commodity has been and still is the most important part of every seaborne oil tanker transaction. However, banks, oil traders, and **energy companies are beginning to embrace [blockchain](#) to verify ownership throughout the supply chain**, which promises to boost profit margins by making the transactions faster. According to AES expert Member Alistair Cross, global head of operations at Mercuria Energy Group: "The way we do our title transfers and post trade execution has always been very heavy on paperwork. And the paperwork hasn't really evolved over the last hundred years." However, hurdles remain. For instance, the legal status of a blockchain e-bill of lading is not yet viewed the same as the physical paper bill of lading. "There's no case law," says Mr. Cross.

- *Gas*: **The average cost to build one horizontally drilled gas well is \$8.3 million USD** for drilling, integration, surrounding facilities, etc. (Note: a typical [horizontal](#) gas drill extends laterally about 8,300 ft.)

- *Coal*: **US coal production, exports, and prices increased in 2017.** Total US coal production in 2017 was 773 million short tons (MMst), 45 MMst higher than in 2016. An [increase in demand for US coal exports](#) more than offset a decline in domestic coal consumption. Meanwhile, [coal plants are retiring](#) at about the same rate (every 16 days) under both presidents Trump and Obama. **The top-5 US coal producing regions:**

1. Central Appalachia (\$60/short-ton)
2. Northern Appalachia (\$47/short-ton)
3. Rocky Mountains (\$41/short-ton)
4. Illinois (\$32/short-ton)
5. Powder River, Montana/Wyoming (\$12/short-ton)

- *Nuclear*: **US uranium production was the lowest in 15 years** - 2.44 million pounds in 2017, down 16% from 2016 and the lowest annual total since 2004 (2.28 million pounds). Note: US production peaked at 43.7 million pounds in 1980.

Renewables

- **About 100 cities around the world get more than 70% of their total electricity from [renewable sources](#)** (wind, solar, geothermal, hydro). The top-100 include four US cities (Seattle, WA; Eugene, OR; Aspen, CO; Burlington, VT) and five Canadian cities (Montreal, Vancouver, Winnipeg, North Vancouver and Prince George). Currently, Latin America leads the renewables charge, with 57 cities in the top 100. Of the remainder, 20 are in Europe, 9 are in Africa, and 9 are in North America.

- **Renewable energy (wind, solar and hydro, primarily) was the reason CO2 emissions in the US declined** by 2.3–3.3% from 2007–13, roughly matching the 2.5–3.6% decline resulting from the rise of natural gas. AES Members have access to the peer-reviewed [study](#). (Note: renewable energy contributes about 15% of the total amount of [electricity](#) generated in the US; natural gas contributes about 35%.)

- The [cost of lithium-ion batteries has decreased](#) by 80 percent since 2010 and is expected to halve again by 2025. During 2017, over 20,000 new household batteries were installed for renewable storage. That's up from 6,750 in the previous year. **The fastest growing storage market is Australia.**

- Coal supplied 80% of India's total power mix in 2016-2017, but renewable energy costs (wind and solar) have fallen 50% in the past two years - as low as \$38 per megawatt hour. **New wind and solar is now 20% cheaper than the existing coal-fired wholesale power price in India**, and 65% of India's coal power generation is being [sold at higher rates than new renewable energy bids](#).

Policy

- From 2000 until early 2015, California's gasoline prices were essentially the same as the rest of the country. That changed drastically in February 2015 when the Torrance oil refinery caught fire, tightening supply and raising prices. Three years later, **gas prices in California remain well above the national average**. The price premium in 2017 is more than [twice as large](#) as any year prior to 2015. The extra payments since February 2015 have cost California drivers about \$15 billion. For a comparison, the state government's entire contribution to the full University of California system will be about \$3 billion this year.

- "When all else fails, sue." Plaintiffs have filed **55 public records lawsuits against the EPA** since Trump's inauguration; 46 of those [lawsuits](#) came in 2017, making it the busiest calendar year. For comparison, George W. Bush's EPA faced only 57 lawsuits during his entire presidency.

- **In India, nearly 89 percent (165.9 GW out of the total of 187.1 GW) of the country's coal-fired power generation capacity is in violation of [emission levels](#) set by the Modi government in 2015.**

- Beltway Buzz rumor mill:

- The [Carbon Capture Coalition](#), a new bipartisan and nationally represented PAC, has one goal: **widespread adoption of carbon capture technologies**. The surprise inclusion of carbon capture tax credits in the recent budget package spurred overwhelming interest in the CCC, including: AFL-CIO, National Farmers Union, Bipartisan Policy Center, ClearPath Foundation, Mitsubishi, New Steel International, Shell, Third Way, etc.
- **The "biofuels/Renewable Fuel Standard" debate is heating up again**. Politicians from oil states (like Sen. Ted Cruz of Texas) view the plant-based RFS mandate as an unnecessary burden on refiners. Meanwhile, Republicans from agricultural states (like Sen. Charles Grassley of Iowa) regard the RFS as essential to securing the nation's energy independence and sustaining farming communities. Environmentalists are split. [Stuck in the middle is President Trump, who will have to sign any legislation reforming the RFS.](#)
- Judge William Orrick of the US District Court for Northern California (an Obama appointee) **blocked the Interior Department's delay of key requirements under the methane waste rule**. In a fiery order, Justice Orrick said that Interior's delay is "untethered to evidence" and slammed their regulatory analysis for "failing to consider ... the substance or merits of the original methane waste rule." *Rumor has it that the EPA is changing its strategy from a "phase-out" approach to "phasing-in desirable requirements."* AES Members have access to the 29 page [Injunction issued by Orrick](#).
- *It appears that **the Trump administration wants to shut down Energy Star** in order to "reduce the EPA's budget."* Launched in 1992 under President George H.W. Bush, Energy Star sets efficiency standards in more than 70 product categories, including appliances, electronics, heating and cooling, etc. It is entirely a voluntary program with a budget of less than \$60 million a year, but the GAO estimates the program saved consumers and businesses \$31 billion a year on energy bills. AES Premium Members have access to the [leaked EPA Memo](#).

Climate

- **Temperatures in the Arctic are the warmest ever.** Although shrouded in the darkness of a 24-hour polar night, temperatures have soared above freezing - the hottest temperatures recorded during winter.
- **Cities laid out on a precise 90-degree-angle grid have far greater buildup of heat** than cities more chaotically arranged. AES Members have access to the peer-reviewed [paper](#).
- **About 15% of all the gasoline burned in US is used by cars that aren't moving ... with a high of about 25% in Los Angeles.**
- **Climate-warming conditions cause anyone below the poverty line to experience 35 percent greater harm.** AES Members have access to the peer reviewed [study](#).
- **Moose and loons are the proverbial "Canaries In Coal Mine"** under extreme climate-change conditions.
- *News-of-the-weird:* Marc Jacobsen, a Stanford professor who has argued the country can be powered entirely on renewable energy sources, said he will **withdraw a multimillion-dollar lawsuit** against Christopher Clack, a lead author of a paper criticizing Jacobsen's work. Jacobsen said he realized "it is possible there could be no end to this case for years, and both the time and cost would be enormous." AES Members have access to the [article](#) by Clack that offended Jacobsen.
- *News-of-the weirder:* A Circuit Court judge in West Virginia **dismissed a defamation lawsuit coal magnate Bob Murray brought against HBO host John Oliver.** Murray and his company Murray Energy had sued Oliver as well as the network over a segment of "Last Week Tonight" during which Oliver criticized Murray as a "geriatric Dr. Evil." AES Members have access to a recording of [Oliver's controversial piece](#).

Electricity and Efficiency, Utilities and Power

- The American Society of Civil Engineers **gave the US a D+ for its electricity infrastructure** (water and transportation infrastructure also received D+'s.) AES Members have access to the [report card](#).
- **The power sector is driving decarbonization:** emissions from utilities peaked at 4.2% of the total in 2017. AES Members have access to the "Sustainable Energy in America [Factbook](#)."
- **Most and least expensive electricity rates in Europe - 2016**, €/kWh. (Note: .1 € = \$.12 USD)
Highest: Denmark (.31 €); followed by Germany (.30 €); then Belgium (.28 €). Note: about \$.35 USD / kWh
Lowest: Ukraine (.03 €/kWh); followed by Serbia (.06 €/kWh)
Eur avg: .20 €/kWh
- **Most and least expensive electricity rates in the US - 2016** (USD per kWh)
Highest: Hawaii at \$.33/kWh (which is equivalent to a monthly electric bill about \$300)
Lowest: Idaho at \$.08/kWh (which is equivalent to a monthly electric bill about \$75)
[US Avg:](#) \$.10/kWh (A typical US household uses about 900 kWh/month of electricity.)
- Power plants generate the majority of the world's electricity — more than 81 percent. These plants use fuels such as coal, gas or nuclear energy to make heat, which is then converted into electrical energy. For most plants, large volumes of water are a crucial part of the process, cooling high temperatures and powering turbines with steam. However, there is [no information about the amount of water used for cooling for 41% of the world's power plants](#).
- Interesting [Op-Ed](#) about the Puerto Rico Electric Power Authority (PREPA). Summary: vertically integrated across generation, transmission, distribution and retail, PREPA defines Puerto Rico's electricity sector; **politicized and dysfunctional, the utility has added \$9 billion to Puerto Rico's crippling \$74 billion debt** and restricts economic growth on the island.

From Basic Research to Markets

- Shell just paid Mexico \$343 million during an [auction for 9 of 19 offshore oil](#) blocks, the highest among all competitive offers. **Shell knew something no one else did.** Six months earlier, its drilling rig had struck a giant oil reservoir, "*The Whale*." Calculating that this significantly increased the chances that all of the Mexican blocks contained similar treasure, Shell delayed the announcement of the discovery until the day of the auction, after bids had been submitted.
- The Minerals Commission of **Ghana has confirmed [discovery of large lithium deposits](#)** in commercial quantities. The government is in the process of beginning exploration and expansion of its nascent storage/battery industry.
- As a result of the new tax bill (the Tax Cuts and Jobs Act, or "TCJA"), **[utilities observed the largest market-perceived escalations in credit risk.](#)** (The weighted average risk rate of the new tax bill on all US companies is 27.2%, but it is 28.3% for energy utilities.
- **Transportation showcase:**
 - Today's [car has the computing power](#) of 20 personal computers, features about 100 million lines of programming code, and processes up to 25 gigabytes of data for every hour it's on the road (the equivalent of about seven full-length high-definition movies), from engine temperature and tire pressure to what's playing on the radio.
 - Otonomo is a new company that collects and then sells data downloaded from cars to insurers, retailers, city planners and others. In return, it takes a percentage of sales. More than 2 million cars are already selling their data on the Otonomo platform. Contact [Otonomo](#) directly for more information on selling auto-data.
 - [GM's latest vision statement](#), declared by CEO Mary Barra, is a world with zero crashes, zero emissions, zero congestion. Step 1: emphasize collaboration with utilities who will replace gas stations as the primary source of power for automobiles.
 - Volkswagen plans to launch a fully automatic car with no steering wheels called the [ID Vizzion](#).
 - Russia now has a self-driving AV company, [Yandex](#), which recently absorbed all of Uber-Russia.

— FEATURES —

Spotlight - Energy Professional Development Opportunities

- O&G: [General Manager](#) at Weatherford, in Houston
- Coal: [Field Office Director](#), US Dept of Interior, Lexington, KY (salary: ~\$140,000 / year)
- Nuclear: [Nuclear Innovation Boot Camp](#), July 30 - August 10, Berkeley, California
- Renewables I: [Head of the AREI](#) (Africa Renewable Energy Initiative) Delivery Unit
- Renewables II: [Director of Membership](#), ACORE, Washington D.C.
- Policy: [Energy Analyst](#), Department of the Navy, Washington, DC (Clearance required: "secret")
- Climate: [Climate Change Mitigation Experts](#), for Stantec in Brussels, EU
- Utilities: [Webinar](#) - Detecting Fraud Rings with Graph Databases, March 8, 2:00-3:00 pm EST
- Research-to-Market: [Elemental Excelsator](#) - apply for Cohort 7, Hawaii; due March 30
- Academic: [Professor and Chair](#) of the Department of Crop Sciences, University of Illinois, Urbana (Search emphasis: the food/water/energy nexus.)

What You May Have Missed - The Stanford Strategic Energy Alliance

Stanford University is launching [The Stanford Strategic Energy Alliance](#), a new research program that will **match industry alliance members and Stanford professors who share common research objectives**. The alliance will also fund some early-stage research at the direction of its faculty leadership. Founding members ExxonMobil and Bank of America have committed \$20 million and \$7.5 million respectively. Stanford's Precourt Institute for Energy will manage the program. The American Energy Society applauds this ambitious and transformative effort.

Quotes

"The world needs to find the equivalent of ... six Saudi Arabias if it is to keep up with the expected increase in demand for oil between now and 2030." - Faith Birol, Executive Director of the IEA. (Note: T. Boone Pickens selected Dr. Birol as the fourth most influential person in the world's energy sector.)

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