

Energy Matters

The energy news you need to know.

September 16, 2019

The official e-newsletter of ...



**AMERICAN
ENERGY
SOCIETY**

Thank you for your Premium Membership.

[News from the Society](#)

From the desk of the [AES Editor](#): Forbes recently published a list of what its editor's called "[America's 100 Most Innovative Leaders](#)" - of that list, there were 99 men and one woman. (There were more leaders named "Stanley" than there were women.) **With no effort, we can think of a very long list of exceptionally innovative leaders throughout the energy sector who also happen to be women**, including but not limited to: [Nicole Eagan](#), highly decorated CEO of Darktrace; [Vicki Hollub](#), President and CEO of Occidental Petroleum (\$44 billion in assets); [Ceri Powell](#), who led Shell's exploration business to a number of remarkably successful discoveries in Malaysia and Australia (when others before her had failed) and is now Managing Director of [Shell-Brunei](#); [Susan Kennedy](#), the CEO leading Advanced Microgrid Solutions through a difficult pivot (and who once served as chief of staff to California governor Arnold Schwarzenegger, and was a key architect in the state's massive increase in renewable-energy capacity); [Brigadier General Jennifer Buckner](#) of US Cyber Command and Army Cyber-Directorate, who is leading US cyber-engagements against ISIS....

Visit the [AES website](#) for the new editorial policy concerning Forbes content.

[Headline News](#)

Fossil Fuels

- **Breaking news:** Early in the morning on Sept. 14, a **coordinated drone attack destroyed two Saudi oil sites**: Abqaiq, the world's largest oil-producing facility, and the Khurais oilfield, one of the world's most productive. Yemen's Houthi rebels claimed responsibility for the attack and vowed that more will come if Saudi Arabia does not cease military operations in Yemen. *Note:* Saudi Arabia produces about 9.85 million b/d, which means the drone attacks took about 5% of global production offline.



Oil: The Arctic/North Sea has become very popular again:

- [Total](#) plans to spend \$10 billion on E&P in the North Sea over the next 5 years.
- [Russia](#) will allow private companies to develop offshore resources in the Arctic.
- About 30 companies have submitted offshore bids to explore the [Norwegian shelf](#).
- The giant [Johan Sverdrup](#) offshore field in Norway has reached production stage.

Gas, Special report: The oil and gas industry accounts for about 1/3 of all methane emissions in the US. **The most common technology used to detect and measure methane leaks are mobile: drones, planes, and automobiles.** These mobile technologies have a 90% detection success rate. Visit the [AES Daily Dose](#) for a list of 10 leading methane detection technologies.

Coal: Special report: Not all coal is created equal - some types provide more energy and some burn dirtier. And, the distance from mine to large power markets matters too. For instance, the coal mining companies like Peabody Energy and Arch Coal in the Powder River Basin (Wyoming and Colorado) are struggling because the coal deposits in this region provide a dirtier type of coal and the region is far from customers. Other coal regions are better positioned to survive the ongoing down-turn - notably the Illinois Basin region (led by Alliance Resource Partners) because their coal burns hotter and less dirty and is closer to eastern power markets.

Carbon Capture: When legislation supporting carbon-capture stalled in Congress it was combined **with the " must-pass " defense bill.** AES Premium Members have access to the two combined bills: [National Defense Authorization Act](#), and Utilizing Significant Emissions with Innovative Technologies Act ([USE IT Act](#)).

Low-Carbon Energy

- **The state of renewable energy in 2018** (AES provides Premium Members access to the Renewable Energy [Status Report](#) by the IEA):

- Renewables accounted for almost 1/4 of global energy demand growth
- Solar PV electricity generation capacity grew 31% (a record year)
- Electricity generation from wind grew by 12%

Solar: The largest planned solar project in the US is the 500 MW Palen Solar Project (Riverside, California), by the EDF Group - start-date in 2020. Visit [AES Daily Dose](#) for the Top-12 largest solar projects in advanced development or under construction.

Storage: The California Public Utilities Commission (CPUC) will provide **\$100 million to support the development of behind-the-meter energy storage.** Applicants will receive about 35-50 cents per kilowatt-hour if they live in at-risk fire regions and will install in-home systems. Other state legislatures are considering similar incentive programs. In case you missed it, AES recommends "[Gone](#)," a story about PG&E and fire in its e-magazine, *Energy Today*.

Wind: On the one hand, if all of Europe's existing windfarm capacity was realized it would total 52.5 terawatts (TW), or enough power for [everyone](#) on Earth; on the other hand, building one wind turbine [requires](#) 900 tons of steel, 2,500 tons of concrete and 45 tons of non-recyclable plastic. (Note: The country that has the most wind-power potential and most under-performing wind-energy sector: *Russia*.)

Nuclear: Westinghouse is testing two new nuclear fuels that are accident tolerant (due to fuel pellets and claddings), which could improve safety and performance.

Policy

Spotlight State Level

- **North Dakota:** In 2015, a pipeline spill of natural gas liquids from Oneok Partners' Garden Creek gas plant in western North Dakota was initially reported as just 10 gallons; however, the local community gathered and shared evidence that **the spill was more than 1 million gallons** (3.8 million liters). The North Dakota Department of Environmental Quality now acknowledges they have recovered about



837,000 gallons (3.17 million liters) of natural gas liquids and about 90,000 gallons of contaminated groundwater. (Note: natural gas liquid "condensates" are highly toxic - they contain butane, propane and ethane.) An anonymous ND state regulator said that his agency ignored the original reports in 2015 because it seemed like "an endless list of hypothetical assumptions written by a bunch of unqualified moms with nothing better to do." However, new reports suggest that the spill might exceed 11,000,000 gallons.

- Massachusetts: Greenhouse gases in the Bay State [fell](#) 21% between 1990 and 2016, but continued efforts have stalled:

- An 800-megawatt offshore wind project off Martha's Vineyard is opposed by the Trump administration, which is calling for additional environmental studies.
- The New England Clean Energy Connect, a 145 mile transmission line that links Massachusetts to Quebec's network of dams, was given a permit by Maine utility regulators, but opponents are gathering signatures to hold a 2020 ballot referendum and NextEra Energy is challenging the project in court.

(Note: the two projects would reduce CO2 emissions by about 7% of the state's total.)

- Alaska: The fight for [ANWR drilling rights](#) continues, but some companies are interested and some are not:

- BP is selling out of Alaska even though it is one of the few companies that successfully drilled the only well in the coastal plain.
- Hilcorp has offered to purchase BP assets.
- Oil Search, a Papua New Guinea company, is acquiring rights along the Arctic coast and is building operational foundation to expand into ANWR.
- Repsol, a Spanish firm, has spent \$13 million to acquire leasing rights along the Arctic coast and is prepared to bid on ANWR even though the company announced it was "done chasing oil" and "wants to transition to a clean energy."
- Arctic Slope Regional Corp., a Native Indian corporation, holds 21 federal leases in Arctic waters off ANWR's coastline.
- Exxon Mobil and ConocoPhillips will form a partnership in ANWR "if and only if" the Department of Interior allows for deeper drilling.

- A House divided: The White House directed the EPA to [repeal](#) the Obama-era 2015 Waters of the United States rule, which expanded the types of waterways that received federal protections under the Clean Water Act. The White House will next prepare a replacement rule, probably submitted this winter. Twenty-two states, the District of Columbia, and US territories follow the 2015 rule, while the rest follow guidelines dating back to the Reagan administration. This issue is destined for the Supreme Court.

- State legal briefs: A number of cities and states have brought "climate nuisance" cases in US courts. Not all of the legal claims are the same across the cases, but they are all grounded in a form of nuisance law: they claim that oil companies should pay for damage caused by climate change. Six cases have made their way to the courts and now await various appeals. Energy companies — including Exxon Mobil, Chevron, Shell and BP — say the complaints should not be litigated by state judges but fall under federal jurisdiction because the Clean Air Act gives the EPA the authority to decide whether to regulate greenhouse gases. In an early setback for plaintiffs, the US District Court in Northern California ruled that a consolidated case from San Francisco and Oakland belonged in federal court and eventually dismissed it entirely; however, the district judges in the two most contentious cases — Baltimore (oral arguments in October) and Rhode Island — ordered that the respective cases shall be heard on a state level. *AES Members* have access to supporting briefs in the [Baltimore](#) case, the opinion and order in the [Rhode Island](#) case, as well as the appeal for state jurisdiction submitted by attorneys for [San Francisco and Oakland](#).

Climate and Sustainability

- The impact of Hurricane Dorian, a survey:

- [Bahama and Abaco Islands](#): at least 70,000+ people homeless.
- Florida: scraping its eastern coast, six people killed; two million evacuated.
- South Carolina: more inland damage due to a tornado that spun off the hurricane.
- North Carolina: 29,000+ without power.
- [Canada](#): not classified as a hurricane, the same storm system still caused extensive power outages.



Note: At about [the same time](#) as Hurricane Dorian, Tropical Storm Fernand hit Mexico's upper Gulf coast while the weaker Hurricane Juliette hit Mexico's Pacific coast

- Environmental impacts you didn't know you have (from [Inconspicuous Consumption](#), by Tatiana Schlossberg):

- Netflix uses 15% of all Internet bandwidth on earth.
- Shoppers return 35% of goods they buy online, as much as six times more than when they shop in stores.
- Producing polyester for clothes emits as much carbon dioxide as 185 coal-fired power plants.
- A single fleece garment can shed 100,000 plastic microfibers in one washing.

tatiana schlossberg
inconspicuous consumption
the environmental impact you don't know you have

- Prince Harry has brought together travel-related companies (Visa, Booking.com, TripAdvisor, China's largest travel company Ctrip, and Skyscanner) to develop a system that improves [sustainability](#) of global travel.



- Of the 23 largest companies that mine cobalt, copper, lithium, manganese, nickel and zinc (key minerals for EVs, battery storage, solar panels and wind turbines), **87% have been linked to [human rights abuses in their mines](#)** (including land rights infringements, corruption, and murder).

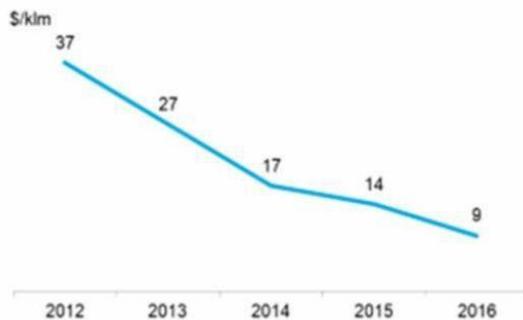
Electricity, Power and Efficiency

- North Dakota, Montana, and Wyoming consume [the most](#) residential electricity per capita; New Mexico, California, and Hawaii consume the least.

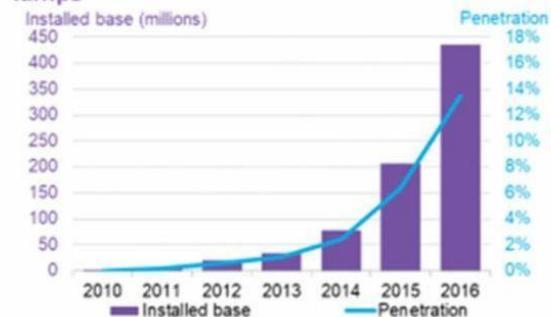
- Total investment in U.S. electric generating capacity in 2017 [decreased](#) by 27% from the previous year.

- The light-emitting diode (LED) is a technology that displaces traditional incandescent bulbs, while providing longer lifetimes and significant savings for consumers. **A comparison of LED prices and LED installations, over time:**

LED price, A-type lamps



LED installed base and penetration, A-type lamps



Note: The White House is [withdrawing](#) these LED regulatory standards.

Cyber Spotlight Special

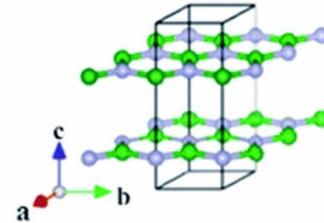
- The all-time largest data breach was Yahoo in 2013 (3 billion accounts). Visit [AES Daily Dose](#) for a list of the 10-largest data-breaches of all time.

- AES is co-hosting a special conference on cybersecurity solutions for the power sector. [Contact us](#) for discounts to the conference, an assigned personal concierge, and targeted introductions to attendees.



Research and Markets

- Two-dimensional hexagonal-boron nitride (h-BN), an insulating material also known as "white graphene," is four times stiffer than steel and an excellent conductor of heat (*represented as the green layer in the image insert*). **Researchers are developing a suite of h-BN's** that will serve as a library or toolbox of this material in order to support a variety of material applications.



- *Special report:* **BloombergNEF and the Carbon Tracker Initiative offer different analyses of the shift to renewable energy by the oil and gas industry:**

- [BNEF](#) - the world's largest oil companies are conducting a record number of clean-energy deals, including so far this year about 70 deals in solar, wind and biofuels.
- [Carbon Tracker](#) - oil and gas companies have expanded their budgets (+\$50 billion since 2018) for fossil fuels, including Exxon Mobil's \$2.6 billion Aspen project in Canada, which is the first greenfield oil sands project in five years.

Autotech Spotlight Special

- The US Air Force and DZYNE have developed [ROBOPilot](#) - a robot that can fly airplanes. Autopilot technologies have been around for a long time, but this is different. The autonomous robot can be fixed to the seat base of any aircraft and needs no modifications or autopilot. In other words, **any aircraft could be turned into an ad hoc drone**.



- **The [state of EV's](#) in Europe, by consumer interest** (note: 2.2% of all vehicles in the world are EV):
- [Germany](#) and the Check Republic are the *least* interested in EVs (16% of drivers would buy an EV).
 - Italy and Romania have the *most* interest in EVs (36% of drivers plan their next car to be electric. (Romania is the fastest growing EV market in Europe).
 - Last year, 39% of all new-car sales in Norway were EV, followed by Sweden (6.3%) (*that is not a typo*).
-

Features

Remembering T. Boone Pickens

b. May 22, 1928 - d. September 11, 2019



Ten things about T. Boone Pickens:

1. He was born in Holdenville, Oklahoma.
2. Boone's father worked as a mineral landman (rights leaser) and his mother ran the local Office of Price Administration, in charge of rationing gasoline in three counties.
3. At age 12, Boone had a newspaper route delivering 28 morning papers; he expanded to 156 papers by "buying out" the routes of 4 other delivery boys.
4. Boone attended Texas A&M on a basketball scholarship, but the award money was cut, so he transferred to Oklahoma A&M (now Oklahoma State University).
5. In 1951, Boone graduated, got a job at Phillips Petroleum, then left the company in 1954 to begin wildcatting (drilling unproven well sites).
6. The 1980s was T. Boone's most active decade, from acquiring and consolidating many independent oil and gas companies, to considering a run for US President.
7. In 1997, Pickens founded BP Capital Management (then called BP Energy Fund) – the initials standing for "Boone Pickens" and is not related to British Petroleum.
8. In his 2008 book, *The First Billion is the Hardest*, Boone admitted that he believed in the "peak oil" theory. He later altered that position.
9. In the 2010s, Boone publicly supported nuclear power, natural gas (especially for transportation), and the promotion of alternative energy.
10. Editors for *The Washington Post* recently noted "the strangest roles that [Pickens] had fashioned for himself: the billionaire speculator as energy wise man; oil-and-gas magnate as champion of wind power; lifetime Republican and fellow advocate among environmentally minded Democrats."

Quotes: Examples of hyperbole to make a point

On the White House granting waivers for ethanol biofuels:

- "It's a train wreck." Nick Bowdish, CEO of Elite Ethanol in Atlantic, on the unpredictable way that biofuel waivers have been granted
- "They screwed us." Chuck Grassley, the Senior US Senator from Iowa, on the White House granting biofuel waivers to large refineries

Or, the Democratic Party town hall Debate, hosted by CNN:

- "What might history say about the Democrat's Town Hall debate? It will say that candidates for our highest office, centuries after the Enlightenment, still had to declare publicly that they believe in science." - Ted Johnson, reporter for Deadline
- "The seven-hour town hall on the 'climate crisis' lasted only two-millionths of a second — if you plot it on Carl Sagan's cosmic calendar — but it felt like butt-numbing eternity." - Dan Zak, reporter for the Washington Post

In case you missed it, from [Energy Matters, vol. 17.6](#)

- **Kinetic**. A quarry in Biel, Switzerland, uses a dump truck that consumes no energy. The truck (*image*), which weighs 45 tons (with tires 6 feet tall) has a regenerative braking system that recaptures enough energy on its way downhill to recharge the eDumper's batteries to go back up, as well as a surplus. (*Editor's note*: A typical dump truck uses between 11,000 and 22,000 gallons of diesel fuel and produces 196 metric tons of CO₂ each year.)



Contacts

- [The American Energy Society](#)
- American Energy Society [LinkedIn Group](#)
- American Energy Society introductory [video](#)
- [Contact us](#) with comments about the Society or this issue of *Energy Matters*.

Partner-Sponsors

The American Energy Society deeply appreciates the support of its Partner-Sponsors:



In the category of cybersecurity
[Darktrace Industrial IoT](#)



In the category of engineering firms
[The Cadmus Group](#)



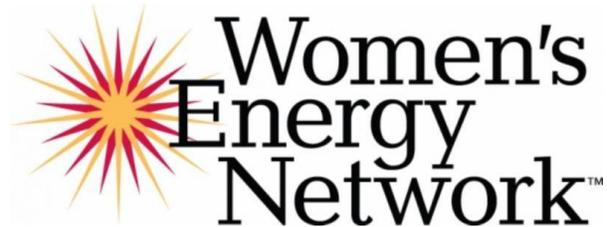
In the category of law
[Orrick](#)



In the category of Accelerators/Incubators
[Nordic Innovation House](#)



In the category of academia
[Energy Analysis and Policy Program](#)
University of Wisconsin - Madison



In the category of Associations
[Women's Energy Network](#)

Please [contact us](#) if you or your organization would like more information about the Society's exclusive **Partner-Sponsor program** .

BE A CATALYST FOR CHANGE

Change global energy
Support energy literacy
Engage with thought-leaders