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ENERGY MATTERS

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— HEADLINE NEWS —

Conventional

Petroleum

- **The 5 "most important" oil fields in the world** (AES Members have access to [annotated notes](#)):

1. [Ghawar \(Saudi Arabia\)](#) - 88 billion barrels of oil remaining in reserve
2. [Burgan \(Kuwait\)](#) - 69 billion barrels in reserve
3. [Safaniya \(Saudi Arabia\)](#) - 52 billion barrels in reserve
4. [Rumaila \(Iraq\)](#) - 18 billion barrels of recoverable oil
5. [West Qurna-2 \(Iraq\)](#) - 14 billion barrels of recoverable oil

Note: This list does not include mega-fields like Sugar Loaf in Brazil (~32 bn), Bolivar Coastal in Venezuela (~30 bn), or Cantarell in Mexico (~35 bn). The largest oilfield in the US is in [Prudhoe Bay, Alaska](#), with 13 billion barrels of recoverable oil, double the next largest US field (Bakken, North Dakota ~ 7.3 bn). The largest in Russia is the Samotlor Field in West Siberia (~15 billion barrels in recoverable oil).

Gas

- **Shale gas production, a comparison: US Appalachia ("coal country") vs the World**, in Bcf/d (AES Members have access to the [top-10 list and annotated notes](#)):

1. Russian Federation (55.9 Bcf/d)
2. Total for the US, minus Appalachia (49.3)
3. *US APPALACHIA (23)*
4. Total for all of Africa (20.1)
5. Iran (19.5)

Coal

- Despite general downward trends, **coal has a [strong grip](#) within the European power sector**; for instance, Germany still generates about 40 percent of its electricity from coal.

Nuclear

- The DoE has a **new funding campaign to support research related to nuclear energy**. The new program will last five years, applications will be due on a year-round basis, and the quarterly selection process will grant \$30 million in awards throughout 2018; additional funding will be available in future years, as allocated by Congress. The [FOA](#) reference number: DE-FOA-0001817. The first [applications](#) in the series are due January 31, 2018; however, the DoE will conduct a webinar on January 9, 2018.

Renewables

- **Renewable energy prices** have become competitive around the world:
 - Zambia - a World Bank-led solar power auction saw a winning bid of 6.02 cents per kilowatt-hour
 - Saudi Arabia - solar generated electricity dropped to 1.79 cents per kilowatt-hour
 - Mexico - in a non-subsidized auction, wind energy prices reached 1.77 cents per kilowatt-hour
 - Alberta - the province's first wind auction saw a winning price of 3.7 cents per kilowatt hour (half the cost of natural gas per kilowatt hour).
- The most recent **winning bids in the latest Mexican renewables auction** was less than two cents per kilowatt hour. These prices are especially remarkable because Mexico offers no subsidies, either explicit or implicit. The main reasons why prices are so low is that Mexico is a great place for solar and wind, and labor costs are low. In contrast, early solar adopter Germany receives only about half as much sun and has significantly higher labor costs. AES Members have access to the [Renewable Energy Roadmap](#).
- Since 2010, **costs for new solar** PV have decreased 70%, wind by 25% and batteries by 40%.
- **Tesla recently unveiled a battery-powered truck**, promising drivers they could charge 400 miles of distance in as little as 30 minutes using the new Tesla "megacharger." However, **Tesla's promises are untenable**; [the power required for the megacharger to fill a battery](#) in 30 minutes would be 1,600 kilowatts - that is the equivalent of providing power to 3,000-4,000 "average" houses, and 10 times more powerful than Tesla's entire network of "superchargers."

Policy

- Breaking News: *Editor's of Energy Matters* have a policy of not reporting draft proposals or bills under consideration; however, *President Trump's plan to allow drilling anywhere off the coast of the US is unprecedented and deserves consideration - no prior administration has ever proposed so many lease sales in a single offshore drilling program. The US Interior Department is proposing 47 possible auctions of drilling rights in more than 90 percent of the entire US outer continental shelf.* The draft plan opens the door to selling leases in 25 of the nation's 26 offshore planning areas, including 19 auctions in the Alaska region, seven in the Pacific region and nine in the Atlantic, including the straits of Florida. The only region the Trump administration has ruled out is the North Aleutian Area in Alaska, which had been excluded from leasing by former President George W. Bush. (Note: the Obama-era plan Trump is aiming to replace had limited drilling to central and western Gulf of Mexico and in Alaska's Cook Inlet.)
- **The Department of Interior was very busy on December 29**, the last business day of 2017, it:
 - Rescinded standards for well construction and wastewater management for hydraulic fracturing and disclosure of chemicals contained in fracking fluids.
 - Dismissed rules regarding devices used during offshore oil production that were put in place by a bipartisan commission after the 2010 Deepwater Horizon disaster.
 - Renewed leases for copper and nickel mines that are on the border of Minnesota's federally protected Boundary Waters Canoe Area Wilderness.
 - Publicly announced that it would not prosecute oil and gas, wind, and solar operators for accidentally killing birds under the 1918 Migratory Bird Treaty Act. The federal government has used the law to impose large fines after environmental disasters — including the BP oil spill.
- **Breaking news: Congress has allowed a \$.09/barrel tax on domestic and imported crude oil and petroleum products to expire** and will not reinstate it. The tax on companies selling oil in the US generated an average of \$500 million in federal revenue per year and constituted the main source of revenue for the [Oil Spill Liability Trust Fund](#). The fund has about \$5.75 billion in reserve.
- A recent Pew survey found a [47-point gap between Republicans and Democrats on the need to address climate change](#), one that's wider than on immigration or race relations.

- As is customary at the start of every new year, **the US EPA has announced the removal of 7 cleaned-up sites from its Superfund list** (new designation: "appropriate for new development"):

1. Nutting Truck & Caster Co., Minnesota
2. Shpack Landfill, Massachusetts
3. Perdido groundwater contamination site, Alabama
4. Mystery Bridge Rd/U.S. Highway 20, Wyoming
5. Ellisville, Missouri
6. Omaha Lead, Nebraska
7. North Penn — Area 6, Pennsylvania

NOTE: **The U.S. EPA has also released its top "Priority Superfund Sites" for emergency "Surge of Action."** [AES Members have access to the full list of 21 emergency superfund sites.](#)

- Comparing all US federal agency Directors during President Trump's first year in office, **EPA Secretary Scott Pruitt is easily the most active**, as measured by policy rollbacks or reversals:

- Environment: 63
- Labor: 28
- Health care: 17
- Civil Rights: 16
- Worker safety: 16
- Government reform: 13
- Immigration: 12
- Education: 7

- **China is illegally selling oil to North Korea.** US recon-satellites photographed around 30 illegal transactions in October 2017.

- **Lamar Smith has announced that he will retire when his term ends this year.** The Texas representative and chairman of the US House of Representatives' Committee on Science, Space and Technology is the strongest [opponent](#) of climate change remediation policies in either chamber.

Climate

- **The Kaya identity** (*noun*) def: A mathematical formula that evaluates a country's total emissions from energy (CO₂) as the product of four terms: (1) total population (Pop), (2) GDP per capita, (3) energy intensity of the economy (which is total energy divided by GDP), and (4) carbon intensity of energy (emissions per unit energy). By definition, emissions cannot decrease unless one or more of these Kaya factors also decreases. Also represented as:

$$CO_2 = Pop * \frac{GDP}{Pop} * \frac{Energy}{GDP} * \frac{CO_2}{Energy}$$

- **Countries that decoupled GDP growth from carbon in 2017** (as measured by the amount of carbon emitted per unit of economic growth):

- Top-5: France, South Korea, Brazil, Canada, Saudi Arabia
- Honorable mention: Argentina and Indonesia

- California air quality regulators designate the 500-foot radius around busy freeways as unsafe air-quality for schools, daycare, retirement homes, and housing tracts. However, new research has found that [traffic pollution drifts about 10 times farther](#) (~5,000 feet, or about 1 mile) late at night and in the early morning than during the day.

- So far in 2018, **Anchorage, Alaska, has been warmer** than Jacksonville, Houston, Atlanta

- **The state of Delaware is suing Pennsylvania and West Virginia** (by way of a lawsuit filed against the EPA) for [relief from upwind air pollution](#) produced by their power plants.

Electricity and Efficiency, Utilities and Power

- On January 10, 2018, the Federal Energy Regulatory Commission (**FERC**) will decide whether to finalize the DoE [electric grid plan](#) that would reward facilities capable of keeping 90-day fuel supplies on hand — if approved it will favor power plants that are powered by coal or uranium. The bitter cold front that has blanketed the US East Coast provides "I-told-you" justification for some sort of backup to the power supply. However, there is a significant amount of opposition to the [grid resiliency proposal](#), including the argument that it is a rejection of basic market principles (power plants get paid to produce unused power).
- For every **1 degree Celsius (1.8 degrees Fahrenheit)** that a [thermostat is turned down](#), a building can **save 10 percent of its heating energy**, and the reverse is true for cooling.
- **Millions of people in [Puerto Rico are still without electricity](#) (about half the population).**
- [The debate continues](#) ... which power source is best during cold winter months?
 - Nuclear? There are 99 nuclear generating units in the US and every one of them is currently operating - a testament to reliability.
 - Natural gas? New digital technologies have made natural gas the dominant source of abundant and affordable power throughout the US.
 - Coal? Coal prices are trending down, which means coal is efficient when temperatures plunge.
 - Renewables? When available, no source bolsters the grid at peak demand better than cleanenergy.

Research to Tech-to-Market

- **A partnership between Lamborghini and MIT has produced a new supercar - the Lamborghini Terzo Millennio.** 'Lambo's' first all-electric concept car offers features like self-healing bodywork and semi-autonomous driving capability.
- [Fossil fuels currently provide about eighty per cent of the world's energy.](#) Proportionally, this figure hasn't changed much since the mid-eighties, but because populations have grown and global energy use has nearly doubled, the amount of coal, oil, and natural gas being burned today is almost two times greater.
- **A new (reversible) two-layer fabric can keep skin a comfortable temperature** whatever the weather (depending on which side of the fabric is worn against the skin and which side is facing out). The fabric works so well that it can create a 6.5°C temperature difference, depending on which way it is worn. AES Members have access to the peer-reviewed [abstract](#).
- Shell has partnered with a consortium involving some of Europe's largest carmakers to [build a network of EV fast-charging stations](#) across the continent. The charging stations will be installed at 80 highway Shell sites, beginning in 2019. **Drivers will be able to charge their EVs in five to ten minutes.**

— FEATURES —

Spotlight

- [Taming the Sun: Innovations to Harness Solar Energy and Power the Planet](#), by Varun Sivaram (forthcoming). The first important policy book of 2018, Sivaram offers a fair and balanced case that solar energy could be a boon to mankind and the environment, but it's going to need a lot more policy support.