

Energy Matters

January 21, 2020

Sound-bite summaries of the energy news you need to know.

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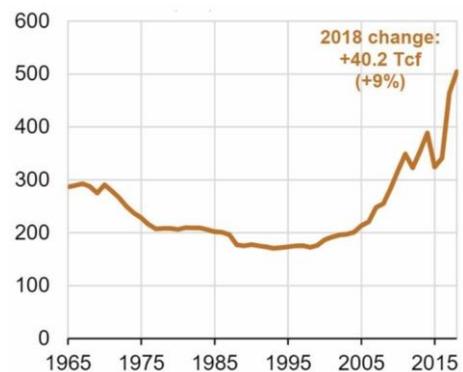
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Fossil Fuels

- **Oil**, a sector primer:

- Most oil from the US comes from five states, in order: Texas (40% of the total), North Dakota (11%), New Mexico (6%), Oklahoma (5%) and Alaska (4%).
- The US consumes about the same amount of oil as it produces; yet, it still imports about 4 million barrels of oil per day, or about 20% of total consumption; most comes from Canada (41%).
- The US exports about 7.5 million barrels per day (or about 26% of total petroleum exports; US oil imports are less than half what they were at the peak in 2005).
- Depending on the location of the market in the US, it can be a lot cheaper to get cargo from Rotterdam to the East Coast than to push it from Texas; it can be much cheaper to transport oil from the Middle East to certain regions in the US than pushing it through pipelines from West Texas.

- **Natural Gas**: Another record-setting year. Natural gas reserves had another record-breaking year in the US, rising to 504.5 trillion cubic feet (Tcf), a 9% increase compared with the record level set in 2017 of 464.4 Tcf. Texas saw the largest net increase in natural gas proved reserves, and the next-largest net gains were in Pennsylvania and New Mexico. (Insert: US natural gas proved reserves, by year and in trillions of cubic feet.)

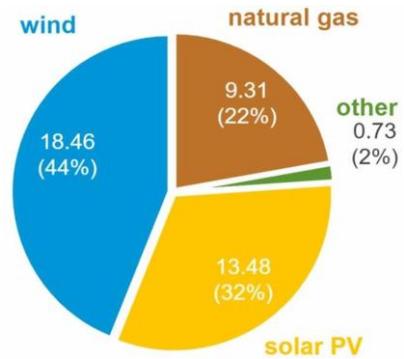


- **Coal in free-fall**: In the US, coal ended the decade at less than half the level that it started the decade; moreover, American coal use fell 18% last year, the largest one-year drop in coal consumption in US history.

- **Carbon Capture**: The US DoE is offering \$15 million in federal funding for "Novel Concepts for the Utilization of Carbon Dioxide from Utility and Industrial Sources." See the [AES energy newsfeed](#) for more details, including the application date.

Low-Carbon Energy

- According to a recent survey of electric generators, 42 gigawatts (GW) of new capacity will be installed in 2020, with **solar and wind providing almost 32 GW (or 76%) of the total**. (Insert note: the "other" 2% will come from storage.)



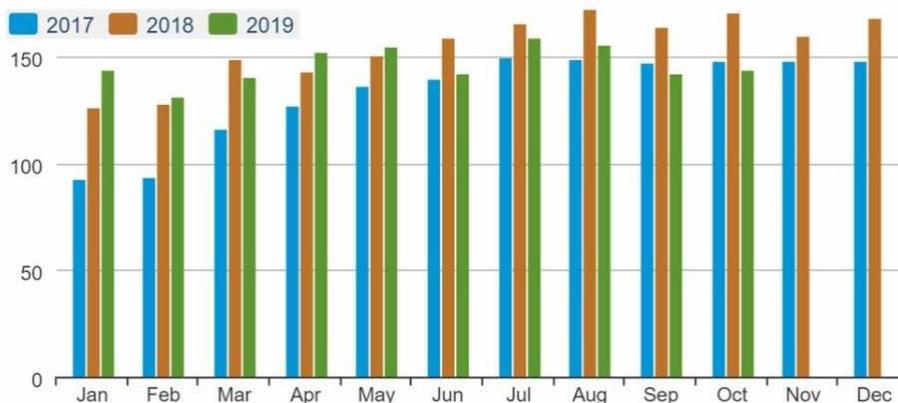
- [Dayaway Careers](#) conducted a survey of approximately 500 early-stage cleantech women professionals and found a number of interesting trends, among them, **75+% of all young women professionals in renewable energy are in just seven states**.



- **Spotlight: Britain.** In 2010, Great Britain generated 75% of its electricity from coal and natural gas. By the end of the decade, coal generation declined from the decade's peak of 41% in 2012 to under 2% in 2019; meanwhile, [wind power](#) is up from 3% of the total in 2010 to supplying 20% of the country's electrical demand in 2019.

- **Biodiesel, by the numbers** (insert, US monthly production, in millions of gallons):

- 68% of all biodiesel production comes from the Midwest region (Petroleum Administration for Defense District 2).
- 93 biodiesel plants produce 2.5 billion gallons per year.
- 2018 was a record-setting year for biodiesel production; production declined in the latter-half of 2019.



- The US produces about 1/7th of the global supply of [hydrogen](#) with 95% of that total produced from natural gas. **Globally, 75% of all hydrogen is produced from natural gas.**

- In the industrial era, two countries have been more committed to [renewable energy](#) in scope and scale than any other: Iceland with geothermal; and, Costa Rica with hydropower.

- **The small nuclear reactor sector is growing the fastest in Canada.**

Policy

- *Featured story:* **Midwest farmers call it [Trump-money](#).** The federal government is providing financial aid packages to America's biofuel/ethanol farmers, the highest level in 14 years, much paid out without any action by Congress. Some of the aid comes from long-familiar programs, like government-subsidized crop insurance. Other payments are unprecedented, such as the aid from the USDA, which is [sending checks](#) to compensate farmers for low prices caused by the trade war. In 2018, the USDA provided \$12 billion in trade-related aid to farmers; in 2019, the USDA provided \$16 billion. About \$19 billion of the \$28 million has already been paid out, and the rest will be paid in 2020.



- Finding ways to [reuse](#) lithium-ion car and bus batteries is becoming more urgent as the global stockpile of EV batteries is forecast to exceed 3.4 million packs by 2025, compared with about 55,000 this year. **China, the EU, and the US are considering rules to make carmakers responsible for expired batteries and to keep them out of landfills.**

- *Spotlight:* **India.** Government authorities have threatened to close coal-fired utilities around [New Delhi](#) if they do not install equipment to cut emissions; however, the Indian government is also ending a [\\$5.61/ton tax](#) on coal to ease financial pressures on utility and distribution companies.

- *Spotlight:* **Germany.** Germany will pay utility companies to speed up the shutdown of their coal-fired power plants (note: coal provides about a third of Germany's electricity needs); however, **the government approved the opening of the new "Datteln 4" coal-fired plant and the expansion of the Garzweiler coal mine in western Germany.**



Climate, Emissions and Sustainability

- **Q. What is sustainable in terms of emissions per person?**

A. The average individual rate of 3 tons of CO2 emissions per person per year.

- The global average is 4.5 tons CO2 per person per year.
- The average person in the US emits about 17.5 tons of CO2 per year.
- The average person in China emits about 6.4 tons per person per year.
- The fleet of coal-fired electricity power plants in the US produces 5.3 tons of CO2 per American per year, or about 177% of each person's sustainable allowance.

- **Climate Spotlight:** [Pakistan](#). The warming climate is melting and shrinking the glaciers in the Karakoram mountain range in northern Pakistan. A massive sheet of ice and debris is pushing down the valley at ten times faster than the normal rate, threatening the safety of the people and homes below - as much as four meters per day.

- Current peer-reviewed research of the health effects of weather and climate largely focus on parasitic and infectious and other chronic diseases. But a new study has found that physical injuries vary seasonally, and that **serious physical injuries and accidental deaths increase during anomalously warm and cold weather events**. In other words, severe weather makes people angry, and then they make bad decisions. AES Members have access to peer reviewed research about the relationship between severe weather and [accidental injuries](#) and [mental health](#).

- **The US city that has the most successful waste-management programs is San Francisco** - through recycling and composting, the city manages to keep around 80% of its waste out of landfills. By contrast, American cities on average recycle and compost about 35% of their waste; [Europeans do a bit better](#), keeping almost half of their municipal trash out of landfills on average.

- [Oceans](#) have absorbed roughly 93% of the heat associated with human-caused greenhouse gas emissions, which prevents severe land warming; however, that has also led to significant loss of marine life and increasingly severe tropical storms (such as hurricanes Harvey, Maria, etc.) that feed on warm ocean waters. For instance, in a section of warm ocean water in the northeast Pacific Ocean called "[the Blob](#)," one million seabirds died in less than 12 months in one of the largest mass die-offs in recorded history.

Research and Markets

- Just a few years ago, [micro-mobility](#) was all the rage, but venture capital **funding for micro-mobility startups is down** to around \$1.3 billion in 2019 as of Sept. 30, down from more than \$5 billion in 2018.



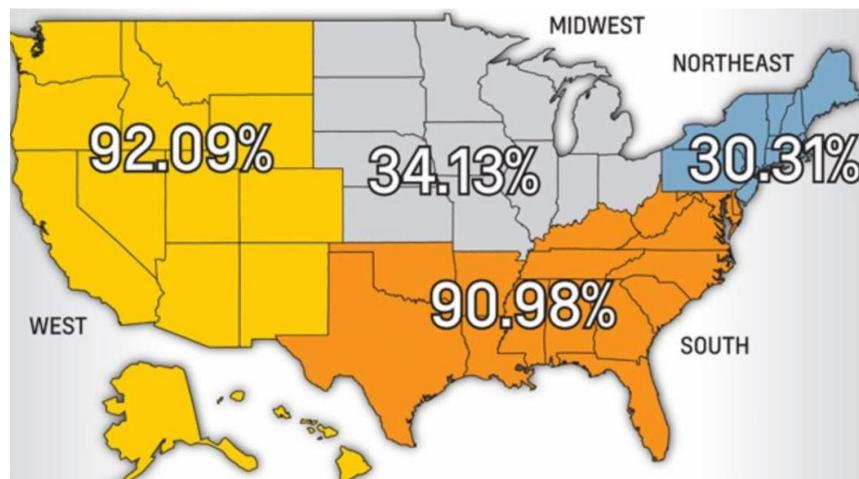
- Insurance companies have a new resource - [the Actuaries Climate Risk Index](#) - which identifies a quantitative multiplier for private property risks.

- Hyundai has partnered with Uber to mass-produce [autonomous Uber Air Taxis](#).

- [Stanford Global Energy Heroes competition](#): Submit your application as a three-minute video to compete for one of three \$20,000 cash prizes plus a trip to the Global Energy Forum 2020. Applications are due by January 31, 2020.

Electricity, Power and Efficiency

- Percentage of consumed energy in each region also produced in that region:



- In the US energy sector, 77% of employers report [difficulty hiring qualified workers](#). It appears that is changing for the utilities sector, especially those shifting to renewable energy and adopting new technologies. Hiring results for the oil sector are uneven - companies that take into consideration climate change and carbon taxes align with the concerns of Millennials and Gen-Z'ers.

- In response to unplanned outages (aka wild-fires), a number of communities in California are developing **back-up micro-grid storage/supply electricity facilities**, including:

- [Borrego Springs Microgrid](#), a desert community microgrid.
- [Carmel Valley Energy Storage System](#), a lithium-ion system.
- [Miguel Energy Storage System](#), a vanadium redox flow battery.

Cybersecurity Spotlight

- US government officials presented the British government with new evidence that **using Huawei equipment in future 5G mobile networks was "madness"**, the technological equivalent of a "[Trojan horse](#)". Huawei officials called the US government hypocritical.