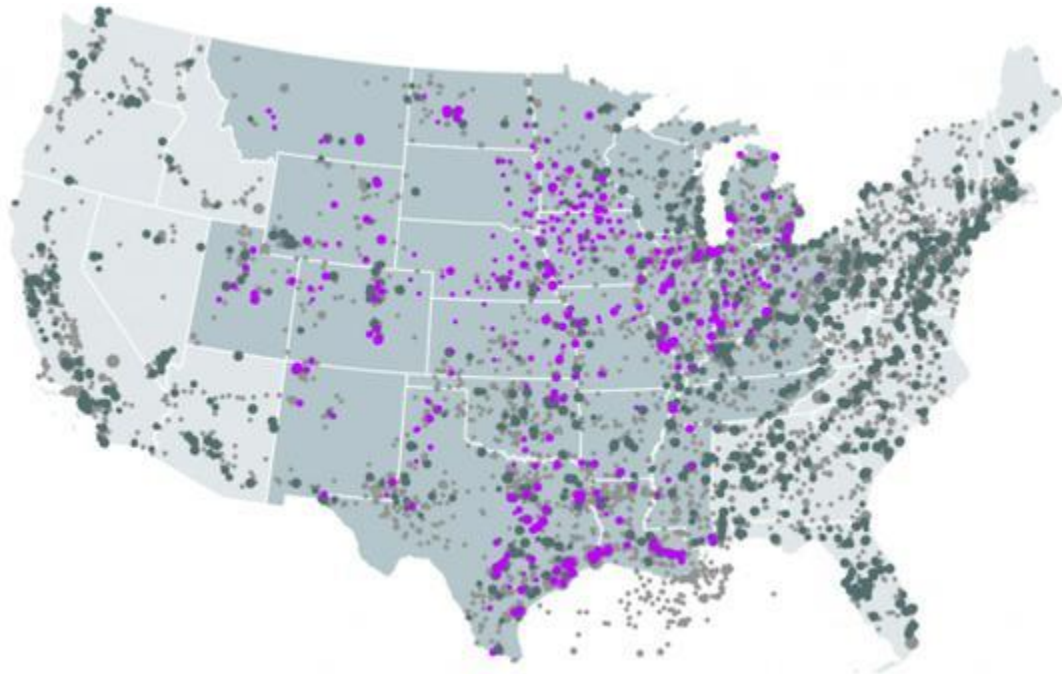


Coal: In 2019, US coal production totaled 706 million short tons (MMst), a 7% decrease from the 756 MMst mined in 2018. Last year's production was the **lowest** volume of coal produced in the US since the miners' strike in 1978.

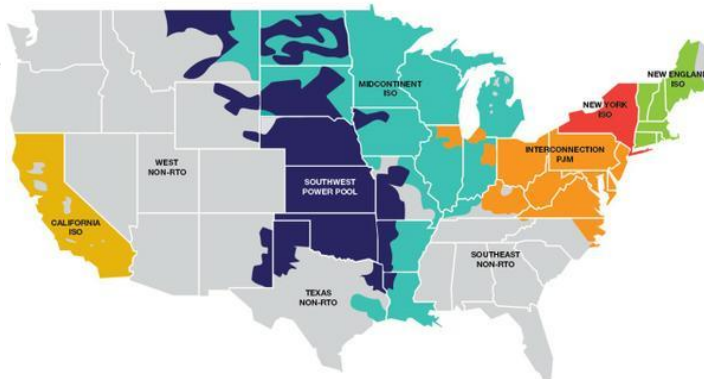


Carbon Capture: About 1,517 facilities have annual emissions that would qualify them for 45Q federal tax credits, totaling more than 2.3 billion tons of CO2 each year, or about **89% of all CO2 emissions from US industrial and power facilities.** (*Insert:* Opportunities for carbon capture retrofits in the US: **near-term; 45-Q eligible; industrial- and power-facilities.**) AES Friends have access to a [report](#) on carbon capture potential in the US.



Low Carbon Energy

- [Wind energy.](#) On March 7, and then again on April 27, 2020, the **Southwest Power Pool** (*insert*) set records for the highest share of electricity supplied by wind power in both a single-hour period (72%) and a full day (62%). Note: on average, wind power provides 29% of electricity demand in the SPP, with a low-high range of 18% (Aug) to 37% (Oct).



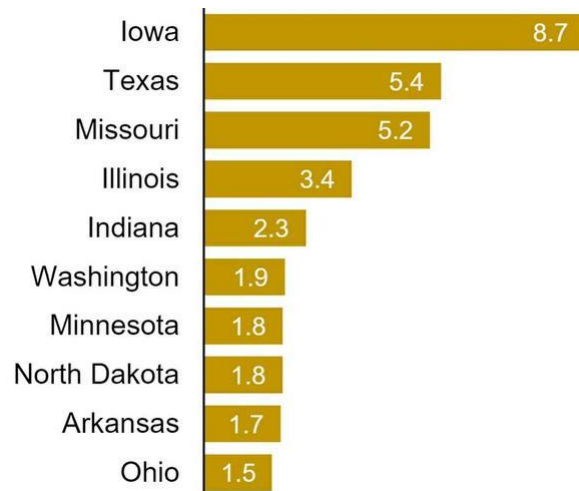
- Solar. **About 8 million tons of solar photovoltaic panels are expected to arrive at landfills globally** by the end of this decade, rising to 80 million by midcentury. Currently, there is no sufficient recycling system in place. AES Friends have access to a peer-reviewed report on [decommissioned solar panels](#).



- Solar. **The City of Los Angeles, led by the Los Angeles Department of Water and Power (LADWP), is the nationwide leader in installed solar photovoltaic (PV) systems.** Los Angeles has a total installed solar PV capacity of 483.8 megawatts (enough for 134,000 homes/year), a 15% YoY increase. The city also increased its solar PV per capita by 16.2 MW, and moved up from 105 watts per person to 121 watts per person over the prior year.

- Nuclear. A [consortium](#) of Canadian power companies have formed a joint venture – the Global First Power LP – to operate a small nuclear reactor known as the Micro Modular Reactor at the Chalk River Laboratories site.

- **Top-10 biodiesel producing states in the US** (*insert*: in million barrels). Note: Iowa has produced the most biodiesel in the nation every year on record since 2001.



Policy

- FERC has been operating with a 3-1 Republican majority since March, 2020. The Senate's Energy Committee Chair, Lisa Murkowski (Republican-Alaska) expressed frustration that the president had not submitted a Democratic nominee, as is the tradition to keep the independent federal energy regulatory agency in [balance](#). President Trump responded by nominating **Allison Clements (previously, a director at the Natural Resources Defense Council) as the Democratic nominee, and Mark Christie (previously, a Virginia State Corporation commissioner) as a Republican nominee.** A bipartisan Congress will approve both nominees.

- **A bipartisan US Congress revised the National Environmental Policy Act (NEPA)** to exclude redundant compliance requirements and review processes that delayed permit approval for inter-state infrastructure project (roads, bridges, pipelines, etc.) by seven years on average.

- **US federal officials have authorized a new rule that allows LNG to be transported by rail in bulk.** AES Friends have access to the [new rule](#) published in the Federal Register.

- Tonopah Solar Energy, which operates the **Crescent Dunes 110-megawatt concentrated solar plant about 200 miles northwest of Las Vegas, filed for Chapter 11 bankruptcy.** Ten years ago, Tonopah Solar received a \$737 million loan guarantee from the federal government and has agreed to pay back \$200 million, but it still owes about \$430 million in secured debt. The plant, which suffered technical issues and rarely generated as much power as was intended, closed last year.

- The International Trade Commission **voted unanimously to impose tariffs on wind energy towers from Canada, Indonesia, South Korea and Vietnam**. The five-member panel said those countries are unfairly undermining US producers because they are either selling at less than market value or are subsidized by their home governments.

- **The Chinese Ministry of Commerce has accused the US of distorting [crude oil and natural gas markets](#) with subsidies.**

- **Mark Zuckerberg faced a US House Congressional Committee that asked questions on why Facebook allows climate denial to thrive on its platform.**



Climate and Sustainability

- Special report, [corporate GHG emissions](#): It is fairly hard to identify a company's GHG emissions data. Perhaps the most reliable source is the CDP, or **the Carbon Disclosure Project, which publishes a two-part report about corporate GHG emissions that:** 1) grades companies A – F for their emission transparency, performance, and leadership; 2) calculates the total amount of emissions per sector:



1. **Grades:** Of the 180 companies that earned an "A" grade, only 9 were energy companies – all utilities. Oil and gas companies that earned an "A-minus" grade were Total, ENI, Repsol, Hess; "B" grades were given to Equinor, Suncor, Petrobras, Shell, and ConocoPhillips. On the other hand, about 160 companies received an "F" grade.
2. **Emissions by sector** (in MTCO_{2e}):
 - Utilities 66,925,562
 - Energy 35,654,920
 - Materials 10,943,370
 - Consumer Staples 5,983,281
 - Technology 3,965,830

Editor's note: the data is useful but somewhat flawed; for instance, energy / utility companies unavoidably have higher emissions than financial or technology companies due to their direct proximity in the value chain to higher emitting industrial processes. In other words, utilities and energy companies generate emissions in order to provide power (and emissions) used by all other sectors. (Thank you TPHCo and [Deanna Zhang](#) for this contribution.)

- The Oil and Gas Climate Initiative (OGCI) has made a contribution to **the Payne Institute for Public Policy (PIPP) at Colorado School of Mines, to develop a real-time mapping resource of natural gas flaring data.**

- The bumblebee population has been declining since the 1990s and more dramatically in recent years, in part because **species from the US East and Midwest have carried pathogens that have infected Western bumblebees**. AES Friends can download an [app](#) to document the bumblebees they observe. (There have been an estimated 14,000 submissions from all 49 states.)



Research to Markets

- *Special report: A comparison of Nikola, Tesla and diesel long-haul vehicles.* (Note: neither Nikola nor Tesla have a network of recharging/refueling stations; the Tesla Semi requires a lot of time to recharge its massive truck battery every 900 miles; diesel trucks make up less than 5% of all vehicles on the road but emit about 30% of total transport CO2 emissions.)

Vehicle:	Nikola 1	Tesla Semi	Traditional Diesel
Cost:	\$268,782	\$180,000	\$130,000
Fuel:	\$26,365 (refuel sys)	\$98,000 (lifetime)	\$37,500/year)
Maintenance:	\$66,762	\$66,762	\$66,762
<u>Cost/Mile:</u>	\$0.95	\$0.60	\$0.32
<u>CO2 Emissions:</u>	0	0 (> if coal/NG-fired)	3.24 tons (full short ton)



- The [Rivian R1T](#) electric truck will be on the market next year; **expected price: \$70,000**. (Rivian has raised \$5 billion from, among other investors: T Rowe Price, Soros Fund Management, Coatue, Amazon and BlackRock.)



- In 2019, the aviation industry used about 1.7 billion barrels of jet fuel; fuel is the airline industry's largest operating cost. Researchers at NREL are **seeking new ways to produce alternative jet fuels from waste-to-energy feedstocks** in landfills and sewage plants, which typically produce methane — the major component of natural gas and a significant global warmer. Initial experiments have produced a more potent jet fuel with 50% less CO2 emissions and as much as seven times the energy of methane, which is essential in order to get a heavy airliner off the ground. AES Friends have access to a [Waste-To-Energy](#) study.

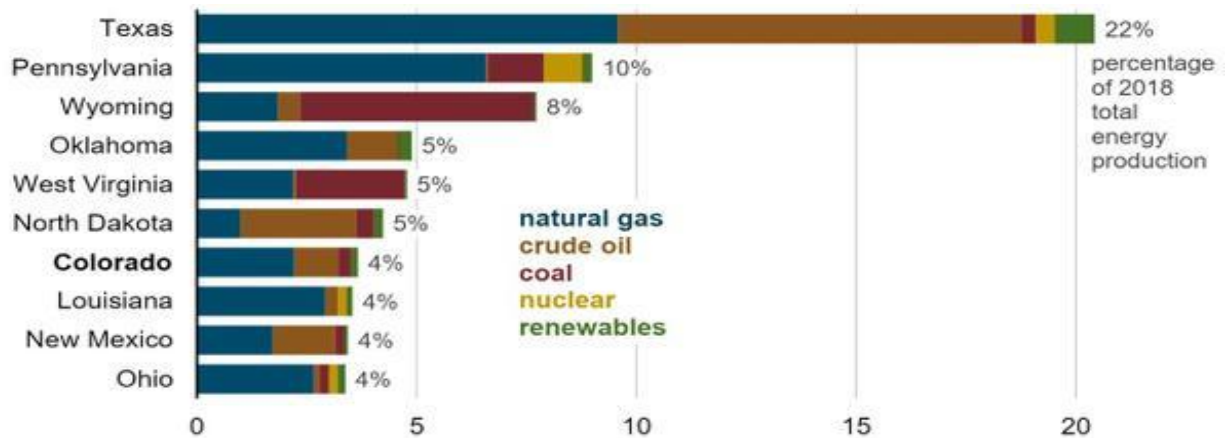
- Meanwhile, Achini Scientific has developed a way to [make jet fuel from air and water](#), which they call Green Crude.

- **Mexico is the largest importer of refined products from the US**, the equivalent of 1.2 million barrels per day, more than triple the volume a decade ago.



Electricity, Power and Efficiency

- Top-10 [energy producing](#) states:



- *Recommended resource:* **Student Energy** has revised and re-released its [Energy Systems Map](#). The producers of the map are [seeking](#) SMEs for "Production," "Conversion," and "Transport" topics in need of review.

- **Small paving changes that make roadways stiffer could reduce transportation efficiency losses and potentially eliminating a half-percent of the total greenhouse gas emissions** from the transportation sector at little to no additional cost. AES Friends have access to the peer-reviewed research on [roadway paving](#).

- AES would like to recognize the [Miller Center for Social Entrepreneurship](#) at **Santa Clara University** for its **ambitious and extraordinary global program for women**: of the 227 applicants from around the world, 17 will participate in a 6-month online program, and another 15 in its 4-month JumpStart program. The cohorts include energy-related ventures, such as:

- [Cropital](#)
- [S4S Technologies](#)
- [Nyalore Impact Limited](#)
- [Solar Aid \(Uganda\)](#)



Quotes

"President Trump is not rolling back regulations or removing environmental protections. Duplicative regulations make no sense. Why should several agencies or several states assess the exact same impact of a project? The old NEPA rule was like having to get a driver's license from 50 different states." - USEA Executive Director Barry Worthington on revision of old National Environmental Policy Act (NEPA).

- "I hope they force [Mark Zuckerberg] to confront the fact that his public statements with respect to the climate threat are undermined by his company policies that he has developed that promote the spread climate disinformation." - John Podesta (former advisor to President Obama) said about Zuckerberg appearing before Congress.