

# Energy Matters

The energy news you need to know.  
**September 30, 2019**

The official e-newsletter of ...



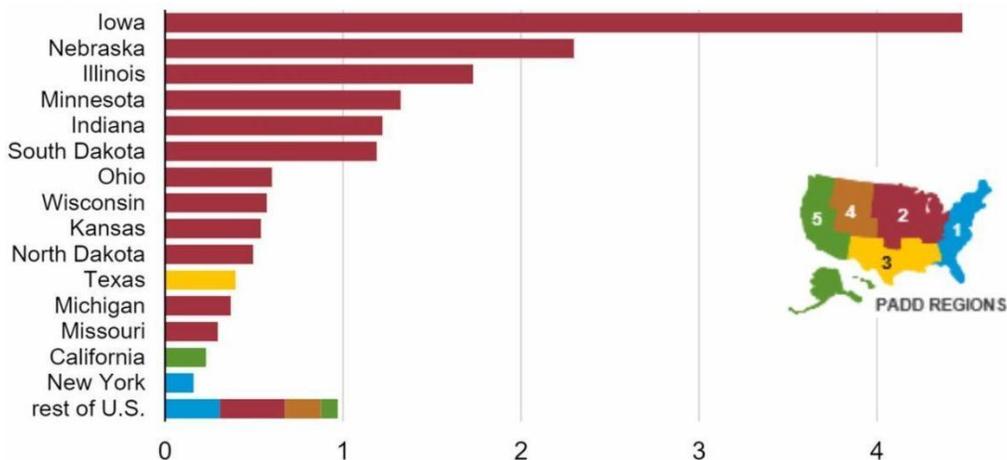
**AMERICAN  
ENERGY  
SOCIETY**

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## Headline News

### *Fossil Fuels*

**Oil:** Ethanol production in the US totaled 16.9 billion gallons last year, or about 1.1 million barrels per day (b/d). Of the top 13 fuel ethanol-producing states, 12 are located in the Midwest, and the top three states—Iowa, Nebraska, and Illinois—produce about half of the total. **Fuel ethanol production capacity by state (2019) in billion gallons/year:**



**Gas:** Natural gas-fired electricity generation in the US is on pace to increase by 6% in 2019. This rate of increase was matched in 2008, 2011 and 2014.

**Coal:** Since 2008, **the decline of coal has been offset almost 1:1 by the increased production of dry and natural gas** (9 quads vs. 8 quads, respectively). *Editor's note:* the increased production of renewable energy almost evenly matches the increase in energy consumption.

**Carbon Capture:** Energy Futures Initiative identified **33 unique carbon removal technologies**; though the report organizes these technologies by "pathways" or sectors, a significant percentage of them can also be identified as "carbon capture." AES recommends p. xvi of the PDF [EFI report](#).

## Low-Carbon Energy

- *Spotlight*, **Green Gas** :

- Biogas is a gas produced through anaerobic digestion, where microorganisms convert biomass into biogas in the absence of oxygen. It consists of about 60% methane and 29% carbon dioxide. Biogas is generally a low-quality fuel, so it not useful as a source of fuel for heating or cars.
- Once biogas is processed as pure methane, it is clean enough to be used as a transportation fuel.
- Renewable Natural Gas (RNG) is another term for biomethane.
- The [M-RETs](#) program is in the process of piloting a renewable thermal credits program that plans to have a public release on or before January 1, 2020.

**Wind:** US wind capacity additions in both 2019 and in 2020 will be near the annual [record level of additions](#) set in 2012. Related, the US will have more than 720,000 tons of wind blades and material to dispose of over the next 20 years.

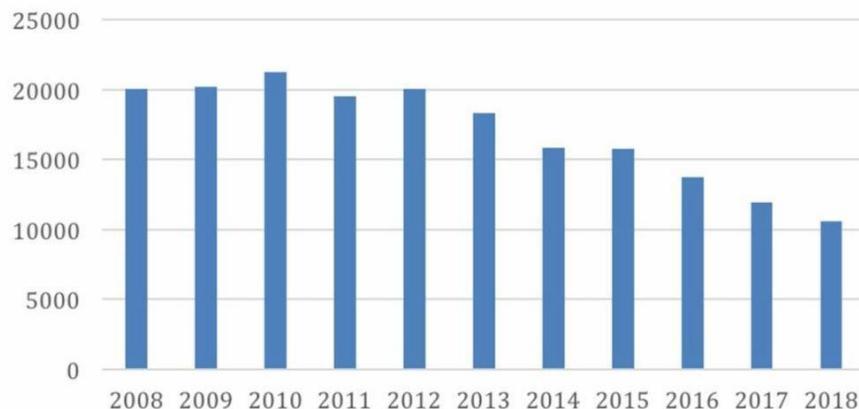
**Floatovoltaics:** A wastewater treatment pond in Auckland, New Zealand, is the site of the largest solar array in that country - providing enough power for 200 homes.

**Nuclear:** Three Mile Island Nuclear Generating Station is now shut down, permanently ( *image*). It will take about 20 years to dismantle the facility.



## Policy

- The number of **EPA inspections and evaluations during the Trump presidential administration have declined** from about 20,000/year under Obama in 2008 to little more than 10,000/year under Trump in 2018:



*Special report* - the California/Trump air-quality battle: **In the 1960s, the air quality in Los Angeles (image) and other large California cities was horrific** (about as bad as Beijing today). So, in 1969, Governor Ronald Reagan authorized the state's Air Resources Board ( *image*) and the the US Congress granted California the right to impose stricter standards on auto-tailpipe emissions as long as they were stricter than new federal rules.



The activities of the state agency and the waiver had helped California reduce emissions and significantly improve its air quality; consequently, in 1977, Congress gave all of the other states the opportunity to set their own air emission standards; instead, 22 other states and the District of Columbia decided to duplicate California's emission requirements. This special state air "waiver" has been reinstated dozens of times. **President Trump has announced plans to revoke the California waiver that limits greenhouse gas emissions from cars.** California and 22 other states and D.C. have sued in response. Then, in the escalating fight, the EPA notified California Gov. Gavin Newsom that his state is "failing to meet its obligations" to protect the environment and its water quality. AES provides a [historical summary](#) of the California waivers and an explanation of the waiver process.



### *Policy Around the World*

- Though there is very little public information available, it appears that **China is nearing completion of its own Strategic Petroleum Reserve** ( *image below*), capable of holding enough inventory to last 45 to 80 days (depending on consumption rates), or about 700 million barrels.



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### *Climate and Sustainability*

- **Highlights from Clean Energy Week in New York City** (September 23 - 27, 2019):

- Representatives from India, China, Pakistan, Bangladesh and Kenya spoke about the progress of renewable energy in their respective countries; however, all five increased coal-fired power generation relative to renewable energy generation.
- The most interesting presentations (tie):
  - Former Sec. of Energy Moniz discussed [carbon removal technologies](#).
  - [Greta Thunberg](#) excoriated world leaders for their "betrayal" of young people for failing to meet their commitments to address global heating.
- To open the event, about 4 million people participated in the September 20th [global climate strike](#); when the event ended, about half that total participated. REWRITE
- Nearly all of New York City was basically immobile due to traffic.



- According to the US Customs and Border Protection Department of Homeland Security, the primary [reason why](#) 100,000 Guatemalans migrated in 2018 and 2019 is because crop and water shortages caused extreme poverty and starvation.

- [Coral reef good news / bad news](#):

- The warming climate is not the primary cause of Florida's coral reefs dying.
- Chemicals dumped into the ocean react with hotter temperatures and kill the coral reef. (*Editor's note: a single extreme heat event will cause 15% of all coral in a region to immediately break off from a reef and die.*)

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## Research and Markets

- *Special report*: **There are 11 methane emission abatement technologies available today** (AES Premium Members have access to the [report](#) and an Excel datasheet):

- Vapor recovery units
- Blowdown capture
- Early replacement of devices
- Install flares
- Replace with electric motor
- Install plunger
- Upstream LDAR
- Downstream LDAR
- Replace pumps
- Replace with instrument air systems
- Replace compressor seal or rod

- Researchers have discovered a practical starting point for **converting CO2 into energy-rich carbon monoxide (CO)**. Stripping oxygen from CO2 to make CO gas is the first step in turning CO2 into nearly any liquid fuel for heavier modes of transportation that may prove very difficult to electrify, like airplanes, ships and freight trains. AES Premium Members have access to the [peer-reviewed research](#).

- It appears that **researchers are getting closer to the development of a battery cell with a lifetime of 6,000 cycles ... in other words, the "million-mile battery."** These new batteries do well even when run on a 0-100% discharge cycle (today's batteries do best on a 20-80% discharge cycle, which means the 1-100% discharge cycle would provide 66% more range from the same pack). AES Premium Members have access to the [peer reviewed paper](#) on the new Lithium-ion battery chemistry.

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## Electricity, Power and Efficiency

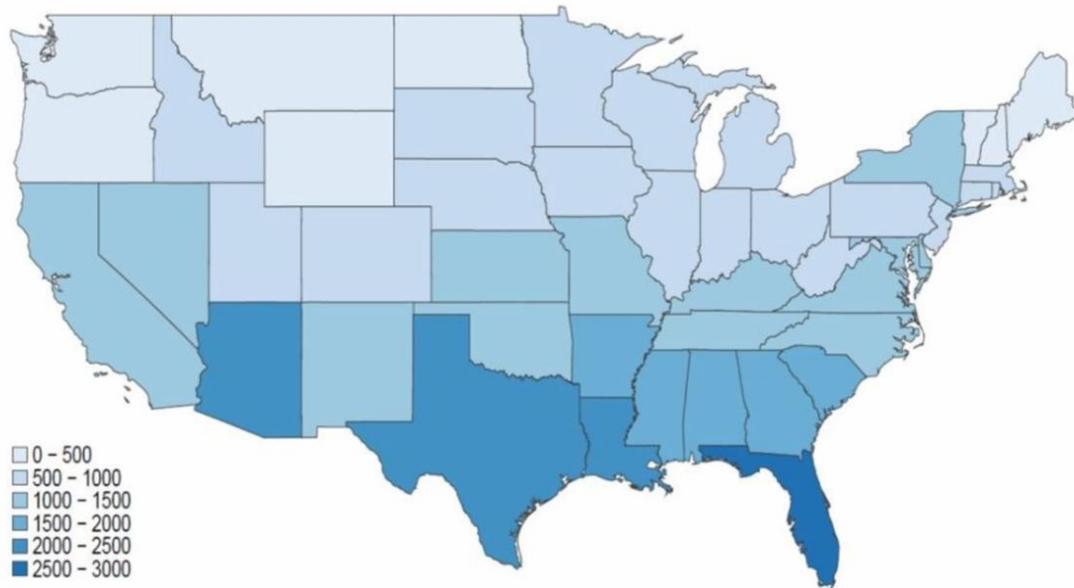
- Spotlight [energy efficiency](#) and air-conditioning

- Americans experience an average of 1265 "full-load" cooling hours per year, but there is large geographic variation. Within the continental US average annual cooling hours range from 310 in Maine to 2,771 in Florida (a 9:1 ratio).
- Differences across individual cities are even larger, from below 250 in cities like San Francisco, to 4,500 in Key West, FL.
- **AES provides Premium Members access to an [excel spreadsheet](#) that will calculate the cost of air conditioning use and efficiencies.**

- In the last 20 years, US heating degree-days (HDD) have declined and cooling degree-days (CDD) have increased (due to global warming trends). However, **the sum total of HDD + CDD has remained essentially the same**; in other words, the reduction in heating costs almost offsets the rise in electricity demand for air conditioning.

- **Improving the efficiency of an air conditioner by 10% [increases](#) the cost of the unit about \$540 (USD)**, but operational costs go down according to usage.

- Annual air-conditioning cooling hours, by state:



### *Cyber Spotlight Special*

- The five [sectors](#) most frequently infiltrated by cyberattack, in no particular order:

- utilities (grids)
- oil and gas (companies)
- retail (individual consumers)
- media (content)
- education (individual K-12 and higher ed schools).

- 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.

## 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*.

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