

Energy Matters

The energy news you need to know.

May 13, 2019

(Every two weeks)

The official e-newsletter of ...



**AMERICAN
ENERGY
SOCIETY**

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Headline News

Fossil Fuels

Oil: Special AES Report - the Middle East shuffling the geopolitical deck:

- Turkey has begun drilling offshore in the Exclusive Economic Zone (EEZ), widely recognized as belonging to the Republic of Cyprus. Cyprus is not happy with Turkey.
- Qatar, the world's largest producer of liquefied natural gas (capacity and exports) is ignoring orders from Saudi Arabia to restrict production. OPEC is not happy with Qatar.
- Iraq rarely reaches its allocated production quota, so it signed a deal with Exxon and PetroChina to develop two oilfields that border Saudi Arabia. For a variety of diplomatic, strategic, and economic reasons. Saudi Arabia is not happy.
- The Russian Minister of Energy is publicly encouraging OPEC production cuts but Russia has increased its own production. Meanwhile, Putin continues to antagonize Saudi-UAE conflict with Libya. No one is happy.



(Editor's *note*: consider the above list and other global conflicts in the context of America becoming the primary producer of oil and natural gas, a complete surprise to OPEC ... and nearly every forecaster.)

- *In case you missed it:* AES Special Report - [Fossil Tech Executive Summary](#)

Gas: *The natural gas revolution in context* - once upon a time, markets naturally paid more attention to oil than natural gas because transportation was the biggest energy-consuming sector of the economy (electricity generation was the second biggest energy-consuming sector). However, the electricity sector is now the

biggest energy-consumer, using 50% more energy than transportation. With the rise of electricity consumption, **natural gas is displacing oil as the primary source of global energy supply.**

Coal: A comparison of coal use in Australia and the United Kingdom:

Australia

- The top consumer of coal, per capita.
- The world's #1 coal exporter.
- 73% of electricity is produced by coal (13% from natural gas).
- The coal industry generates about \$42 billion YoY, the second largest sector.

The United Kingdom

- The UK did NOT use any coal power for one full week: the longest coal-free stretch since the Industrial Revolution.

Carbon Capture: The IRS is requesting comments that will help the Agency and the Treasury Department **rewrite the 45Q** carbon capture tax credit code and future regulations regarding the developing technology. The questions the IRS wants to consider:

- What requirements should apply to demonstrate that carbon oxides have been securely geologically stored?
- What rules should apply for the government to recapture the credit should carbon oxides no longer be stored?
- What can be done to clarify the meaning of terms such as “carbon capture equipment,” “qualified carbon oxide,” “qualified facility” and others.

AES Members are encouraged to [submit](#) comments.

Low-Carbon Energy

Nuclear: [Three Mile Island](#), the most famous nuclear site in the US, has announced it will officially close operations at the end of September.



Solar: The SEIA is hosting a "diversity challenge," calling on all CEOs in solar to [pledge a commitment](#) to supporting and including more under-represented people throughout the industry. AES encourages Members to sign the pledge.

Hydro: Federal energy regulators [granted approval](#) and a license this week to an Oregon pumped hydrogen energy storage project. If built, the Swan Lake North pumped storage project would have a capacity of 393 megawatts (enough to meet the demand of up to 390,000 homes) and would be the largest energy storage facility in the region.

Renewables: [For the first time, renewables generated more electricity than coal in the US.](#) *On the other hand ...* last year was the first time since 2001 that power generation from [renewable energy did not increase](#) from one year to the next.



Energy Policy - Beltway Buzz

- The House voted in favor of the [Climate Action Now](#) resolution, which would prevent the Trump administration from pulling out of the Paris Agreement, which sets strict emission goals worldwide. The Senate will not support the bill and President Trump has already said he will veto the legislation if it reaches his desk.



- EPA is finalizing its Clean Power Plan replacement, known as the [Affordable Clean Energy](#) rule. Meanwhile, Oregon's Department of Environmental Quality rejected certification of the Jordan Cove liquefied natural gas terminal, citing the Clean Water Act.

- Trump announced he might raise tariffs on \$200 billion of Chinese goods from 10 to 25%. The tariffs would not affect the energy sector but it might restrict mineral products. China has not yet decided on its response.

- Recommended resource: [Energy Tracker](#) is a comprehensive, filterable and sortable list of more than 130 energy-related federal policies related to energy and the environment, tracked by date, agency, high-level topic area, and specific issue.

- The total number of threatened or endangered species [protected](#) by presidential administrations, by annual average:

- Ronald Reagan: 32
- George H.W. Bush: 58
- Bill Clinton: 62
- George Bush: 29
- Barrack Obama: 35
- Donald Trump: 17

Note: Two US federal agencies, Fish and Wildlife Service and National Marine Fisheries Service have jurisdiction over wildlife; it takes about 12 years for the US government to make a decision on whether to formally list species as threatened or endangered.

Climate and Environment

- The Global Assessment, by the Intergovernmental Science-Policy Service, makes a case that up to **one million of Earth's estimated eight million plant, insect and animal species is at risk of extinction**, many within decades. Closest to extinction: 24 plants and animals, including two different types of bumblebees and two types of orchids, as well as the Panamint alligator lizard and the elfin-woods warbler (insert). AES Members have access to the [Assessment](#).



- In early 2018, China banned the import of plastic waste for recycling. The ban sent **the international trade in recycled materials into disorder**. Over half of the plastic - more than 3 million tons a year - used to go to China. Huge mountains of plastic are now being sent to Thailand, Malaysia and Vietnam instead.

- **The 5 countries with the highest percentage of the population that agrees with the [statement](#): Climate is changing, "but human activity is not responsible at all":**

1. Indonesia: 18%
2. Saudi Arabia: 16%
3. United States: 13%
4. Mexico: 10%
5. Australia: 8%

(Note: 5% of all people world-wide do not believe that the climate is changing at all.)

- New York filed a petition with the EPA that accused **nine upwind states of violating the Clean Air Act's "good neighbor" provisions**. The neighboring states accused by New York are: Illinois, Indiana, Kentucky, Michigan, Maryland, Ohio, Pennsylvania, Virginia and West Virginia.

- At times, **air quality at 354 of the nation's 417 national parks "is unhealthy to breathe."** The worst air is at Rocky Mountain National Park in Colorado and Sequoia National Park in California. AES Premium Members have access to the Parks Climate [Report](#). (Editor's note: the cause of the poor air quality is primarily campfires.)

- The **most at risk US Air Force bases** (flooding, drought, wildfires, desertification, etc.):

- Hill Air Force Base, Utah
- Beale Air Force Base, California
- Vandenberg Air Force Base, California
- Greeley Air National Guard Station, Colorado
- Eglin Air Force Base, Florida
- Patrick Air Force Base, Florida
- Joint Base Andrews, Maryland
- Malmstrom Air Force Base, Montana
- Tinker Air Force Base, Oklahoma
- Shaw Air Force Base, South Carolina
- Joint Base San Antonio, Texas



Electricity, Power and Efficiency

- Increasingly, electricity markets are being managed by AI. The High-Level Expert Group on Artificial Intelligence (AI HLEG) of **the European Commission established an ethics guide for use of AI to manage a grid**:

- Ultimate oversight provided by humans.
- Technical processes are proven robust and safe.
- A governing body ensures and is responsible for data privacy.
- Every activity is transparent, and humans are accountable.
- Staffing adheres to fair diversity and non-discrimination employment practices.
- AI privileges societal and environmental well-being over the needs and interests of utilities and electricity markets.

AES Premium Members have access to the European [guidelines](#) on AI for utilities.

- [WattTime](#) is using satellite imagery to **track and make public air pollution data from every single power plant in the world**, in real time.

- **Best new papers in the field of electricity/power studies:**

- Price Discrimination, Search, and Negotiation in an Oligopoly: A Field Experiment in Retail Electricity - [Leslie Martin](#) (University of Melbourne).
- Misaligned incentives in energy efficiency - [Josh Blonz](#) (Resources for the Future).
- "Out of the Darkness and Into the Light? Development Effects of Rural Electrification" - [Louis Preonas](#) (University of Chicago)
- The decline in air pollution from power plants and implications for electric vehicles - [Stephen Holland](#) (University of North Carolina at Greensboro)
- Market power and incentive-based capacity payment mechanisms - [Shaun McRae](#) (Instituto Tecnológico Autónomo de México)
- Setting With The Sun: The Impacts Of Renewable Energy On Wholesale Power Markets - [James Bushnell](#) (University of California, Davis)

Energy Security Threat Post

- According to a cryptic report posted by the US DoE, on March 5 a "cyber event" interrupted grid operations from 9 am until 7 pm in parts of the western US. If true, the event would be unprecedented - a cyberattack has never disrupted the flow of electricity anywhere in the US. AES Premium Members have access to the US DoE electric disturbance [calendar](#).
- On May 5, Israel [retaliated](#) with a physical attack on Hamas as a response to what they claim was a cyber attack. Considered one of the first physical acts of retaliation, Israel claims to have wiped out the organisation's cyber headquarters.
- Three more universities [closed](#) their Confucius Institutes (a non-profit institute that promotes the study of Chinese language and culture in foreign countries, affiliated with China's Ministry of Education). The US Pentagon has warned at least 15 universities that suspicious cyber activity had been traced to Confucius Institutes on college campuses across the US. The most recent

universities to close the programs and return China's money: San Francisco State University, University of Oregon, and Western Kentucky University.

Research and Markets

- [Malta](#) has developed a molten-salt storage technology that allows energy grids to store excess electricity. The company has benefited from a \$26 million Series A investment led by Bill Gates and Breakthrough Energy Ventures.

- The US DoE Solar Tech Office announced [\\$130 million of new funding](#), including :

- Advanced Solar Systems Integration Technologies (\$44 million)
- PV Research and Development (\$26 million)
- Balance of Systems Soft Costs Reduction (\$17 million)
- Innovations in Manufacturing: Hardware Incubator (\$10 million)
- Innovative Solar Finance (\$3 million)

- ExxonMobil will contribute \$100 million over 10 years to the National Renewable Energy Laboratory and National Energy Technology Laboratory to support RD&D of [advanced lower-emissions technologies](#), such as carbon capture and biofuels.

- Baker Hughes is introducing a new fleet of ' [electric frack](#) ' turbines that will use excess natural gas from drilling sites to power hydraulic fracturing equipment — reducing flaring, carbon dioxide emissions, people and equipment in remote locations.

- Fed Chairman Jerome Powell told Congress that the Federal Reserve is preparing a set of [monetary policies specifically for climate-change related weather disruptions to the economy](#). AES Premium Members have access to a true and correct copy of the Chairman's letter to the Senate.

- Commodity prices are rallying and US crude production is booming. But private equity is [losing interest in the fossil fuels](#), closing just four funds with \$1.4 billion in capital in the first three months of 2019. That was the sector's smallest total (in number of deals and amount of financing) in three years and a sharp drop from \$4.8 billion for a dozen funds during the same period in 2018.

Upcoming recommended events and programs:

- CalTech is hosting a week-long summer-school class in [Materials for Energy and Sustainability](#) (\$700 to register) on July 21-27, 2019.
- The [California Climate Cup](#), 2019 Start-up Challenge - Deadline is May 15.
- The [ARPA-e energy innovation summit](#), July 8 - 10, 2019; Denver, Colorado.

Features

Spotlight: Hot new energy start-ups in Houston:

- [Cemvita Factory](#) - a CO2 utilization platform mimics photosynthesis to produce nutrients as well as industrial chemicals and polymers.
- [DarkVision](#) - a new downhole imaging technology that lets oil and gas operators look inside their wells.
- [Ingu Solutions](#) - technology platform that identifies pipeline performance and safety.
- [LaserStream](#) - a laser ID that evaluates and projects corrosion of pipelines.
- [LiftETC](#) - a new artificial lift technology.
- [Oliasoft](#) - digital software that enables autonomous well design.
- [Ondaka](#) - an asset-visualization technology.
- [Syzygy Plasmonics](#) - a new chemical reactor for low-cost hydrogen production.

Quotes: Time to tone down the rhetoric?

"I think they should name the royal baby CLIMATE CHANGE IS A PLANETARY EMERGENCY." - Tweet by Sen. Brian Schatz (D-Hawaii), on birth of Baby Archie to Meghan Markle and Prince Harry



"We are in a race with China to secure minerals ... with nothing less than the fate of the future on the line." - Robbie Diamond, CEO of Securing America's Future Energy

"Arctic sea lanes could become the 21st century Suez and Panama Canals." - Mike Pompeo, US Secretary of State

"The Earth is not dying, it is being killed, and those who are killing it have names and addresses." - Utah Phillips, American labor organizer, folk singer, poet and anarchist

In case you missed it - Energy Matters, vol. 9.6

- [Gas](#): Permian drillers are flaring gas at the rate that is equivalent to the entire residential demand in the state of Texas; since gas prices are crashing right now, it is likely that the volume of flared gas is climbing. Furthermore, the amount of natural gas in storage in the US is at its [lowest](#) (1,137 billion cubic feet) in the last five years.



Contacts

- [The American Energy Society](#)
- American Energy Society [LinkedIn Group](#)
- American Energy Society introductory [video](#)
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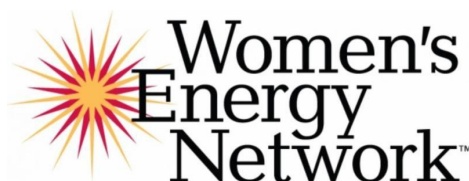
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