



ENERGY MATTERS

The trusted source for objective sound-bite summaries of the energy news you need to know

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— HEADLINE NEWS —

Conventional

Petroleum

- **The next meeting of OPEC on November 30 [could be the last](#)** for the oil cartel. If OPEC wants to regain its ability to alter global oil markets, it needs all member nations to reach *and abide* by an agreement. Failure will likely bring an end to the OPEC era and reshuffle oil markets as former members strike out on their own.

- The newly discovered [Wolfcamp Shale Formation](#) in West Texas holds 20 billion barrels of oil, 16 trillion cubic feet of natural gas, and 16 Tcf of associated natural gas - "**the largest assessment of continuous oil**" according to the USGS, nearly three times more petroleum than the agency found in North Dakota's Bakken shale in 2013.

Natural Gas

- Since 2009, enough natural gas was lost to flaring, venting, and leaks to serve more than 6 million households for a year. **AES Members have access to the Interior Department [Fact Sheet](#).**

Coal

- **Despite some evidence of a reviving coal market, it is a sector too tough to read:**

* *On one hand*, the US Forest Service will likely [allow expansion](#) of Arch Coal Inc.'s West Elk mine, a 19,500-acre area known as the North Fork Coal Mining Area, in Colorado.

* *On the other hand*, total US coal rail traffic declined 3.2% year-over-year to 92,184 carloads, and year-to-date coal rail traffic has fallen 22.9%, a continued downtrend and the largest annual decline since record keeping began in 1949.

Nuclear

- "**Nuclear fusion**" - a nuclear reaction in which two or more atomic nuclei come close enough to form one or more different atomic nuclei and subatomic particles (neutrons and/or protons). The difference in mass between the products and reactants releases a large amounts of energy (aka, the power of the sun), long touted as the ultimate solution to powering the world. A variety of advances have taken place recently in nuclear physics:

* The [Alcator C-Mod tokamak reactor](#) at MIT created the highest plasma pressure ever recorded.

* A [Chinese fusion reactor](#) managed to sustain plasma at temperatures of over 90 million degrees for 102 seconds, a temperature approximately three times hotter than the core of the sun. (Note: AES could not confirm this research in a peer-reviewed journal.)

* In Germany, the [Wendelstein 7-X experimental fusion reactor](#) created 80 million degree Celsius hydrogen plasma for a quarter of a second.

Renewables

- Sierra Nevada Brewing, Ben and Jerry's, [NIKE](#) and The Gap are just a few of the **nearly 400 companies** that have signed a joint letter to Trump and the incoming Republican Congress asking for a commitment to a low carbon future. AES Members have access to the [open letter](#).

- **Scripps Ranch in California is the center of residential solar power** -- 26 percent of all homes in the neighborhood have solar panels - the highest percentage in the world for a community that size.

- In the past eight years **the number of plug-in electric vehicle models has increased** from one to more than 20, battery costs have decreased 70%, and the number of electric vehicle charging stations has increased from less than 500 in 2008 to more than 16,000. Momentum will continue ... the US Department of Transportation is establishing [48 new national electric vehicle-charging corridors](#) on highways across the country.

- **The number of corporate power-purchase agreements for wind-produced energy has doubled year-on-year** for five years straight years.

- **Top 5 largest owners of renewable energy generation:**

1. NextEra Energy
2. Berkshire Hathaway
3. Duke Energy
4. Tennessee Valley Authority
5. New York Power Authority

- Two studies of **trends in renewable energy** (AES members have access to the reports):

* [The 2015 Renewable Energy Data Book](#) by the DoE and NREL. Summary: in 2015, renewables grew in the US and the rest of the world, whether measured by electricity generation, investments, or technology-specific data.

* [State Leadership Driving Shift to Clean Energy](#) by the Georgetown Climate Center. Summary: a dramatic shift to clean energy took place across the US between 2011 and 2014.

Policy

- **Inside the Beltway - energy-related cabinet appointments under consideration:**

* **Secretary of Energy:** Continental Resources CEO Harold Hamm is the leading candidate, but Kristine Svinicki, the sole Republican on the Nuclear Regulatory Commission and former Texas Governor Rick Perry are also being considered.

* **Secretary of the Interior:** Forrest Lucas, the 74-year-old co-founder of oil products company Lucas Oil, is seen as a top contender for Interior secretary, though venture capitalist Robert Grady and Sarah Palin are also being considered.

* **Majority Leader, Senate Committee on the Environment:** [John Barrasso](#), Senator from Wyoming, will replace James Inhofe in the next Congress.

* **Administrator of the EPA:** the short-list to [head the US EPA](#) includes two current energy industry lobbyists who held leading roles under President George W. Bush: Jeff Holmstead, an energy attorney at the Bracewell law firm; and, Mike Catanzaro, a lobbyist for CGCN.

* **FERC Chairman:** Senate Majority Leader Mitch McConnell has picked his long-term aide, [Neil](#)

[Chatterjee](#) for a seat on the five-member FERC commission. Note: President-elect Trump made infrastructure development a central part of his presidential campaign, and a fully staffed FERC could help expedite projects, notably, the approval of interstate natural gas pipelines, terminals for exporting domestic liquefied natural gas, and integration of distributed energy into the electric grid.

* **[Transition team:](#)**

Peter Thiel - Silicon Valley billionaire venture capitalist with substantial investments in nuclear fusion is encouraging greater focus on this scientific, technological, and political long-shot.

Thomas Pyle - President of American Energy Alliance (and opponent of the EPA Clean Power Plan), is head of the Department of Energy transition team.

Doug Domenech - head of the Department of Interior transition team. Mr. Domenech served as deputy chief of staff at Interior under President George W. Bush.

Myron Ebel - climate-change skeptic, will oversee the EPA transition.

- **[The Clean Power Plan will remain in limbo](#)** because the DC Court of Appeals has not issued a ruling and because the rule has never gone into effect. Playing politics, Trump will probably withdraw the rule once in office. The EPA could withdraw the Clean Power Plan *before* Trump takes office, forcing the new administration to provide a replacement regulation because the Clean Power Plan is the EPA's interpretation of its obligation under Section 111(d) to promulgate climate regulations for power plants. No doubt [the case will return to court](#).

- **The White House has started its formal regulatory [review of the national ethanol-blending mandate for 2017](#)**. The White House's Office of Management and Budget (OMB) has received from the Environmental Protection Agency (EPA) the final volume mandate for fuel refiners to blend ethanol and other biofuels into traditional oil-based fuels like gasoline.

Climate

- **For the third straight year, global carbon dioxide emissions [did not increase much](#) in 2016.**

- **Can both statements be true?**

* Stanford researchers: "Kelp forests [thriving](#) in some locations despite environmental stressors."

* The Guardian: "[Destruction of kelp forests](#) ... shows impact of ocean temperature rises."

- **COP22 Update:** Amid concerns that US President-elect Donald Trump will pull the US out of the Paris climate agreement, [almost 200 nations reaffirmed their support for the deal](#). Although the US is essentially irrelevant at the COP22 climate summit in Morocco, [other nations are copying its sweeping Decarbonization Plan](#) to shift from fossil fuels toward renewable energy.

- The Chinese Ministry of Environmental Protection said concentrations of small breathable particles known as PM2.5 - a key smog indicator - has fallen 12.5 percent in the last year. However, the World Health Organization reports that **major cities in China are registering an [annual average of 42 micrograms/cubic meter](#)**, four times the recommend maximum of 10 micrograms.

- **[Cities that will be affected the most by rising sea levels:](#)** Dakar, Senegal; Guangzhou, China; Ho Chi Minh City, Vietnam; Lagos, Nigeria; Manila, Philippines; Qingdao, China. And the country that could be affected the most is [Canada](#).

- Every additional metric ton of carbon dioxide (CO2) released into the atmosphere appears to cause **the Arctic to [lose another 3 square meters of ice](#)**.

- Cities are home to over half the world's population but produce about 75% of its carbon emissions. However, [cities have been able to reduce carbon emissions by about 23% in the last few years](#). AES Members have access to the data in the "Covenant of Mayors" report by the European Commission.

Electricity, Utilities and Power

- **A new rule proposed by FERC will allow [stored energy](#)** - such as batteries, flywheels, and distributed resource aggregations - to participate in wholesale markets run by the nation's RTOs and ISOs. AES Members have access to the [proposed rule](#) by FERC.
- FERC has also issued a [final rule](#) revising the \$1,000/MWh cap on energy supply offered in the day-ahead and real-time markets run by RTOs and ISOs. The final rule, Order 831, responds to the difficulties some generators had recovering their costs during the 2013-2014 Winter Polar Vortex.
- **PG&E's pilot [battery storage systems](#) are participating in the California ISO markets.**
- The US EIA expects that average spot prices at the Henry Hub - a liquid gas trading point often used to set market prices - will [increase by more than 20% next year](#), from \$2.51/MMBtu — the lowest in a decade — to about \$3.07/MMBtu. As a comparison, Deutsche Bank also expects Henry Hub gas spot prices to rise on average to \$3.25/MMBtu, Energy Ventures Analysis puts it at \$3.30, and Goldman Sachs predicts \$3.15. (Note: US power markets and utilities anticipate this price increase, and mild weather, will lead to a decline in revenues in 2017.)

Basic Research and Tech-to-Markets

- Scientists have injected carbon dioxide into ancient lava flows and watched it solidify, which provides **evidence that it is possible to capture carbon dioxide and store it underground** to reduce greenhouse gas emissions. AES Members have access to the peer-reviewed [article](#).
- Moody's is changing its outlook for the North American **coal industry [from negative to stable](#)**.
- **Tesla has [six product goals](#)**: provide turnkey roofing products; manufacture bigger Powerwall batteries; develop faster EV Teslas; supersize PowerPack batteries; improve solar cell technologies.
- **EnergySource has been testing a new process to [extract lithium and other metals](#)**, and the consequences could be enormous.
- Southwest Research Institute (SwRI) has been awarded \$80 million from the DoE to design, build, and [operate a pilot plant](#) to support supercritical carbon dioxide (sCO₂) power cycles.
- **Engineers are trying to transform old, petrol-guzzling cars [into electric vehicles](#)**.
- On December 15, the US Bureau of Ocean Energy Management will [auction](#) 79,350 acres offshore New York for commercial wind energy development. (NOTE: it appears that the BOEM has [already selected](#) the companies that are "pre-qualified" to participate in this open, public auction.)

— FEATURES —

Quotes

"I do believe storage is the next big game changer."
- FERC Commissioner Colette Honorable

"The fuel cell carbon capture solution we are advancing could be a game-changer."
- Chip Bottone, president and chief executive officer of FuelCell Energy, Inc.

"So, its basically a game-changer: ... a roof that looks better than a normal roof, lasts twice as long, costs less and - by the way - generates electricity."

- Elon Musk, after the merger of SolarCity and Tesla

"Small scale nuclear is ... a game changer ... but there are questions. Are they safer? Probably. Are they cheaper to build? Probably. Do we have any experience doing it? Not really."

- Mike Pasqualetti, senior sustainability scientist at Arizona State University

American Energy Society, 654 Gilman Street, Palo Alto, CA 94301