

## 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

- OPEC members must be more than a bit worried in advance of the [172nd meeting of the Cartel in Vienna on May 25](#). The oil price war, triggered almost three years ago, is far from over, and production cuts have been ineffective as a long-term strategy.
- **The [Gulf of Mexico](#) is no longer an exploration and/or production "hot-spot"** - land-based shale plays in the US have turned the tide away from the Gulf. In January 2007, 82 jackup rigs were drilling in the shallow water of the US Gulf. Now, only 11 remain.

##### Gas

- **There are 18 nations that export LNG; the top five are: Qatar, Australia, Malaysia, Nigeria, Indonesia.** The top 5 have remained unchanged since 2015, although Australia and the US ([15th of 18](#)) are rapidly gaining ground. AES Premium Members have access to the [2017 World LNG Report](#). (Note: Iran won't appear on the list until it has completed one full year of exports; however, it is holder of the world's biggest natural gas reserves, almost on par with neighboring Qatar, which produces from an adjacent portion of the same deposit.)

##### Coal

- **Nearly all publicly traded US coal companies reported [positive earnings per share](#)** in the first quarter of 2017, and the market value of publicly traded US coal companies has doubled (to \$15 billion). Salaries are growing, too: average executive pay has increased to \$200,000, up 60 percent, and miners are receiving \$1,000 signing bonuses and fully paid health insurance. And yet, the sector faces vulnerabilities - see your [AES account for a special survey of the state of coal](#).

##### Nuclear

- **Uranium prices have rebounded** - with rates rising to \$22.75/lb - after falling as low as \$18 in late 2016. Prices will [rise even faster](#) now that Kazakhstan, the world's top producer, is politically stable again; it has resumed setting uranium spot prices around the world.

#### Renewables

- A new [wind turbine](#) is installed in the US every 2.4 hours.
- [Pakistan](#) is one of the best countries for solar energy due to its arid climate and latitude.
- New support for biomass - or [wood pellet fuel](#) (considered a renewable energy source because it is

composed of trees) - was tucked into the recently passed spending bill. **Congress has directed the EPA, DoE, and the Department of Agriculture to "establish clear policies that reflect the carbon neutrality of biomass."** However, climate scientists say burning wood pellets actually produces more harmful greenhouse emissions than coal or natural gas.

- **Global investment in clean energy in 2016 was [down 17 percent](#)**, driven by the decline of the Chinese economy, the reversal of technology cost [reductions](#), and less political support in the US.

- **Warren Buffett says he has a '[bigger appetite](#)' for a solar or wind project.**

- AES conducted a sample survey of its expert Members for insight into **renewable innovations enjoying recent momentum** that are now showing promise as viable technologies:

1. *Hydrogen-based fuel cells*: Without a leader, innovation had stalled. However, truck manufacturers Kenworth, Toyota, and UPS have begun investing in fuel cell technologies and the UK appears poised to lead.
2. *Lithium-air batteries*: Development of this technology into a commercial product had stalled due to two technological hurdles such as unpredictable short-circuiting and speedy loss of battery power. However, Cornell University recently cleared the capacity problem, so there may be just one more hurdle before the battery becomes a dominant play.
3. *First Generation Smart Grid*: The US jumped on the smart grid bandwagon in 2007, then progress slowed. However, many small communities are adopting "microgrid" projects, which will allow consumer demand to drive a new phase of implementation.
4. *Tidal turbines*: This energy source has had small-scale success but has not been able to develop into a commercial product. However, Scotrenewables Tidal Power has launched a new low-cost turbine off the coast of Scotland - with a capacity of two megawatts.
5. *Space-based Solar Power*: Solar power captured from space has been a sci-fi concept since the 1970s, but the iPhone 8 wireless charging feature offers hope for reality.

## Policy

- **The Federal FY2018 budget is now scheduled to be released on May 23 at 11:00 am (EST).** AES will watch the energy-related budget lines very closely. (And the date may change again.)

- Special report. **President Trump signed an executive order calling for a [review of national monuments](#)** set aside as public land buffers to protect the National Parks. There are 23 national monuments under review. AES Members have access to the [list of all monuments under review](#).

- **The Senate narrowly and unexpectedly blocked a resolution to [repeal](#) an Obama-era rule restricting methane emissions from drilling operations on public lands** - with three Republicans joining every Democrat on the vote: Senators John McCain (R-AZ), Susan Collins (R-Maine), and Lindsey Graham (R-SC). Two Democrats who had considered backing the rule's elimination - Heidi Heitkamp (D-ND) and Joe Manchin (D-WV) - voted against the motion, as well.

- **Charming Betsy** (*noun*), definition: **A phrase that refers to the principle of interpreting national laws in the context of international law.** This principle evolved from the case, *Murray v. The Schooner Charming Betsy*, (U.S. 1804). In this case the Supreme Court observed that an act of Congress ought never to violate international law if and whenever possible. *Example*: Lawyers defending the President Obama's Clean Power Plan have based their arguments on 'Charming Betsy'; however, since neither downward revision nor withdrawal from the Plan by the US would violate international law, the Charming Betsy doctrine is [not applicable](#).

- [Daniel Simmons](#), a conservative scholar who questions the value of renewable energy, has

been [appointed to oversee](#) the EERE.

- **There is a new political organization - [314 Action](#)** (named after the first three digits of pi) that is recruiting and training prospective political candidates who have a STEM background to help them build credible campaign strategies.

- **President Trump will [not announce](#) whether the US will pull out of the Paris climate agreement until after he returns from the G7 leaders' summit in late May.** At issue is Article 4.11 of the agreement, which states that a nation "may at any time adjust its existing nationally determined contribution with a view to enhancing its level of ambition." The question is whether the ability to "adjust" is like a ratchet, allowing progress only in one direction, upward, or if it permits a country to weaken its commitment without violating the terms of the deal. The delay has provided plenty of time for the public to form and share opinions. On one side, companies like Apple, Facebook, Google, and National Grid are publicly urging the Trump administration to keep the country's original commitment and [remain in the accord](#); meanwhile, other companies and groups are urging President Trump to keep his campaign promise to [withdraw](#).

## *Climate*

- **Smog levels in Beijing reached [record highs](#).** Measurements of PM10 (a tiny inhalable particle linked to a variety of lung complaints) soared to above 2,000 micrograms per cubic meter. AES recommends the "[State of the Air](#)" report for its Members.

- **Ranking the 35 cleanest cities, by transportation:** Oslo, London and Amsterdam have eliminated the most greenhouse gas emissions from transportation. European cities filled eight of the top 10 spots, along with Tokyo and Seoul. San Francisco, in 14th, is the top-ranked city in the US. No cities in China or India are on the list. AES Premium Members have access to the [report](#).

- **Nations around the world have adopted more than 1,200 laws to curb climate change**, up from about 60 two decades ago. AES Premium Members have access to the [full report](#).

- **The level of carbon dioxide in the Earth's atmosphere continues to rise - [410.28 parts per million](#).** (For context, in the late 18th Century, around the beginning of the Industrial Revolution, that figure was only about 280 ppm; by 1958, it had risen to about 315 ppm.)

- **Methane emissions in Canada are about [2.5 times higher](#) than previously thought.**

- The oil and gas company **Santos has rewritten its business plan so that it is based on a 4C degree rise in global temperatures.** Its chairman, Peter Coates, told shareholders it was "[sensible](#)" to create a business strategy that is based on a changing climate.

## *Electricity, Utilities and Power*

- **NRG is considering [sale of all](#) its renewable energy assets** - more than 5 GW. This could be the largest-ever renewable energy transaction.

- **Ever since Thomas Edison invented the light bulb in the 1870s, electricity demand has increased steadily... until now - [demand is flat](#).**

- Power plants that incorporate renewables into the energy mix often rely on solar power during summer and wind power during winter. However, new rules require utilities to draw some renewable energy [all year](#). The rule creates incentives to incorporate more wind (it is a more reliable year-round source of

renewable energy than solar). The first test of the rule will come at next month's auction by PJM Interconnection - the grid operator that covers the region from Chicago to Washington. AES Premium Members have access to the [new rules](#).

- The Tennessee Valley Authority's **Watts Bar-2 nuclear reactor will [remain offline](#) until summer**. The 1,200-MW reactor went online in October 2016, but pump problems forced a shutdown in March. In **Michigan, utility regulators will [decide the fate](#) of Entergy's Palisades Nuclear Plant by August**. While nuclear fleets in states like New York and Illinois have access to public bailout support, that option is not available in Michigan.

- **Negative pricing is occurring more frequently in California due to expanding renewable energy production. [Operators and policy-makers don't have a solution](#).**

### *From Basic Research to Tech-to-Market*

- A Chinese-owned US solar manufacturer [filed a complaint](#) with the US Int'l Trade Commission against ... China. According to the complaint, Sunvia claims that it has suffered "serious injury" from a flood of photovoltaic products by China into the US.

- **[Bougainville](#) - the world's newest country - is open for mining of [world-class minerals](#)**. In addition to gold, silver and copper, the island also offers substantial porphyry deposits that are useful minerals for energy-related materials.

- Featured story: **The Top 10 best academic fields to begin a professional career in energy:**

6th: Safety Representative (liberal arts are acceptable)

7th: Training Specialist (STEM recommended but not required)

8th: Software Engineer

9th: Electronics Engineer

10th: Chemical Engineer

To see the Top 5 list, AES Members can log into their [personal account](#).

- **Tesla is taking \$1,000 deposits for its new solar roof tiles**. There are [two types of Tesla roof tiles](#) - a smooth glass and a textured glass - and each should cost about \$50,000 after federal tax credits and generate about \$64,000 in energy savings over 30 years. That's more expensive than a typical roof, but less expensive than a roof with solar and back-up batteries.

- **The amount of dissolved oxygen contained in water, an important measure of ocean health, has been declining** for 20 years. AES Members have access to the peer-reviewed [abstract](#).

- **The first large-scale carbon-capture project is [starting construction](#) in China**. This is the largest CCS project to begin operations - 400,000 tons of CO2 each year from two industrial plants. Seven more large-scale projects are also under development in China.

## — FEATURES —

### *Feature: [The Alt-E fund](#)*

There are very few private organizations that fund basic scientific research of topics related to clean energy. Indeed, maybe there is only one: [the Alt-E Fund](#). Its mission ("to promote scientific breakthroughs that have commercial potential") is extremely risky - this is the proverbial "valley of death" that frightens so many private investors and venture capitalists. But Alt-E has an advantage that few others enjoy - a collection of experts with backgrounds in technology and finance. Alt-E will begin funding clean-energy

scientific research before the end of 2017 as they finalize strategic partnerships and sponsorship opportunities. (Note: Alt-E is also recruiting new members to their technical advisory team!) AES admires and applauds the effort of Alt-E to address basic research funding needs while so many others shy away.

### *Quotes - Be careful what you wish for...*

"We prioritized climate change because it will be the issue that defines this century more dramatically than any other issue." President Barack Obama

"We switched on more wind megawatts in the first quarter than in the first three quarters of last year combined." Tom Kiernan, CEO of AWEA

"We expect to see more hydroelectric output." Steven Greenlee, spokesman for the California Independent System Operator (CALISO)

"It is important that solar continues its rapid growth. The global solar industry is ready to do that, and can even speed up." James Watson, chief executive of SolarPower

And,

"Negative pricing is a hard-to-fathom market dynamic." Jeff Bladen, Executive Director for the Midcontinent Independent System Operator (MISO) on the overproduction of renewable energy.

### *Sponsor Partners*

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