



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

- **If oil markets destabilize again, political unrest will be the primary cause.** About half of all crude oil shipped around the world passes through waters threatened by piracy, terrorist attack, or local government shut down. Of the seven main global crude oil routes, *five* are serious geopolitical chokepoints. [The biggest and most dangerous are:](#)

- * 17 million bpd through the Strait of Hormuz (the Persian Gulf, between Iran and Oman)
- * 15 million bpd through the Strait of Malacca (between Indonesia and Malaysia)
- * 4.6 million bpd through the Suez Canal (Egypt)
- * 3.8 million bpd through Bab el-Mandeb (Yemen, Eritrea, Djibouti, and Somalia)
- * 2.9 million bpd through the Bosphorus and the Dardanelles (Turkey)

Gas

- **The LNG export rush out of the US has begun** - the US shipped its second batch of [gas to China](#) and its [first to Japan](#). French company Total has invested \$207 million to help build the Tellurian LNG export terminal in [Calcasieu Parish, Louisiana](#). Kinder Morgan Inc.'s Elba Island LNG project, under construction near Savannah, GA, received authorization from the DoE to export 0.36 Bcf/d of natural gas to countries with which the US does not have a free trade agreement. AES Members have access to the DoE [authorization report](#).

Coal

- The US Department of Agriculture has reversed its opinion and **will allow coal companies** to [begin coal exploration and surface mining activities](#) in the North Fork region of Colorado.

Nuclear

- Nuclear power may be on the [defensive](#), but Duke Energy has (finally) received [federal approval to build two nuclear reactors](#) - for a combined 2,234 MWs - in South Carolina.

Renewables

- Congress helped the long-term outlook for both wind and solar when it passed the ITC (investment tax credit) renewal late last year; however, **the subsidies seem to have benefited wind power more than solar**. In the short-run, utilities have been launching [more wind projects](#) and scaling back or delaying solar installations.
- On the other hand, **unsubsidized solar is beginning to out-compete coal and natural gas**; new solar projects in emerging markets are costing less to build than wind, coal or gas projects. Further, solar is "[shattering](#)" previous records for quarterly installations.
- **Statoil was declared the provisional winner** of the US government's [wind lease sale](#) of 79,350 acres offshore New York. The winning bid was for \$42,469,725. Meanwhile, the nation's **first offshore wind farm opened off the coast of Rhode Island**, producing energy for the grid. Deepwater Wind built five turbines 3 miles off Block Island to power about 17,000 homes, a project costing about \$300 million.
- **Solar is still a middle-upper class option**: 49.1 million US households earn less than \$40,000 per year (or, 40 percent of all US households), and these households account for less than 5 percent of solar installations.
- **The top 10 states for new solar installations in 2016** were: California, Utah, Texas, Georgia, Colorado, North Carolina, New Mexico, Arizona, Oregon and New York. (Note: California is the first state to reach 1,000 megawatts of new installations in a single quarter.)
- **Electric vehicles, by the numbers ...**
 - * There are about 1,000,000 electric vehicles in the world, a few more than 500,000 EVs in the US, about half that in California, and about half that total in the SF Bay Area.
 - * Since 2008, EV battery manufacturing costs have [declined 70 percent](#).
 - * If half of all cars sold worldwide were electric vehicles every year for the next 20 years, *worldwide demand for oil would still [continue to rise](#) year-over-year.*

Policy

- **Special report from AES**: Historians make a big deal about a President's "[First 100 Days](#)," but in truth, **a President's last 100 days** often have greater impact and offer a better barometer of the outgoing president's legacy. Consider the flurry of activity in the final 100 days of the Obama Administration- [visit your AES web-account for greater insight](#).
 - * An offshore O&G plan that blocks new drilling leases in the Arctic Ocean through 2022.
 - * Three rules that increase O&G royalty payments to the federal government (aka, increasing the cost to drill on federal land) - AES Members have access to the new rule.
 - * Strengthening of the wetlands rule, known as Waters of the United States.
 - * Establishment of new national monuments, including in the waters off the coast of Hawaii, Bears Ears in Utah, Nevada's Gold Butte, and the greater Grand Canyon area.
 - * A new rule that protects streams and other waterways from mountaintop removal mining.
 - * A final EPA study on hydraulic fracturing, which will please no one: "hydraulic fracturing *sometimes* affects drinking water."

On the other hand...

- Attempts by the Trump administration to roll back a regulation will likely be met with a flurry of lawsuits. However, **there are four parliamentary techniques President Trump will use** to block regulations of any kind:

1. A version of the "pocket veto," President Trump will simply [ignore or stop defending regulatory policies](#) - federal agencies like the Justice Department serve at the pleasure.
2. If you haven't heard of the little-known [Office of Information and Regulatory Affairs](#), you will. Lawyers in this Executive Branch office pore over thousands of pages of federal regulations every day, and pride themselves on meticulously reviewing the fine print, even if that takes months or years. The Trump administration will use this Office to slow many of Obama's regulatory initiatives by repeatedly sending them back for additional revisions.
3. The use of the "Executive Order" by a President has a built-in weakness: what is easily done is also easily undone - with the stroke of a pen. President Barack Obama issued 263 executive orders during his eight years in office, at least 35 of them deal with climate change, energy, or the environment. When President-elect Donald Trump takes office, [revoking these executive orders](#) could be among his first acts - with merely the stroke of a pen.
4. Another powerful anti-regulatory weapon is the [Congressional Review Act](#), a 1996 law that allows lawmakers and the president to impose a death penalty on regulations they oppose.

- Energy policy around the world ...

* Eleven cities were celebrated at the C40 Cities Awards. Three of the winning cities and the categories are: 1. Addis Ababa, **Ethiopia** (transportation); 2. Copenhagen, **Denmark** (adaptation to rising sea levels); 3. Curitiba, **Brazil** (sustainability). Please see your personal AES web-account for the [full list of the winners](#), and for 2015. And 2014.

* **Canada's** Prime Minister Justin Trudeau [signed approval](#) of the Trans Mountain pipeline expansion from the Alberta oil sands to the Pacific coast, and Enbridge's Line 3 pipeline from Alberta to Wisconsin. However, the Trudeau government will not permit the Northern Gateway pipeline in British Columbia, citing the need to protect the Great Bear Rainforest.

* **China** is pushing the US to reduce carbon emissions, recognize science, live up to its pledge to contribute to the UN Green Climate Fund, and share technological innovations that reduce dependence on coal and other carbon emitting fuels.... But, at the same time, China is [mining and burning more coal, and pollution is still an epidemic](#).

* **The International Maritime Organization** (IMO) has tightened regulatory [limits on toxic sulfur emissions from ships](#); the sulfur content of maritime fuels has to be cut from a current maximum of 3.5% to 0.5% by 2020.

Climate

- The globe is hotter, the oceans warmer, polar ice is melting, coral reefs and rare species are dying, and sea levels are rising ... but [2016 wasn't only about bad climate news](#):

* Global carbon emissions have stopped increasing and have flattened - a 3 year trend; in the US, emissions are going down.

* Non-carbon-based energy sources - especially wind and solar - are booming around the world (despite a projected slow-down in the US).

* Most world leaders are addressing global warming and are focusing on oceans.

* Technology is providing potential solutions ... notable right now: "carbon capture."

* The world and the aviation industry reached an airline carbon pollution deal.

* Hydrofluorocarbons - a harmful greenhouse gas chemical used in refrigerators and air conditioners - is being phased out (though the global accord needs US Senate approval).

* The Paris COP21 Accord was formalized and (most) of the world has committed to it.

- **The oceans are absorbing most of the world's increasing heat**, with the strongest heat accumulation in the equatorial regions of the Pacific and Indian Oceans. Ocean [acidification is increasing](#) as the seas suck up increasing levels of carbon dioxide from the atmosphere and convert it to carbonic acid. AES Members have access to the peer-reviewed [abstract](#).

- In 2016, six mammals were declared officially "[extinct](#)" due to human activity:

1. Bramble Cay Melomys (Australia)
2. Pinta Giant Tortoise (Galapagos Islands)
3. Western Black Rhinoceros (Sahara, Africa)
4. Vietnamese Rhinoceros (southwest Vietnam)
5. Rabbs' Fringe-Limbed Tree Frog, nicknamed "[Toughie \(photo\)](#)" (Panama)
6. South Island Kokako (New Zealand)

- Sub-Saharan Africa is home to 17 of the 20 [countries most at risk for disruptions](#) due to a changing climate. Of the 17, all but two are at "high" or "extreme" risk.

Electricity, Utilities and Power

- In 2016, [utilities saw labor costs](#) decrease by \$0.01/Wdc, but customer acquisition costs grew, notably by 10 percent in the second half of the year.

- **What do financial advisors [see for the electric industry in 2017?](#)**

Negative. "The utility sector is "likely to be out of favor with investors in the next several years." - Jefferies LLC analyst Anthony Crowdell

Cautiously optimistic. "We will continue to see some [utilities] run pretty fast toward renewable energy and natural gas ... but it will be more state-driven." - Jeremy Fago, Power and Utility Deals Leader, PwC

Holding pattern. "Unlike 2016, utilities appear especially vulnerable to an interest rate hike in 2017." J.P. Morgan Securities LLC analyst Christopher Turnure

- The MITEI has completed its comprehensive study of the global electricity sector. The report identifies a series of monumental changes in the provision and consumption of electricity - including the emergence of distributed energy technologies - **AES Members have access to the MITEI report, "[Utility of the Future.](#)"**

- **It is remarkable that GDP has [decoupled from carbon emissions](#), but just as remarkable, energy efficiencies are improving even though energy prices are lower.**

- The Southwest Power Pool (SPP) has applied to the Department of Energy for authority to **transmit electric energy from the United States to Canada.** AES Members have access to the [application](#) in the Federal Registry.

Basic Research and Tech-to-Markets

- Researchers at the Pacific Northwest National Laboratory have found a way to [sequester carbon dioxide by turning it into stable carbonate rock.](#) [Summary:](#) inject CO2 dissolved in water a half-mile down into a particular vesicular volcanic rock—a basalt—so that the CO2 precipitates as new limestone-like rock.

- The US DoE granted a **guaranteed loan for the development of carbon capture technology** to [Lake Charles Methanol](#). Funds will be used for the construction of a CCS plant in Lake Charles, Louisiana The company plans to sell the captured carbon to Denbury Onshore for enhanced oil recovery (EOR) in the Gulf Coast region of Texas.

- Engineers at Montréal-based Hydro-Québec TransÉnergie are reprogramming wind turbine power inverters so that they emulate the behavior of synchronized spinning masses. **The technique is called "[synthetic inertia](#)."** Typically, when a big generator goes offline, it leaves the grid under-supplied, causing the AC frequency to fall. Conventional power plants respond instantly to frequency dips because the momentum of their spinning turbines, synched to the grid, resists deceleration. Engineers at Hydro-Quebec are trying to adapt synthetic inertia to wind-turbines.

- NASA has developed a very detailed **visualization app that [shows atmospheric CO2](#)** circulating around the world.

- **NRG Energy has [acquired the wind and solar assets](#) of bankrupt SunEdison.** The acquisition adds more than 1,500 megawatts to NRG's 50,000-megawatt portfolio.

— FEATURES —

Features: Ben Van de Bunt and Cypress Creek Renewables

In 2012, the American Energy Society happened to connect with a new Member who had joined recently - Ben Van de Bunt. At the time, Ben was exploring the burgeoning renewable energy industry and considering options. In casual conversation, he suggested that the American Energy Society should rely on a data-driven strategy to identify important news and trends across energy sectors. A few years later, Ben became Board Chair of [Cypress Creek Renewables](#), and led a new data-driven strategy to identify and acquire underutilized land on which to build utility-scale solar arrays. The approach paid off ... immediately: growing from a small, regional company of less than 20 people, Cypress Creek now has more than four GW of developed solar, almost \$2 billion in CCR committed capital, and participation in more than 200 solar energy generation assets (over \$5B). With a "build goal" of more than 1 GW of renewable energy capacity in 2017, Cypress Creek has quickly become a leading developer of small-scale utility solar farms. It turns out, Ben's early recommendation to rely on a data-driven strategy also helped the American Energy Society grow from 9,000 individuals to more than 100,000 *engaged* Members, add new publications and events, and set an ambitious "build goal" of surpassing 200,000 in 2017, which would establish the American Energy Society as a leading professional association for energy. We would like to recognize Ben for his leadership at Cypress Creek and his valuable advice for AES.

Quotes - the Janus face of energy in a nation divided:

"If Trump turns off the satellites, California will launch its own damn satellite."

- California Governor Jerry Brown

"The policy of the State of Nevada clearly supports the development and growth of diverse forms of solar and renewable energy as a priority."

- Public Utilities Commission of Nevada, on the possibility of re-instating net-metering

"Cutting basic earth science at NASA is like toppling dominos; when that first domino falls, all these other agencies and programs will fall, all the way down to the people making decisions...."

- Brenda Ekwurzel, a senior climate scientist and director of climate science at the Union of Concerned Scientists

Versus

"The future of the energy industry will no longer be driven by the West."
- Ken Medlock, senior director of Rice's Center for Energy Studies

"The only thing more shocking than this reckless ... last-minute gift to the extreme environmental agenda is that President Obama had the nerve to claim he is doing Alaska a favor."
- Senator Lisa Murkowski, R-Alaska, on banning drilling in federal waters offshore Alaska

"He will be drinking from a fire hose with respect to canceling lots of environmental regulations."
- Brendan Collins, a colleague of Oklahoma Attorney General Scott Pruitt, President-elect Donald Trump's nominee for U.S. EPA administrator

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