May
2018

ENERGYnews

Monthly News from the Commerce Energy Division

Washington State's Vision for Energy System Transformation

In April, Commerce's Director, Brian Bonlender spoke at the IEEE-Northwest Energy Systems Symposium. The following is our summary of his speech.

He discussed the many changes occurring in the electric energy industry. In Washington, we have a vision for our energy future—choosing strong, progressive policies based on what makes sense for our state and regional energy systems, environment and the long-term sustainability of our economy.

The changes shaping Washington's electric systems today include:

- **Market forces**. Clean, renewable electricity technologies have seen large price decreases. Bloomberg Energy noted that over the last decade, the price of solar modules has declined by 92 percent.
- **Resilience**. Climate change is reshaping how we change our electricity infrastructure, with electricity resilience as the major goal of system development. Deploying microgrids and increasing distributed and clean energy technologies are of the greatest importance.
- **Risk-sharing** between states and utilities is growing. Thanks to the clean energy of our hydroelectric system, Washington has the lowest electricity prices in the U.S. We are able to integrate power from intermittent, renewable sources. We value our clean power system and are working to make the future system better.

Thinking globally is a hallmark of Washington state energy policy. Promoting clean energy policies continues to be a top priority, tapping business and industry to help imagine the possibilities and take hold of economic opportunities. The focus to move Washington forward to a low-carbon economy is driving our energy investments.

The legislature established the first **Washington Clean Energy Fund** in 2013, investing in research, development and demonstration of clean energy technologies. The projects we fund reduce harmful carbon pollution, reduce energy costs, save energy and help create jobs.

The Clean Energy Fund is taking us towards new ways to integrate intermittent renewables in our evolving our hydroelectric system. The smart grid technologies focus on demonstrating as many different types of battery chemistries and storage systems as possible. Importantly, the projects include collecting data to compare the range of uses in real-world scenarios. The state's initial investment in grid modernization has leveraged upwards of $100 million in additional investment.

The value of public-private collaboration in Washington helps us stand out among other efforts around the nation. We are not looking at technology just for technology's sake. We are looking at what makes sense in support of the transformation of our electric system. No other state has the same combination of shared vision, environmental values and culture of innovation that Washington State has.

The recent legislative session provided more money and added two new programs, solar grants, which focus on community solar; and electrification of transportation grants that will go to local governments and electric utilities to work with research organizations and business.

From the state perspective, we will continue an open, independent path towards a clean energy future and we will look at how this strengthens all of our communities.

US Dept. of Energy Awards

USDOE's Small Business Innovation Research (SBIR) and Small Business Technology Transfer awards have been announced for 2018 Phase 2 Release 1.

Congratulations to the following grantees:

Olympic Research, Inc. of Port Townsend, WA (Controlled-Porosity Ceramic Materials for High Temperature Downhole Applications).

Vista Clara Inc. of Mukilteo WA (Dynamic NMR Logging Technologies for High-Resolution Measurement of Hydrogeologic Properties and Soil Response).

Congratulations also to ThorCon of Stevenson WA. They are receiving a $400,000 GAIN technology Development cost shared voucher to work with Argonne National Laboratory on electroanalytical sensors for liquid fueled fluoride molten salt reactors..

Building Bridges Out of Poverty

Our Washington State Weatherization Assistance Program staff are getting together in Phoenix the week of May 21st with their western states co-workers to learn the latest in weatherization and building science at the 2018 Energy OutWest conference. One thing you might not have expected them to talk about, though, is poverty – how it moves through generations, how it limits people's choices and how we can better serve families in poverty.

That's the focus of a special eight-hour immersion training Britt Pomush, Commerce Weatherization Manager, is leading for program managers around the West.

Drawing on her pre-weatherization experience in community service programs, Britt will explore the causes of poverty and often-hidden obstacles that people must overcome to leave it. Most importantly, she'll share tips on how to better communicate with people living in it.

"Poverty frames their whole experience", Britt explains. "It affects everything from having enough energy to change their new furnace air filters to finding time to go to an office and fill out paperwork for our program."

Is it worth it to take the time to explore the culture of poverty? Yes, says Britt. "Developing realistic expectations, taking extra time to explain and demonstrate how to maintain their new improvements – it's all is in our self-interest. If nothing else, it protects the investment in energy improvements and keeps our field staff from burning out."

The "Bridges Out of Poverty" curriculum Britt is teaching has been used since 1999. It was written by Dr. Ruby Payne, an educator and author who specializes in the culture of poverty and its relationship to education.

Welcome Hans Berg!

The Energy Division's Energy Contracts and Programs (ECAP) Unit is pleased to announce that Hans Berg is joining us as the Energy Contracts Supervisor. ECAP manages the Clean Energy Fund, the Solar and Energy Efficiency Grant Program and other energy related contracts.

Hans joined Commerce's Housing Improvements and Preservation

(HIP) Unit in 2014. As HIP's Weatherization Leverage Manager, Hans helped administer Weatherization programs with Bonneville Power Administration, Department of Energy, Health & Human Services and WA State Energy Matchmakers funding.

He also served as their lead on the Weatherization plus Health and low-income renewable energy. Prior to working for Commerce, Hans worked for the Community Action Partnership Association of Idaho as their Energy Programs Coordinator.

Weatherization Agency Staff Leads on New Technology

We are lucky to have a talented workforce of experienced building professionals running and managing our 24 local weatherization programs around Washington State.

One of these professionals is Charlie Rogers, Property Rehabilitation Specialist with Homewise, at the City of Seattle Office of Housing.

Charlie was recently profiled on the cover of "Accelerate America" magazine for his work on CO2 Heat Pump Water Heaters, a new energy saving technology he's been trying in low-income multi-family properties in Seattle. The CO2 technology uses a refrigerant that avoids the greenhouse gas impacts of traditional refrigerants.

Charlie came to the Low-Income Weatherization Program network from running his own consulting firm offering third-party home energy inspections and audits.

Events Coming Soon

Efficiency Exchange 2018—Tacoma, May 15-16

NW Power Markets Conference—Seattle, May 16

Energy OutWest—May 21-25, 2018

CleanTech Innovation Showcase 2018—Seattle, June 25

47th Annual National Solar Conference—Boulder CO, Aug 5-8

Renewable and Conservation Project Review under I-937

The Energy Office provides advisory opinions on renewable or conservation projects to see if they meet the law requirements under the Energy Independence Act of 2006. Utilities and project developers can find out if a renewable or conservation project meets the targets by applying for a review.

Currently there are six pending solar applications posted on our advisory page.

Comments on these applications should be submitted by May 11, 2018.

OR Solar 3, LLC
OR Solar 5, LLC
OR Solar 6, LLC
OR Solar 8, LLC
Chiloquin Solar LLC
Tumbleweed Solar LLC

The Energy Independence Act (EIA) requires utilities serving at least 25,000 retail customers to use renewable resources and undertake cost-effective energy conservation.

Our office also issues advisory opinions for renewable projects that want a "Washington eligible" indicator on their renewable energy credits. This process is described on our WREGIS web page.

Entities proposing to sell renewable energy or credits to an investor-owned utility may request a declaratory order from the Washington Utilities and Transportation Commission (UTC).

Washington State Department of Commerce
1011 Plum St SE
Mail Stop: 42525
Olympia WA 98504-2525
Phone: 360-725-3112
To sign up for the newsletter send an email to:
energy_policy@commerce.wa.gov

Rather read the highlights on a blog?
We're at http://www.commerce.wa.gov/energy-blog/

Solar Hot Water

River & Snow Pack Info

Observed April stream flow at The Dalles: 126% of average.

Observed April precipitation above The Dalles: 128% of average.

Est. 2018 Final runoff at The Dalles (Jan.—August):

117.4 million acre-feet

116% of normal

Estimated regional snowpack: 112% of normal.

Federal hydropower generation in March:

10,342 aMW

5-year average: 11,007 aMW.

Reservoir content (Libby, Hungry Horse, Grand Coulee, Dworshak) April:

36.1%

5-year average: 53.7%.

Energy Price Overview

Petroleum: Crude oil prices increased slightly during the month of April.

While U.S. oil production has continued to increase during 2018, there were declines in other countries such as Venezuela and Nigeria.

The average West Texas Intermediate price for April was about $65 per barrel, while international Brent averaged approximately $69 per barrel.

Transportation Fuels: Transportation fuel prices at the national level increased quickly during April, in part due to steadily rising crude oil prices. The national average gasoline price is about 35 cents per gallon higher than last year at this time.

During the spring, refiners start producing summer blends of gasoline which are less volatile and cost slightly more. National gasoline and diesel were $2.80 and $3.13 per gallon respectively.

Washington state average gasoline price for the same period (relative to the last week of March) increased by 11 cents, to $3.26 per gallon, while diesel increased 16 cents to $3.40 per gallon

Natural Gas: The average Henry Hub natural gas price increased 12 cents to $2.80 per MMBtu in April. Locally, the average April natural gas spot price at the Sumas hub averaged $1.86 per MMBtu.

The winter of 2017-18 was colder than recent winters and has driven gas storage down to levels not typically seen. National gas storage levels decreased 18 Bcf last week and are at 1,281 Bcf: about 29% below the 5-year natural gas storage average for this time of the year.

Gas storage in the Pacific region was 24% below the 5-year average.

Electricity: Spring runoff (see river flow data on page 9) and high hydropower generation in the Northwest pushed electricity prices lower during April.

The Mid-Columbia spot market price was down 5% and averaged $18.9 per MWh during April.

Current snowpack is 112% of normal and the current forecast 2018 runoff is at 116% of normal (see river and snowpack report on page 9).

Federal Funding Opportunities

MARINE & HYDRO

The Office of Energy Efficiency and Renewable Energy, Water Power Technologies Office has issued a funding opportunity:

- FOA0001837 Marine & Hydrokinetic Technology Advancement and Data Dissemination (Notice of Intent)

BUILDING EFFICIENCY & LIGHTING

USDOE Building Technologies Office issued two funding opportunities:

- Buildings Energy Efficiency Frontiers & Innovation Technologies. DE-FOA-0001825 There is a webinar on May 8, 2018 (register here).
- Solid-State Lighting Research DE-FOA-0001823. There is a webinar for this on May 7, 2018 (register here).

SOLAR ENERGY

- Funding Opportunity Announcement: FY 2018 Solar Energy Technologies Office - Full applications due June 26, 2018

ARPA-E ELECTRICITY STORAGE

- DE-FOA-0001906: Duration Addition to Electricity Storage (DAYS) - Full applications due July 2, 2018.

VEHICLE TECHNOLOGY

- DE-FOA-0001919 Advanced Vehicle Technologies Research Funding, Concept due 5/29/2018.

BIOENERGY RD&D

DOE's EERE Bioenergy Technologies Office have issued 5 funding opportunities. Most have letters of intent due May 30th and applications due by June 27, 2018

- DE-FOA-0001916 BioEnergy Engineering for Products Synthesis
- DE-FOA-0001908 Efficient Carbon utilization in Algal Systems
- DE-FOA-0001926 Process Development for Advanced Biofuels and Biopower,
- DE-FOA-0001917 Affordable and Sustainable Energy Crops
- DE-FOA-0001919 Co-Optimization of Fuels and Engines, Concept due May 29th, application due July 13

Energy Headlines and Videos

Alternative Fuel and Electric Vehicles

Sweden installs section of electrified road—Tech Xplore

Port of Seattle Announces Partnership for Sustainable Aviation Fuels at Sea-Tac Airport—Port of Seattle

Coal

Longview coal project says it will appeal latest permit defeat—Portland Business Journal

Energy Efficiency

4 net-zero energy lessons from Colorado—GreenBiz

Better Buildings Challenge SWAP: General Motors and L'Oreal USA—US Dept of Energy, Better Buildings

Renewables

California Has Too Much Green Energy—Daily Caller

Production Cost of Renewable Energy Now 'Lower' Than Fossil Fuels—Forbes

Americans ramp up use of solar, wind energy—Tech Xplore

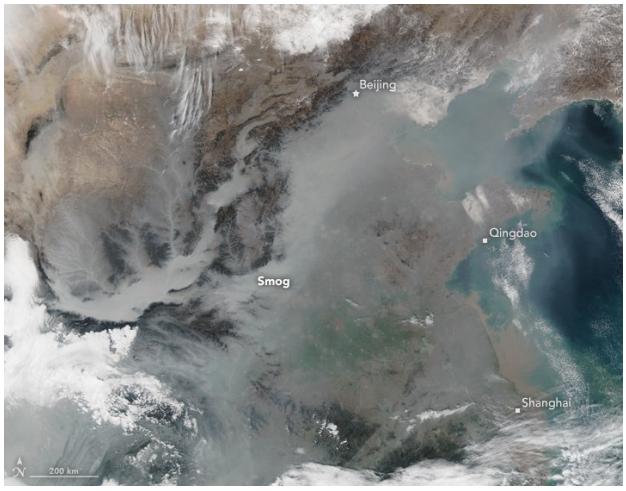
Solar

Rooftop Solar Technical Potential for Low-to-Moderate Income Households in the United States—NREL—Potential for Rooftop Solar in the US is nearly 1,000 TWh. Low to Moderate opportunity is about 42% of this total.

The stories behind the numbers: SEPA's Top 10 lists track solar and storage growth in unexpected places—SEPA

10 Sunny States Get Failing Grade for Rooftop-Solar Policies—MENAFN

Smog Smothers Solar Energy in China—Earth Observatory



Smog over China

Grid

Seattle City Light Selects Location for $3.3 Million Solar Microgrid Project—CleanTech Alliance

Miller Community Center Selected for $3.3 Million Solar Microgrid—Seattle.gov

Other

Energy Department Predicts How Extreme Climate and Weather will Disrupt US Energy Systems—Forbes

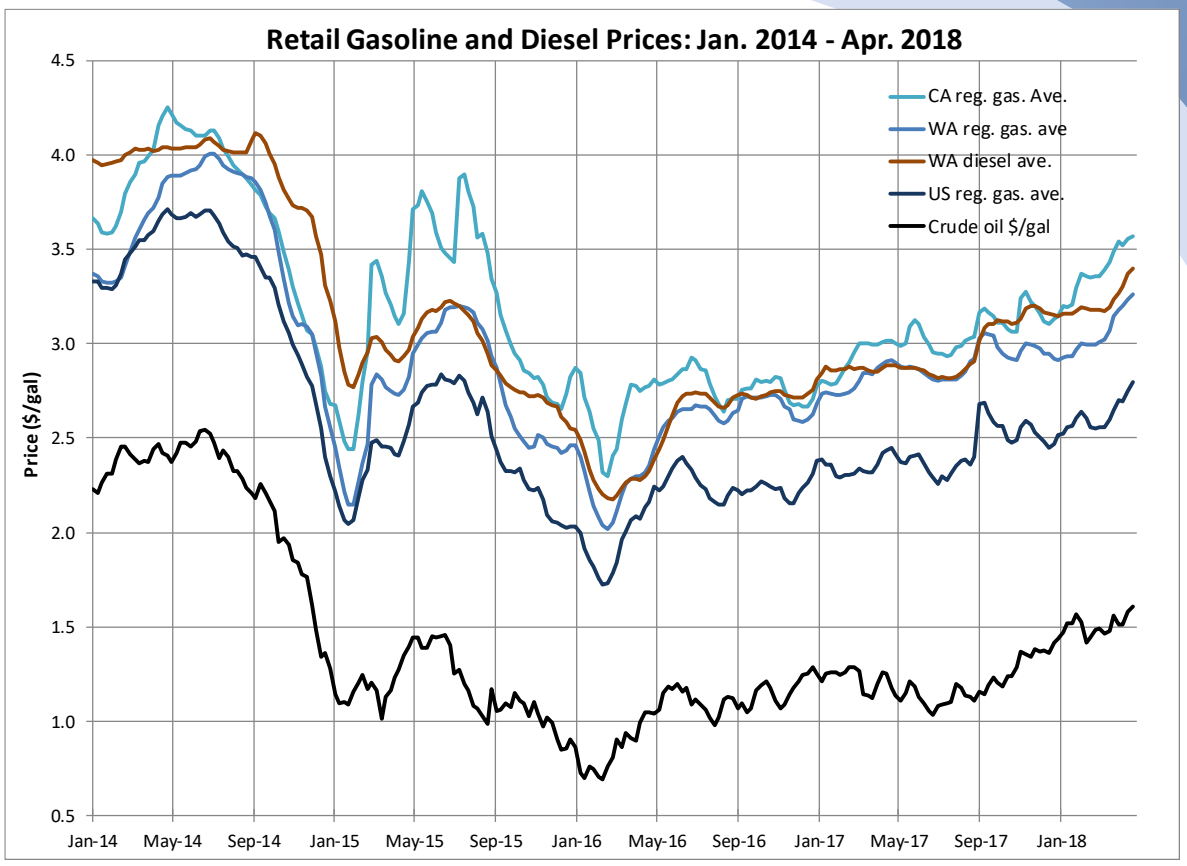
Battery storage is reaching the point of no return—GreenBiz

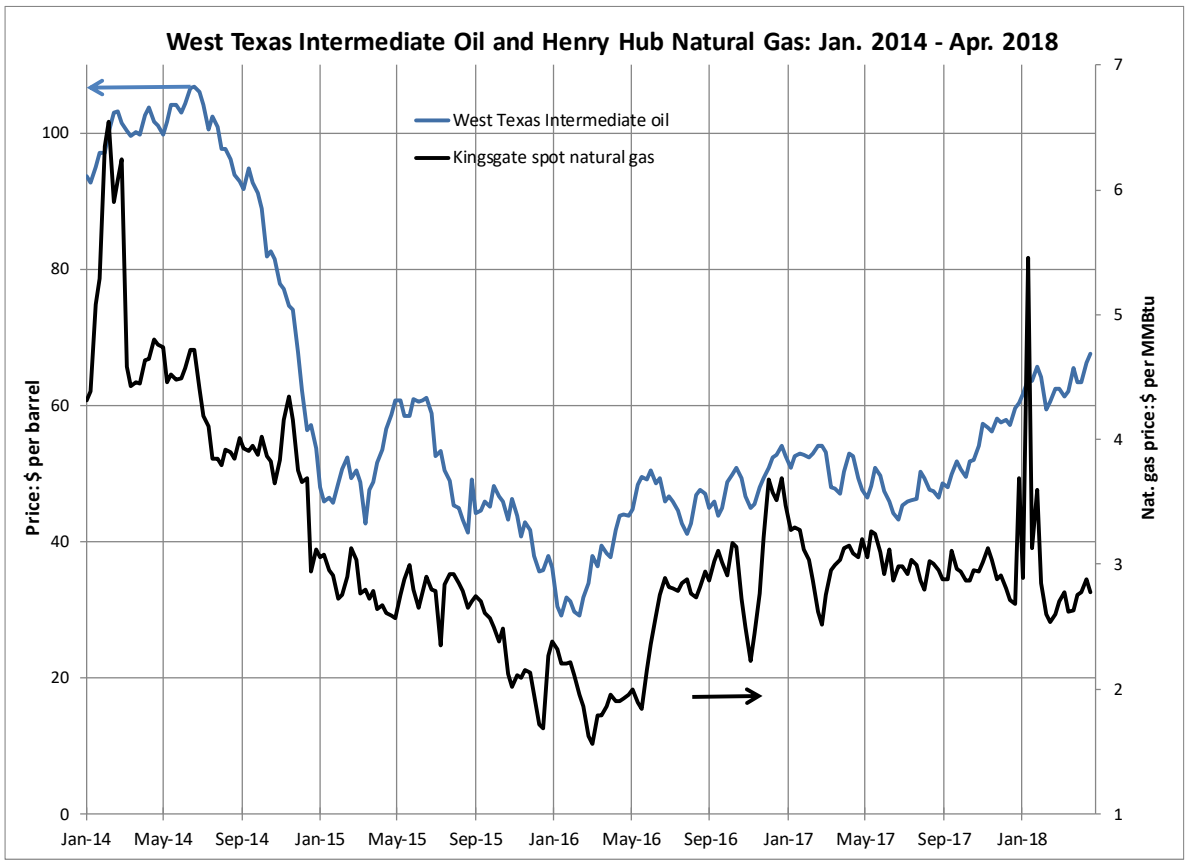
Water-based battery stores solar and wind energy—ScienceDaily

Oregon company on the forefront of nuclear energy production—KGW8News

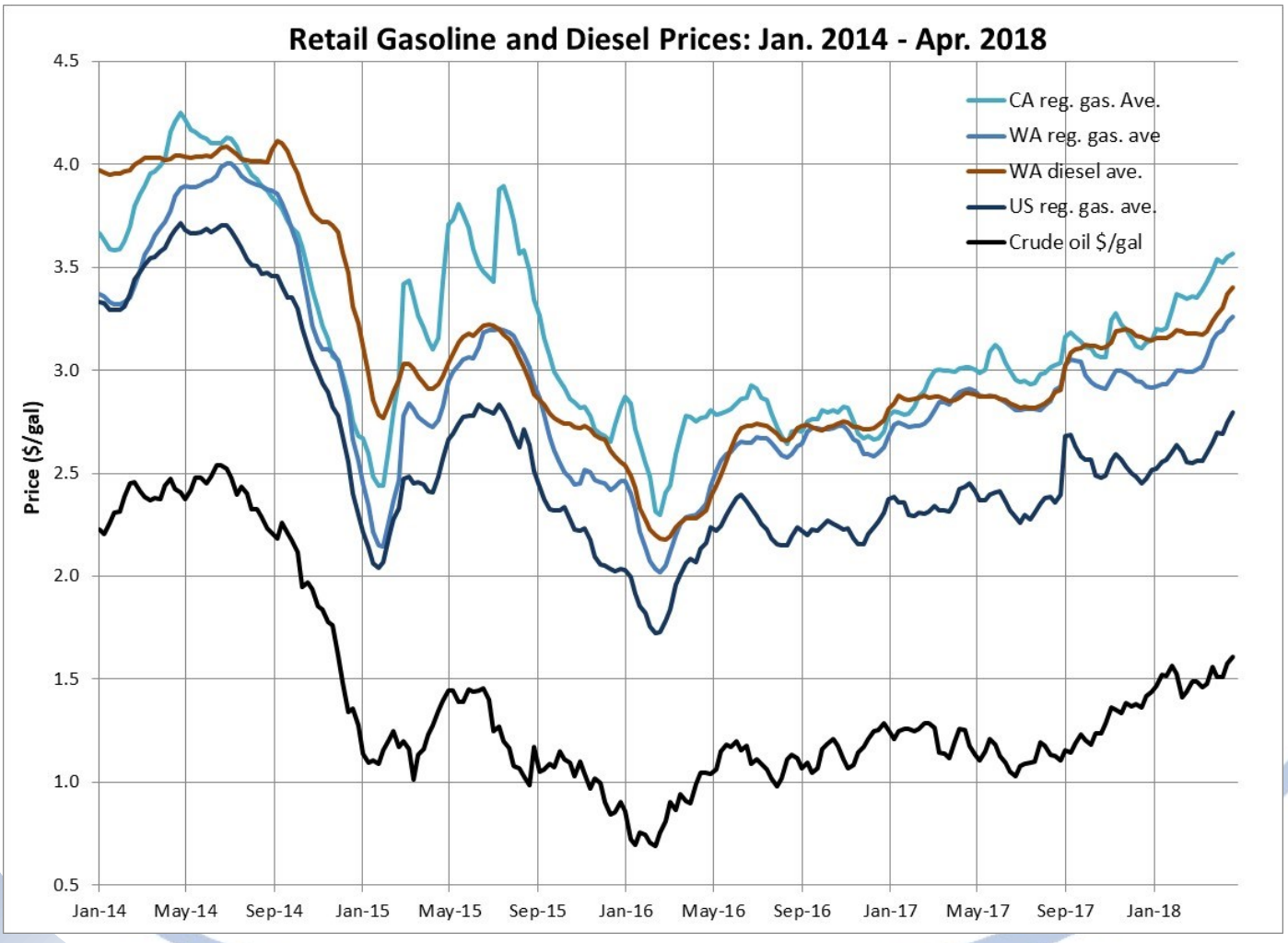
NuScale Power's Small Modular Reactor Becomes first ever to Complete Nuclear Regulatory Commission's Phase 1 Review –Business Wire

The stunningly lopsided growth of wind power in the US, in 4 maps—Vox


Retail Gasoline and Diesel Prices: Jan. 2014 - Apr. 2018
Price ($/gal)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
Jan-14
May-14
Sep-14
Jan-15
May-15
Sep-15
Jan-16
May-16
Sep-16
Jan-17
May-17
Sep-17
Jan-18
CA reg. gas. Ave.
WA reg. gas. ave
WA diesel ave.
US reg. gas. ave.
Crude oil $/gal


West Texas Intermediate Oil and Henry Hub Natural Gas: Jan. 2014 - Apr. 2018
Price: $ per barrel
Nat. gas price: $ per MMBtu
100
80
60
40
20
0
7
6
5
4
3
2
1
Jan-14
May-14
Sep-14
Jan-15
May-15
Sep-15
Jan-16
May-16
Sep-16
Jan-17
May-17
Sep-17
Jan-18
West Texas Intermediate oil
Kingsgate spot natural gas

Energy Price Summary, April 2018	Current	Month Ago	Year Ago
Monthly Range at Mid-C (Peak: $ per MWh)	8-26.5	13-33	-0.3-20.4
Average Mid C price (Peak hours $ MWh, current month)	18.9	20.3	13.5
Electricity WA Ave. Retail: February (cents/kWh)	8.16	8.12	7.91
Natural gas Kingsgate spot price (next day: $ per million BTU)	1.85	1.93	2.41
Natural gas Sumas futures price (next month $ per million BTU)	1.92	1.72	2.51
Natural gas Sumas monthly average: February ($ per million	2.43	2.76	2.89
Natural gas H.H. futures (NYMEX next month: $ per million BTU)	2.80	2.70	3.18
E85 (national average: $ per gallon gasoline)	2.70	2.56	2.51
Ethanol (CBT next month contract: $ per gallon)	1.47	1.45	1.48
Corn (CBT next month contract: $ per bushel)	3.95	3.73	3.68
Petroleum, West Texas Intermediate futures ($ per barrel)	65.1	62.8	51.3
Seattle gasoline price ($ per gallon, last week of the month)	3.35	3.24	2.96
Gasoline futures (NYMEX next month: $ per gallon)	2.05	1.91	1.68
State diesel price ($ per gallon, last week of the month)	3.40	3.24	2.89
Heating oil futures (NYMEX next month: $ per gallon)	2.07	1.92	1.59
U.S. residential propane price report ($ per gallon)	2.19	2.01	1.78
Clean Cities: Alternative Fuel Price Report, January 2018	**Current qtr US avg**	**Current qtr west coast**	**Last qtr avg west coast**
Ethanol E85 ($ per gas gallon equiv.)	2.68	3.29	3.25
Biodiesel B20 ($ per diesel gallon equiv.)	2.90	3.07	2.85
Biodiesel B99-100 ($ per diesel gallon equiv.)	3.83	3.97	3.80
Compressed Natural Gas ($ per gas gallon equiv.)	2.17	2.45	2.44
Propane ($ per gas gallon equiv.)	3.88	4.06	4.16



U.S. Energy Information Administration

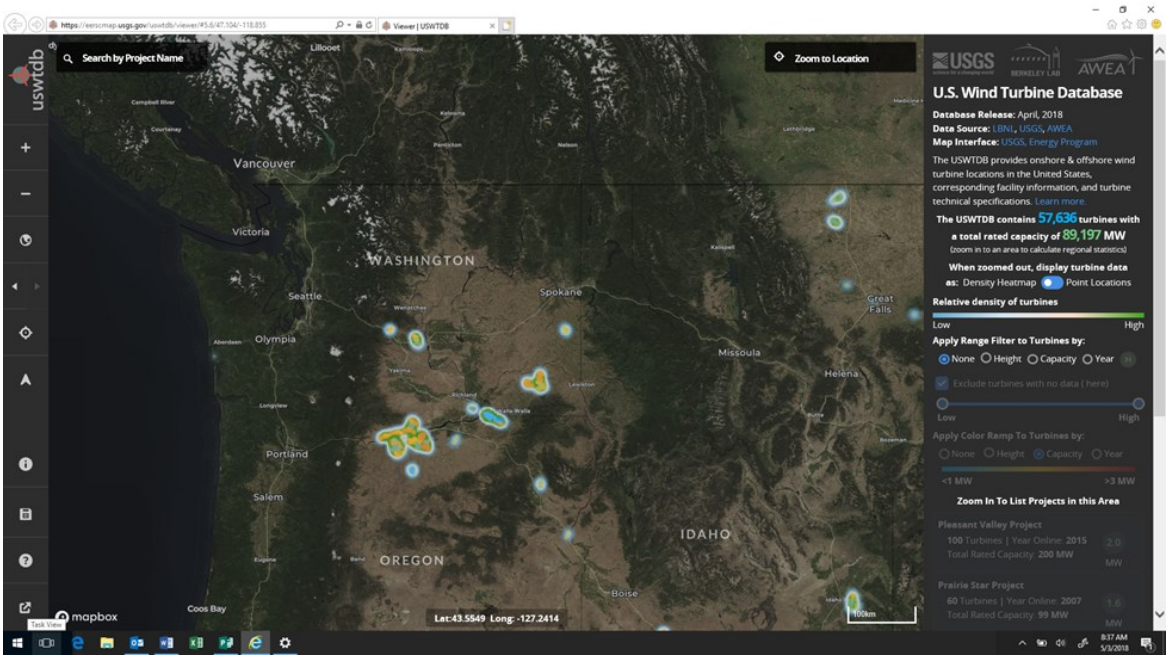
- Annual Energy Outlook 2018
- Electric Power Monthly
- Monthly Biodiesel Production Report
- Monthly Crude Oil and Natural Gas Production
- Monthly Energy Review
- Monthly Solar Photovoltaic Module Shipments
- Natural Gas Monthly
- Petroleum Marketing Monthly
- Petroleum Supply Monthly
- Short-term Energy Outlook
- State Carbon Dioxide Emissions
- This Week in Petroleum
- U.S. Wind Turbine Database

US Wind Turbine Database

The US Geological Survey, Berkeley Lab and the American Wind Energy Association have worked together to create a wind turbine database which is accessed by map viewer at https://eerscmap.usgs.gov/uswtdb/viewer/#3/37.25/-96.25

This system currently lists 57,636 turbines with a total rated capacity of 89,197 MW. It provides onshore and offshore wind turbine locations in the United States, corresponding facility information and turbine technical specifications.

Searching the database for a wind project in our state, **Wild Horse** shows 209 turbines with a total rated capacity of 363 MW.



Regional Power Flow		
Intertie	**Average**	**Direction**
California (AC+DC)	4,460 mw	export to California
Canada (BC)	1,035 mw	export to Canada
Total	5,495 mw	export

River Data		
Data for Nov. 7	**Outflow (kcfs)**	**Ave. outflow for last 10 years (kcfs)**
(Snake) Lower Granite	115.5	86.2
(Columbia) The Dalles	314.4	242.1