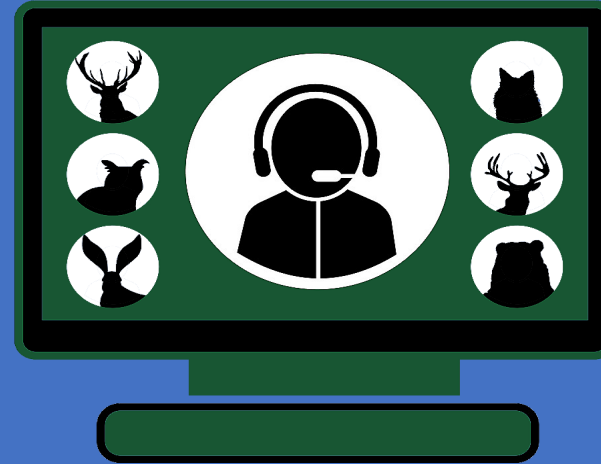




Montana Environmental Information Center



The Quarantine Series

Brian Fadie, Clean Energy Program Director

**Montana Renewable Energy 101:
How Renewable Energy Can Power Our Future**



Do Montanans Like Clean Energy?



Montanans Love Clean Energy!



Solar Jobs Rally at Montana Capitol

- 86% Support increasing wind
- 90% Support increasing solar
- 95% Support increasing energy efficiency

Source: "Montana Voter Attitudes on Energy and Conservation" (2016)



Does Montana Have a Lot of
Clean Energy to Produce?



Montana Has Abundant Clean Energy Potential!



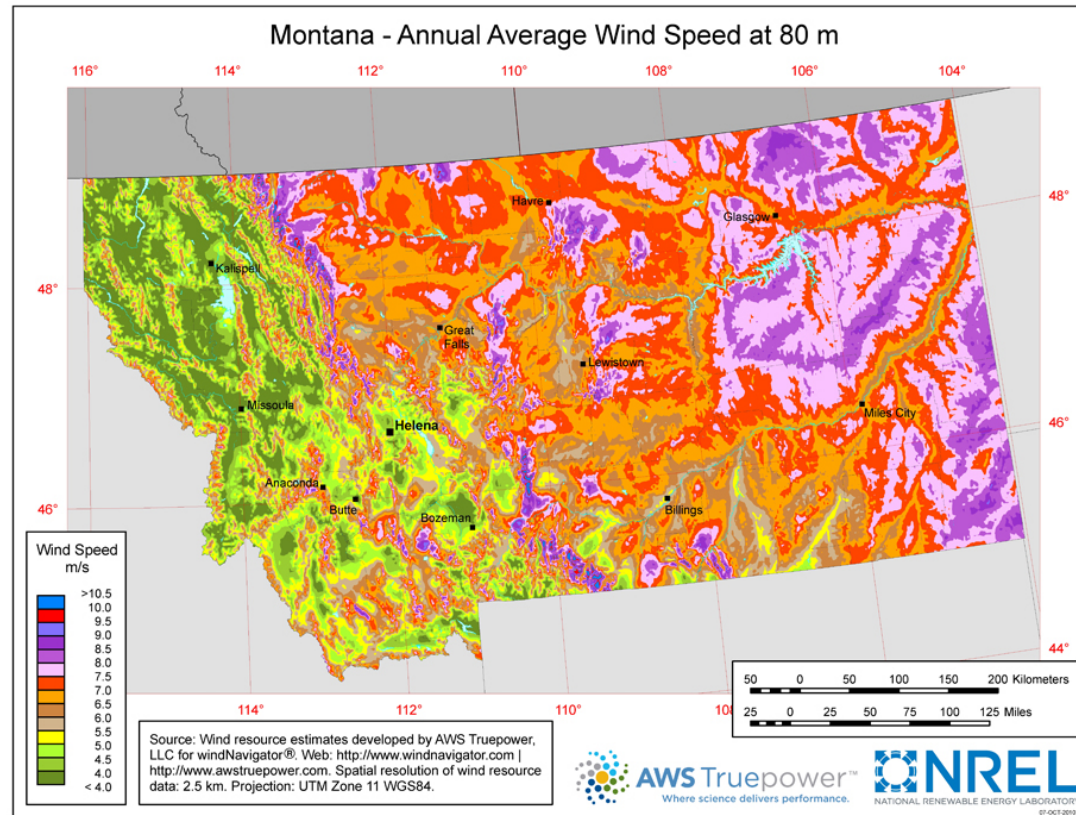
Judith Gap Wind Farm, Judith Gap, MT



Ravalli Electric Co-op Community Solar

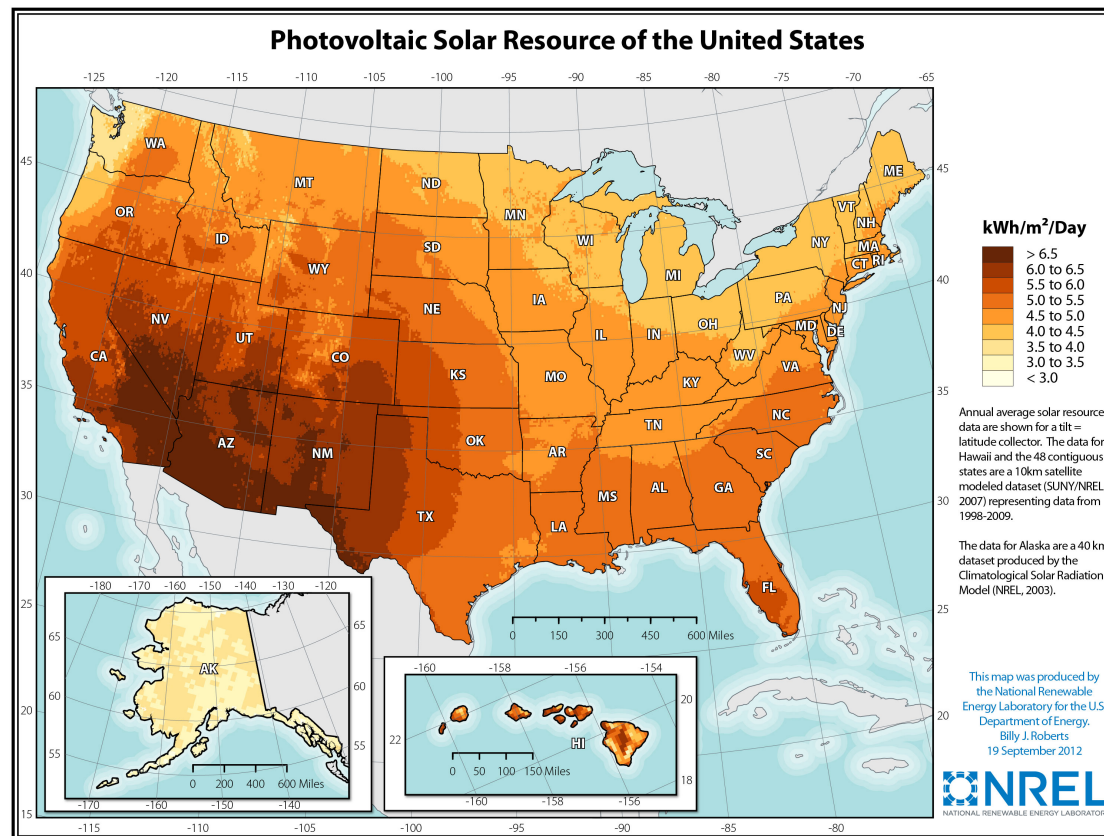


Montana Has #2 Wind Energy Potential in USA





Solar Energy



Montana Advantages

- Many sunny days (winter especially)
- Temperate climate



Montana Solar

Rooftop Solar



St. James Episcopal Church, Lewistown, MT

Utility Scale Solar

MENU

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Buy & Sell

Montana's largest solar farm proposed for Billings

By TOM LUTEY tlutey@billingsgazette.com Feb 12, 2017

LARRY MAYER, Gazette Staff

A solar power array is planned for the Alkali Creek area northwest of Billings.

[Buy Now](#)

MORE INFORMATION

Federal commission faults Montana for pulling the plug on solar rates

Montana's Public Service Commission was wrong to pull the plug on guaranteed rates for small solar projects earlier this year, the Federal Ene...

A 480-acre solar farm proposed for northwest edge of Billings is heating up as renewable energy politics sour at the Montana Legislature.

The MT Sun solar farm would produce 80 megawatts of electricity, enough energy to power 14,400 homes. At 480 acres, it would be Montana's largest solar project and the first on public land.

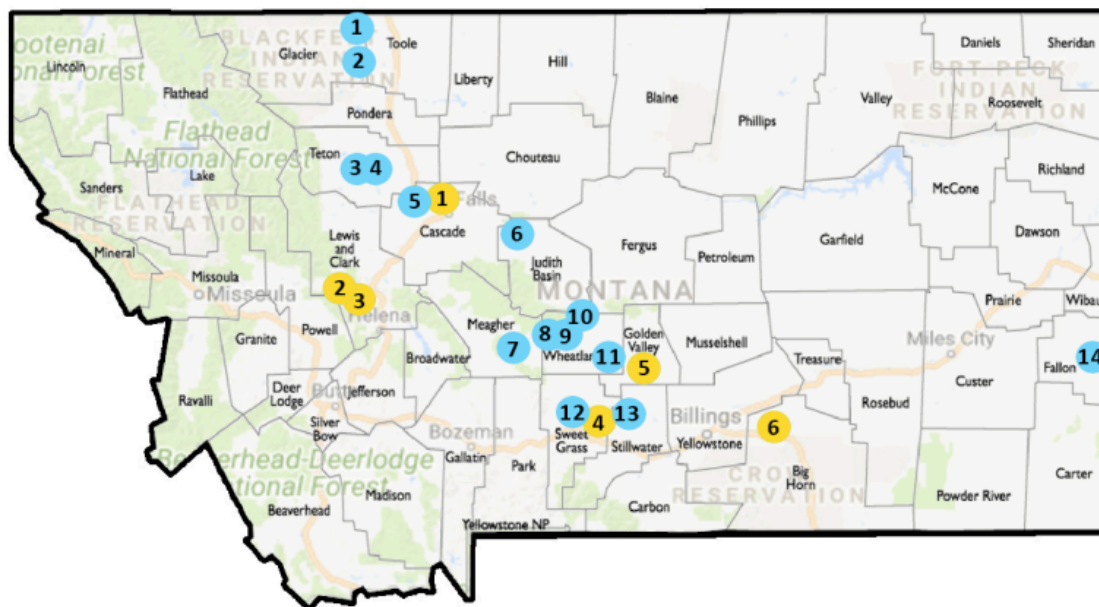
The state of Montana signed a lease with MT Sun last September and expects to begin the environmental work on the project in the coming months. Because the property involved is trust land,



MEIC

Operating Wind and Solar Projects in Montana

May 2018



	Project	Resource	MW	County	Year	\$ invested (millions)
1	Rim Rock Wind	Wind	189	Glacier, Toole	2012	300
2	Glacier Wind I & II	Wind	210	Glacier, Toole	2008-9	550
3	Fairfield	Wind	10	Teton	2014	25
4	Greenfield Wind	Wind	25	Teton	2016	34
5	Horseshoe Bend	Wind	9	Cascade	2006	15
6	Spion Kop Wind Farm	Wind	40	Judith Basin	2012	86
7	Gordon Butte Wind Farm	Wind	9.6	Meagher	2012	20
8	Martinsdale Colony	Wind	2.8	Wheatland	2007	5
9	Two Dot Wind	Wind	9.7	Wheatland	2014	21
10	Judith Gap	Wind	135	Wheatland	2005	203
11	Musselshell 1 & 2	Wind	20	Wheatland	2012	40
12	Big Timber	Wind	25	Sweet Grass	2017	31
13	Stillwater	Wind	80	Stillwater	2018	83
14	Diamond Willow I & II	Wind	30	Fallon	2008	45
1	Black Eagle	Solar	3	Cascade	2018	4
2	Great Divide	Solar	3	Lewis & Clark	2018	4
3	Green Meadow	Solar	3	Lewis & Clark	2017	4
4	Magpie	Solar	3	Golden Valley	2018	4
5	River Bend	Solar	2	Sweet Grass	2017	3
6	South Mills	Solar	3	Big Horn	2017	4



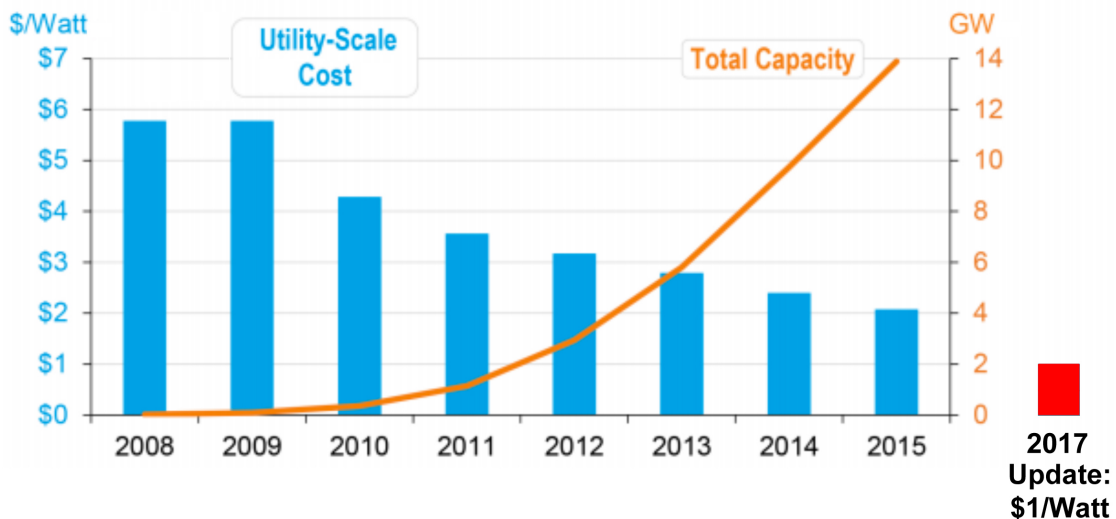
Is Clean Energy Low Cost?



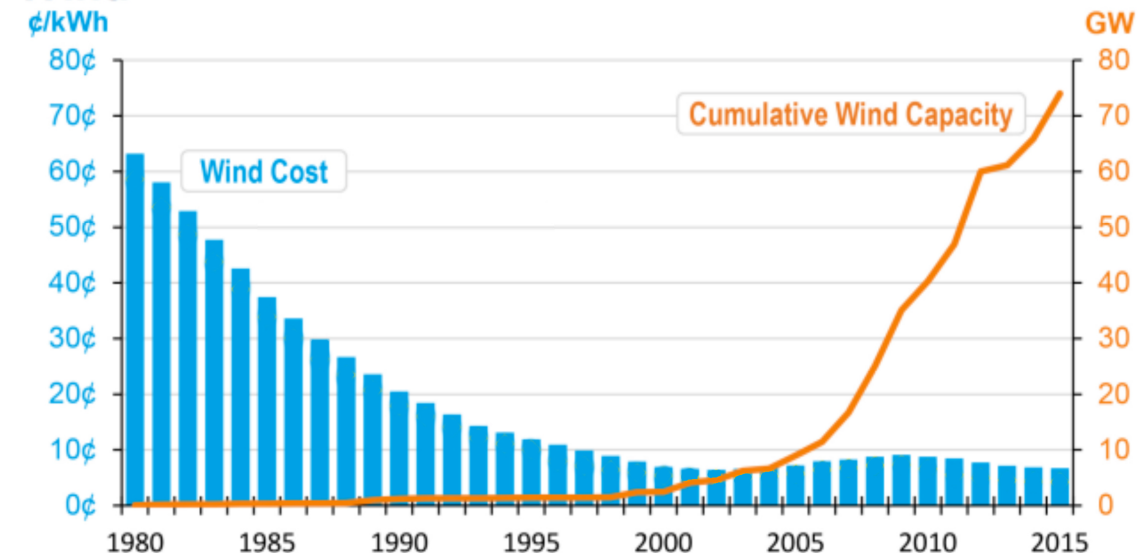
Clean Energy Has Become Low Cost

Technologies advanced → Installations increased → Costs declined further

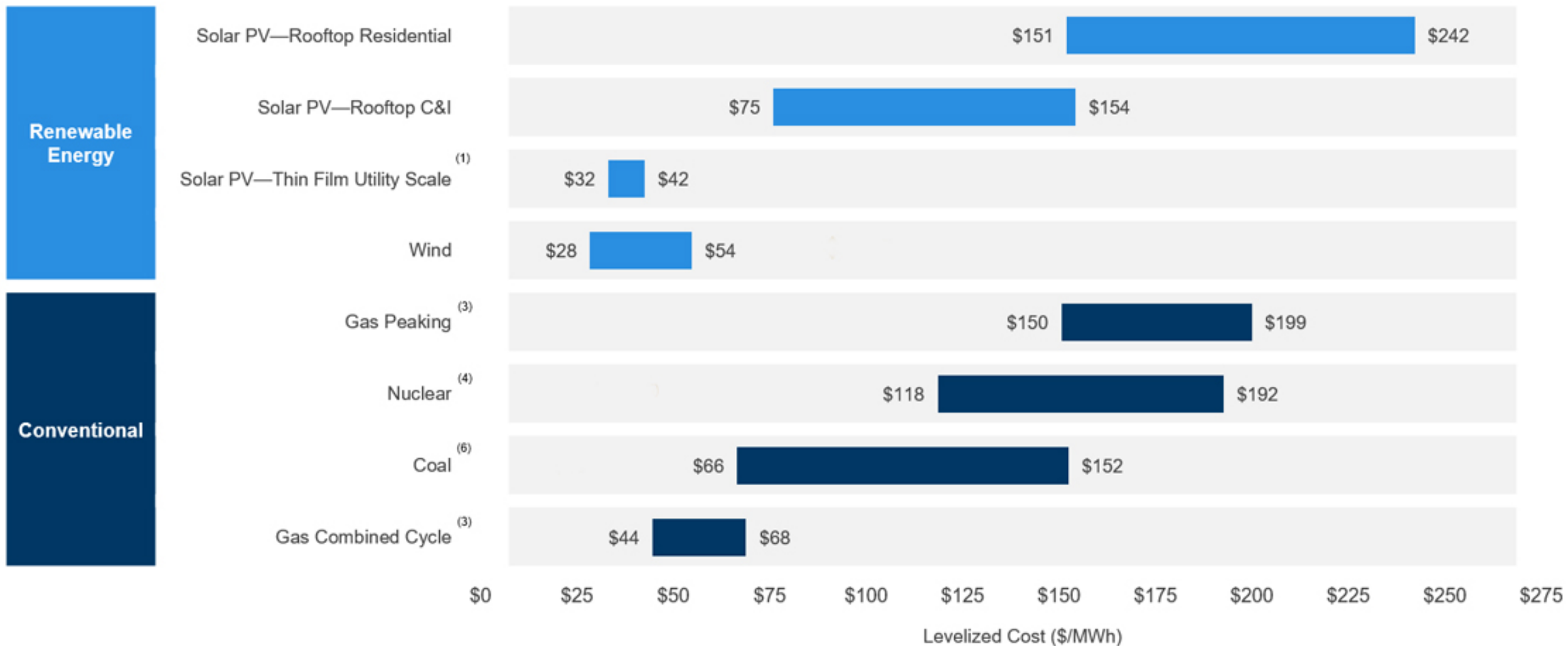
Solar



Wind



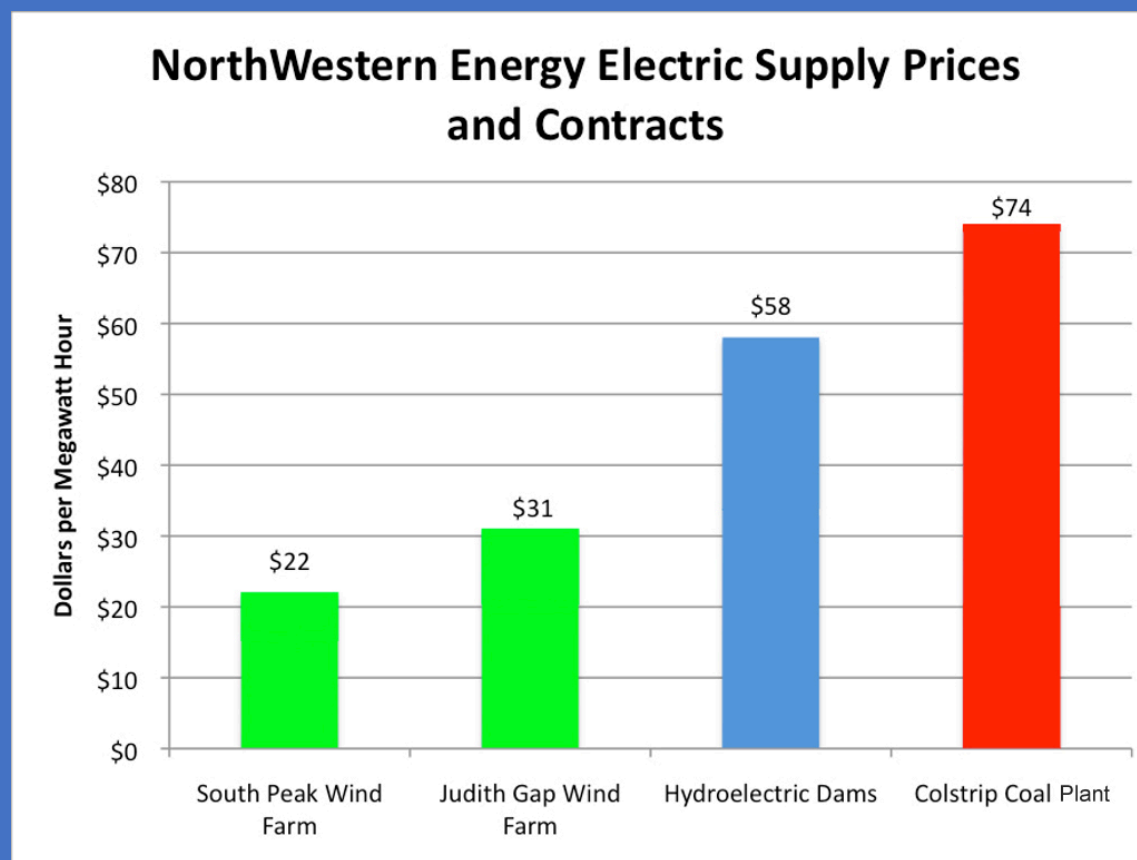
National Cost Averages



Source: Lazard Levelized Cost of Energy (2019)



Montana Wind Energy is VERY Low Cost



Source: Montana Consumer Counsel (2017)



But Aren't Renewables
“Intermittent”?



Energy Storage is Ready!

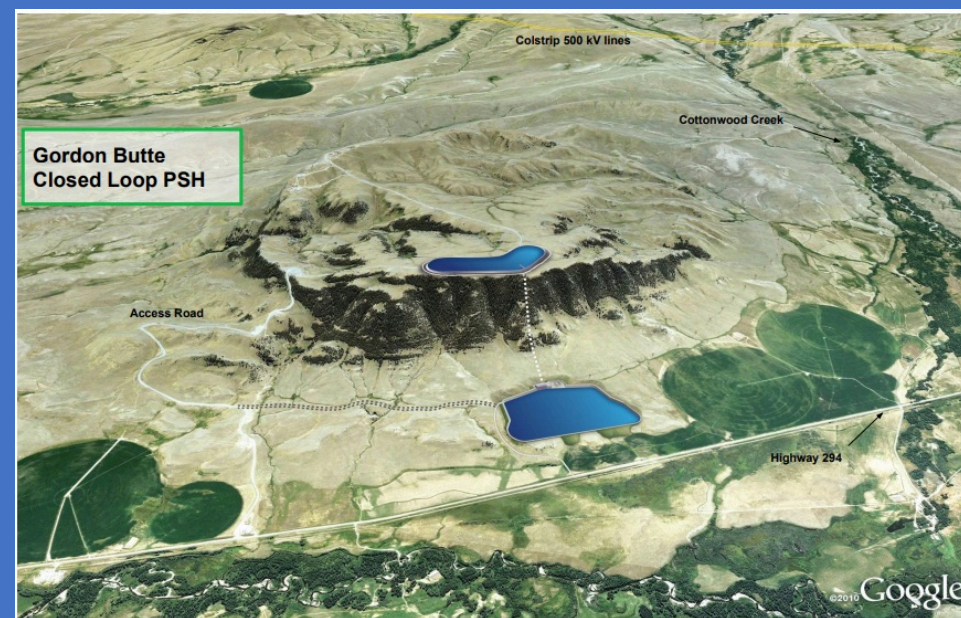
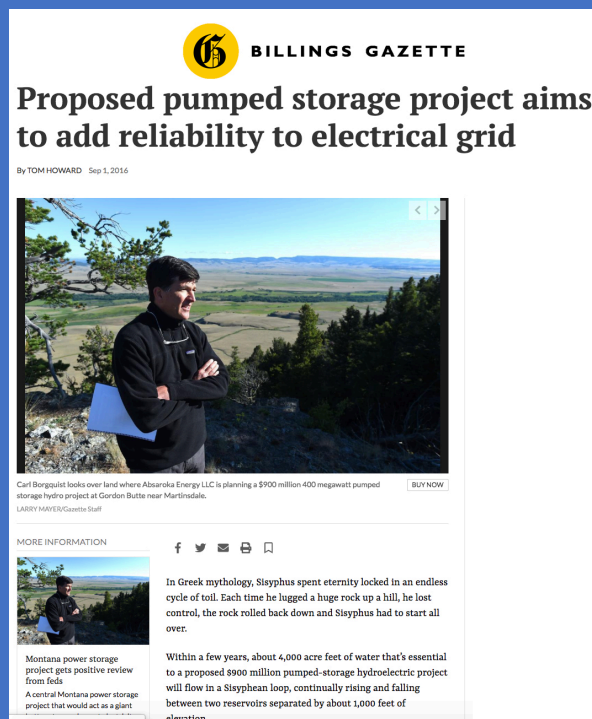


- Wind and solar become on-demand when paired with battery energy storage
- Not required at low to medium renewable %'s on the grid...
- But helpful, especially as more renewables come online



Montana Energy Storage

- Gordon Butte Pumped Hydro Energy Storage Project (proposed)
- Martinsdale, MT
- Giant battery





Energy Storage is Ready

- 250 MW wind
- 250 MW solar
- 200 MW battery (large!)

“It’s actually cheaper, economically, than a gas peaker plant of similar size...”

Phillip Schaeffer
Western Farmers electric co-op

gtm: Solar Grid Edge Storage Wind Trending Podcasts Downloads

SOLAR

‘Cheaper Than a Peaker’: NextEra Inks Massive Wind+Solar+Storage Deal in Oklahoma

NextEra will build a combined 700 megawatts for an electric cooperative group in a landmark deal for the hybrid renewables sector.

JULIAN SPECTOR | JULY 25, 2019



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The battery will serve as a peaker for the rural cooperatives, while wind and solar generate cheap energy.

NextEra Energy Resources seems intent on proving that triple hybrid plants can work in the U.S. market.

The powerhouse renewables developer contracted this week with Oklahoma-based Western Farmers Electric Cooperative to build the largest proposed solar-plus-wind-plus-storage plant in the U.S. The Skeleton Creek facility, slated for completion by the close of 2023, will include:

TOP ARTICLES MOST POPULAR MOST COMMENTS



Solar Net Metering Under Threat as Shadowy Group Demands Intervention in State Policies



But Can Renewable Energy
Power Our Economy?



Clean Energy Creates Major Economic Opportunities!



- Creates new careers
- Creates new tax revenue
 - \$66M to state and local govts in first 10 years
- Montana's current energy customers want clean energy



MAJOR Export Opportunities

Washington

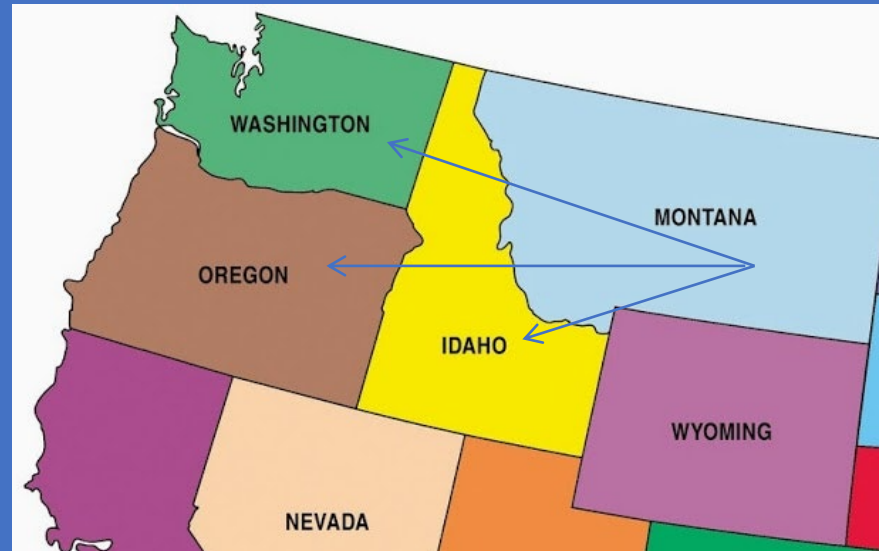
No coal by 2025

100% clean energy by 2045

Oregon

No coal by 2030

50% clean energy by 2040



Idaho

Idaho Power 100% clean energy by 2045

Governor Brad Little (R):
“Climate is changing, there’s no question about it. [...] And we’ve got to slow it down.”



Summary



- Montanans love clean energy
- Montana has abundant clean energy resources
- Clean energy is now low cost energy
- Clean energy = new careers, tax revenue for Montana



Questions & Answers

Using the “Chat” function, please type in your question

**For More Information or to join MEIC go to:
meic.org**

**Join us
Thursday, May 7, 4 pm
for
Montana Renewable Energy 202
“A Deeper Dive”**

