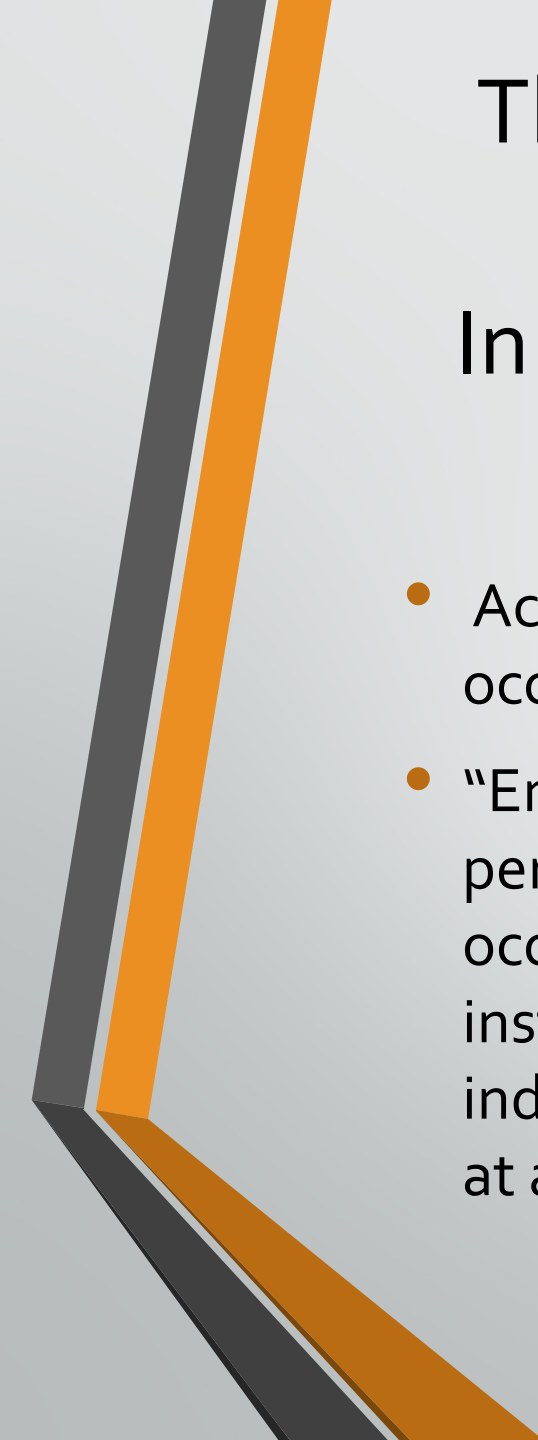




Facts about Net-Metering in Wyoming

And opportunities for job growth to help diversify our economy without harming others.

PS – It's all about solar these days!



The solar industry is one of the fastest growing economic sectors in the country.

In **JOBS – it IS the fastest growing occupation.**

- According to the U.S. Bureau of Labor Statistics, the fastest growing occupation through 2028 will be solar installer – at 63% growth.
- “Employment of solar photovoltaic (PV) installers is projected to grow 63 percent from 2018 to 2028, much faster than the average for all occupations. The continued expansion and adoption of solar panel installations will result in excellent job opportunities for qualified individuals, particularly those who complete photovoltaic training courses at a community college or technical school.”

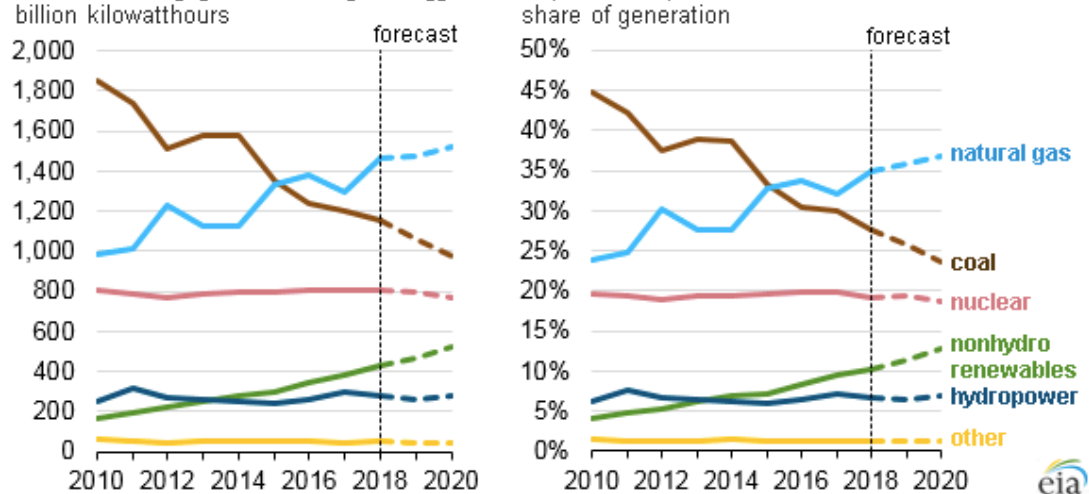
- Occupational Outlook Handbook, Fastest Growing Occupations, September 2019

...and very strong in overall **ECONOMIC GROWTH**

JANUARY 18, 2019

EIA forecasts renewables will be fastest growing source of electricity generation

U.S. electricity generation by energy source (2010-2020)

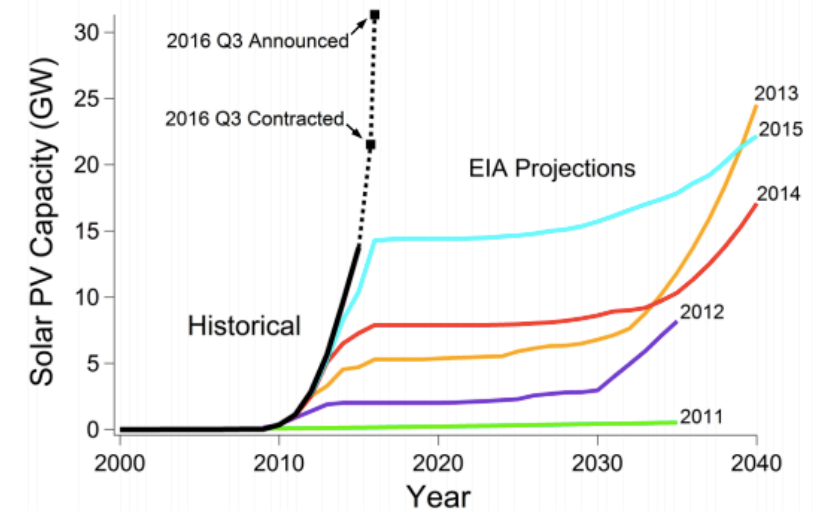


Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, January 2019

Note: Confidence interval derived from NYMEX options market information.

EIA expects non-hydroelectric renewable energy resources such as solar and wind will be the fastest growing source of U.S. electricity generation for at least the next two years. EIA's January 2019 *Short-Term Energy Outlook*

Figure 1. U.S. Utility-Scale Solar PV Capacity Projections in AEO 2011-2015 Reference



EIA projections of U.S. utility-scale solar PV capacity and historical capacity as well as points which include planned capacity under contract in Q3 of 2016 and planned but pre-contract installations as of Q3 2016. Projection data taken from the EIA's Annual Energy Outlook, historical data taken from the Solar Energy Industries Association's U.S. Solar Market Insight Reports.

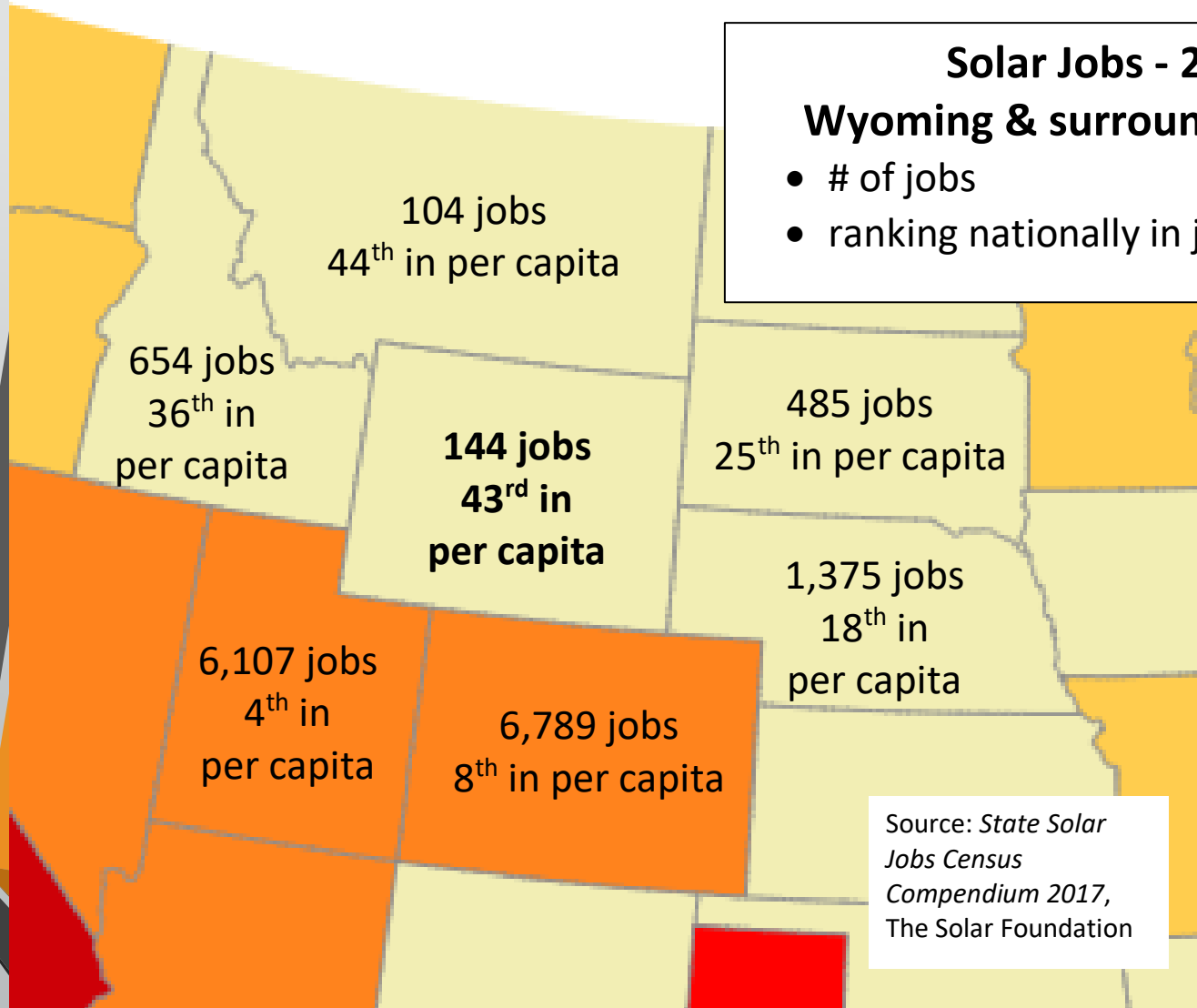
The US Energy Information Administration (EIA) projects strong growth in their 2019 Annual Energy Outlook, and historically, their projections have³ underestimated solar growth.

Where does Wyoming stand in jobs compared to our neighbors?

Solar Jobs - 2017

Wyoming & surrounding states

- # of jobs
- ranking nationally in jobs per capita



Source: *State Solar Jobs Census Compendium 2017*, The Solar Foundation

- Wyoming has the 8th best solar resource in the nation.
- We lag far beyond our neighbors, however, in solar jobs per capita.

What is the size of Wyoming's net-metering compared to other electricity on the grid?

For installed capacity (2017 figures)

- Net-metered systems = 4.18 megawatt **installed capacity**, compared to 8,588 MW total statewide
- **Thus, net-metered systems = .0487% or approximately 5/100ths of a percent of total WY capacity.**

If considering just generated energy (March 2019 figures)

- Net-metered systems account for 1.2 thousand megawatt hours, compared to 3,596 thousand MWh statewide
- **Thus, net-metering = .033 or approximately 3/100ths of a percent of total Wyoming energy generated.**

Source: U.S. Energy Information Administration
Wyoming State Energy Profile 2017 – 2019; 5
Wyoming Electricity Profile, 2017

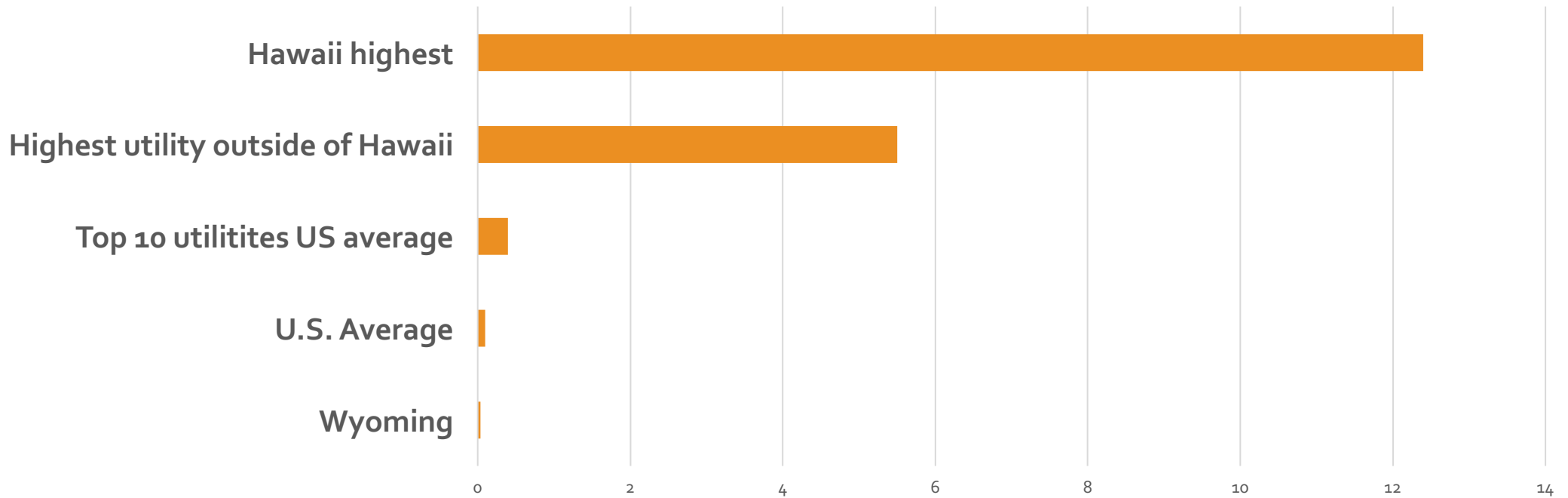
Other features of this small electrical sector...

- Total WY customers = **886**. 67% are solar, rest = wind & other.
- Of total installed generation, **83% = solar**, rest = wind & other.
- Of all of the above, **87% are residential users**.
- From 2010 - 2017, installed solar has grown 201% or 29% annually, while wind has declined 64% over the same time period
- In 2018 only 144,000 kilowatt hours were reported to the US EIA* as sold back to utilities from all net-metered systems, equaling a value of just \$4,320 at avoided cost prices.

** As reported on Form EIA-861 Annual Electric Power Industry Reports, 2018*

How does Wyoming's market penetration of net-metering compare to the rest of the U.S?

Net-metering market penetration comparisons (%)



	Wyoming	U.S. Average	Top 10 utilities US average	Highest utility outside of Hawaii	Hawaii highest
Series1	0.04	0.1	0.4	5.5	12.4

Does Wyoming's net-metered penetration... ...at 3/100th - 5/100th of a percent... pose a threat to other rate payers?

“..the US average penetration was just 0.4% across all electric utilities, and most utilities have yet to reach one-tenth of that. Thus, for the overwhelming majority of utilities, current PV penetration levels are far too low to result in any discernable effect on retail electricity prices...”

- U.S. Department of Energy, 2017, Lawrence Berkley National Laboratory, *Putting Potential Rate Impacts of Distributed Solar into Context*

“Implementing large or non-coincident peak demand charges for an entire residential or small commercial rate class to counter perceived cost shifting from a limited set of actors would most likely be a disproportional response if adoption [penetration] rates are low or under, say, 10 percent.”

- *Distributed Energy Resources Compensation Manual* published, National Association of Regulatory Utility Commissioners, Staff Subcommittee on Rate Design, 2016

“For **most** utilities, cost-shift from distributed solar is, and will continue to be, in the noise, simply by virtue of low penetration levels. If policy objective is keeping rates low, other issues generally offer much bigger bang for the buck.”

- National Council of State Legislatures
“Soaking Up the Sun” Webinar, September 28, 2017 “

Dozens of states have conducted “value of solar” studies to identify benefits and drawbacks of distributed solar.

“Most studies have shown that the benefits of distributed solar generation equal or exceed costs to the utility or other customers where penetration is low. Assertions that current or future solar customers have shifted or will shift costs to others, and/or create new costs, must be demonstrated with valid, transparent data that reflects the values, avoided utility costs, and results of deploying solar at the distribution level, as well as the utility cost of providing service.”

“Penetration level should be the leading threshold criteria for consideration of alternatives to NEM [net energy metering].”

“A number of studies also identify modeled impacts associated with significant penetration of solar on the utility system. Most studies characterize low penetration as less than 5% of peak demand or total energy met by solar generation, and characterize high penetration as 10%-15% or more.”

- *A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation*, Interstate Renewable Energy Council, Inc. 2013

“In general, the majority of the studies conclude that the total value of the benefits solar DG provides exceed the retail cost of electricity to ratepayers, and that the value of solar is greater than the compensation to solar DG customers under NEM policies. In other words, customers deploying solar DG and participating in NEM programs are actually cross-subsidizing nonparticipating customers.”

- Institute for Energy Innovation, *Solar Energy in Michigan: The Economic Impact of Distributed Generation on Non-Solar Customers*, June 2017.

In Conclusion...

- The solar energy sector and job growth hold great potential for Wyoming to diversify its economy.
- Wyoming has great solar resources, but we are lagging behind our neighbor states in regards to job growth in this industry.
- Net metering in Wyoming represents only about 4/100ths of a percent of the electricity market.
- Experts and regulators agree that market penetration is key in determining if there are impacts to other rate-payers, and identify thresholds as ranging from 5 - 10%.
- The majority of state studies regarding the value of solar reflect that cost shifts can go both ways, and distributed solar can benefit other rate-payers.
- Wyoming can safely grow jobs in this sector. We are simply too small at .04% penetration, with less than 900 customers statewide to matter to overall rates. We need policies that will help our small businesses grow, not ones that put them out of business.