



Founded in 2004, REAP is a statewide non-profit coalition of over 75 businesses, electric utilities, Alaska Native Corporations, NGOs and clean energy developers. REAP's 21-member board of directors is elected from its members.

REAP's mission is to increase renewable energy development and promote energy efficiency in Alaska.

REAP Education & Programs



STEM educators promoting AK *EnergySmart* and *Wind for Schools* reach 700 classrooms annually

Alaska Network for Energy Education and Employment (ANEEE) to develop clean energy careers

Sustainable Southeast Partnership (SSP)

Alaska Wind Working Group

Islanded Grid Resource Center

Conferences, Workshops, Renewable Energy Fairs, Public Presentations

Over 30 years of Railbelt Reform Efforts

1986	Railbelt Energy Fund established
1998	Joint Committee on electric utility restructuring established
2003	Alaska Energy Policy Task Force established
2005	Alaska Railbelt Energy Authority Joint Action Agency established
2008	Railbelt Electrical Grid Authority (REGA) proposed
2010	Greater Railbelt Energy & Transmission Company (GRETC) proposed
2011	Railbelt Integrated Resource Plan (RIRP) completed
2014	Legislature makes appropriation for the RCA to study the Railbelt system

REAP Involvement in Recent Reform Efforts

2011	Member of Railbelt Integrated Resource Plan (RIRP) Citizen Advisory Committee	2017	Public comment at the RCA on I-15-001 REAP urges the Alaska Railbelt Cooperative Transmission and Electric Company (ARCTEC) to hire a mediator. Instead ARCTEC hires a consultant (GDS) that recommends formation of the Railbelt Reliability Council (RRC)
2014	Utilities approach REAP to support formation of an Independent System Operator (ISO)		
2015	REAP urges legislature to introduce HB 187 to create an ISO Public comment at the RCA on I-15-001	2018	REAP urges legislature to introduce HB 382 to form an ISO Public comment at the RCA on I-15-001 REAP begins to comment on language of MOU to form the RRC
2016	Public comment at the RCA on I-15-001		
2017	Member of Anchorage Economic Development Corporation (AEDC) working group that urges the merger between ML&P and Chugach	2019	Multiple meetings with utilities and other stakeholders to negotiate language of MOU to form the RRC Public comment at the RCA on I-15-001

REAP Supports the Legislation as Proposed and its Four Pillars:

- 1) To allow the RCA to oversee the new RRC if it is successfully established voluntarily.
- 2) To allow the RCA to establish something like the RRC on its own, if current voluntary efforts to do so fail.
- 3) To call on the RRC to execute regional integrated resource planning that would allow a broad public process to decide the future generation and transmission needs for the Railbelt
- 4) To give the RCA the authority to pre-approve all large new generation and transmission projects to protect Railbelt consumers.

The Problem: The region's six utilities equal about one-half of a typical power plant in the Lower 48

*No regional **economic dispatch** – instead of one single **load balancing area** for the region, we have six suboptimal ones*

*No **regional planning***

*No **pre-approval authority** by the RCA*

*No regional **reliability standards***

*No regional **non-discriminatory interconnection standards***

*No regional **transmission tariff***

Inter-utility litigation

Electric Grid Reform is Risk Management

Establishing an Electric Reliability Organization (ERO) will prepare the Railbelt for challenges that are already here:

- 1) *Fuel Price Volatility*
- 2) *Climate Risk*
- 3) *Technology Innovation*
- 4) *Customer Needs and Desires*
- 5) *Grid Resiliency and Security*

Fuel Price Volatility in Cook Inlet

Virtual monopoly control of natural gas

Flat demand in the Railbelt

High production costs & aging infrastructure

Unsustainable state production subsidies

Climate Risk: A Federal Carbon Price is Likely Inevitable

*“Pricing carbon obviously adds a cost to our production and our products – but carbon pricing policy frameworks will contribute to provide our businesses and their many stakeholders with a **clear roadmap for future investment**, a level playing field for all energy sources across geographies and a clear role in securing a more sustainable future.”*

Letter to the United Nations June 1, 2015

from BP, Royal Dutch Shell, Total, Eni, Statoil and BG Group

Technology Innovation (And Other Disruptors)

Rapidly falling wind and solar prices

Electric transportation

Electric heating (air source heat pumps)

Energy Storage

Energy Efficiency

Distributed Energy Resources (DERs)

Advanced Metering

Performance Based Regulation

Utility Solar and Wind are Stably Priced, & Cost Competitive Today

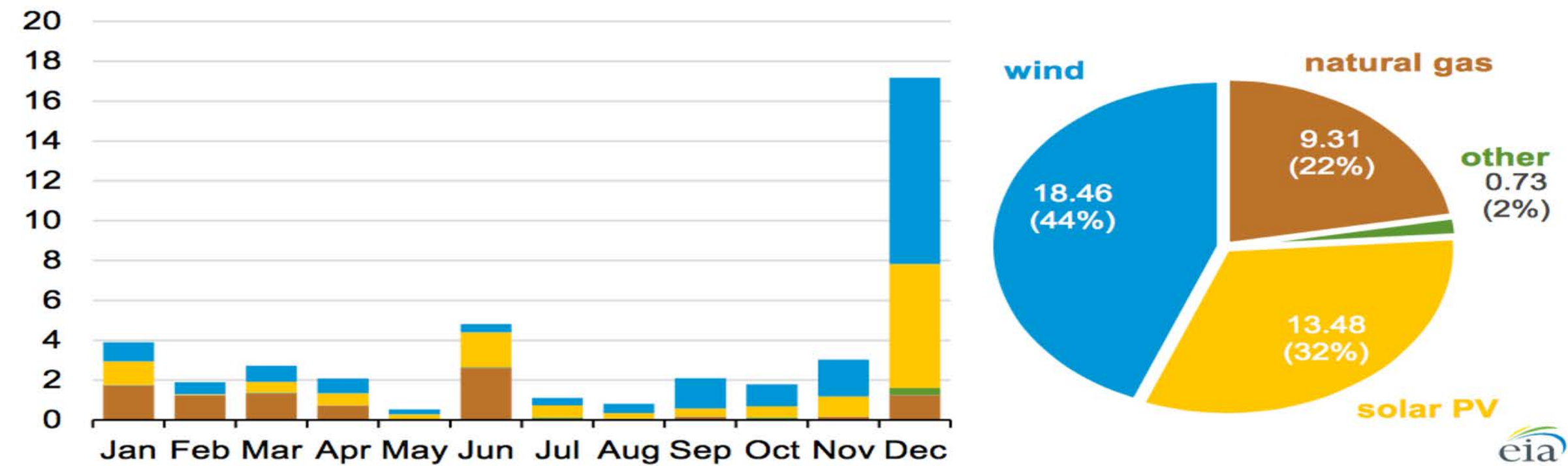


Over the last decade, wind energy prices have fallen 70% and solar photovoltaics have fallen 89%, on average.

Levelized Cost of Energy Analysis Lazard (December 2019)

New electric generating capacity in 2020 will come primarily from wind and solar

Planned U.S. electric generating capacity additions (2020)
gigawatts (GW)

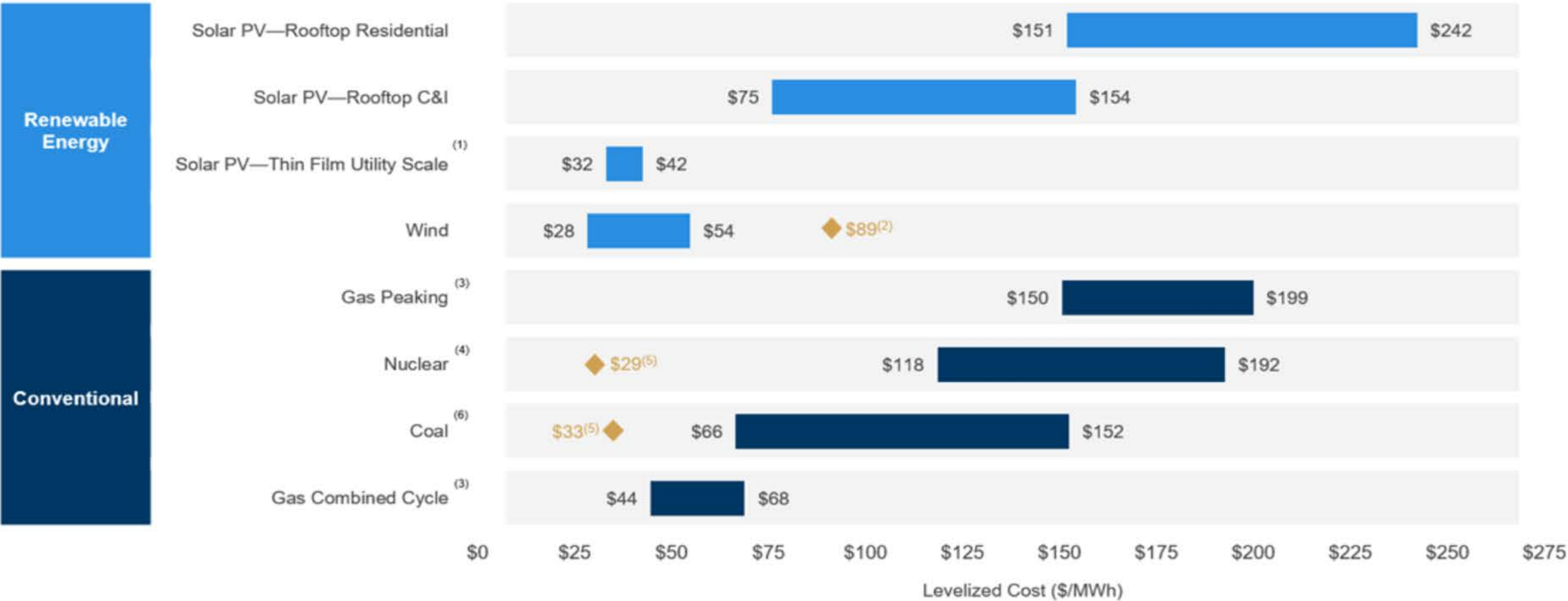


Source: U.S. Energy Information Administration, [Preliminary Monthly Electric Generator Inventory](#)

According to the U.S. Energy Information Administration's (EIA) latest [inventory of electric generators](#), EIA expects 42 gigawatts (GW) of new capacity additions to start commercial operation in 2020. Solar and wind represent almost 32 GW, or 76%, of these additions. Wind accounts for the largest share of these additions at 44%, followed by solar and natural gas at 32% and 22%, respectively. The remaining 2% comes from hydroelectric generators and battery storage.

Levelized Cost of Energy Comparison—Unsubsidized Analysis

Selected renewable energy generation technologies are cost-competitive with conventional generation technologies under certain circumstances



Source: Lazard estimates.

Note: Here and throughout this presentation, unless otherwise indicated, the analysis assumes 60% debt at 8% interest rate and 40% equity at 12% cost. Please see page titled "Levelized Cost of Energy Comparison—Sensitivity to Cost of Capital" for cost of capital sensitivities. These results are not intended to represent any particular geography. Please see page titled "Solar PV versus Gas Peaking and Wind versus CCGT—Global Markets" for regional sensitivities to selected technologies.

(1) Unless otherwise indicated herein, the low end represents a single-axis tracking system and the high end represents a fixed-tilt system.

(2) Represents the estimated implied midpoint of the LCOE of offshore wind, assuming a capital cost range of approximately \$2.33 – \$3.53 per watt.

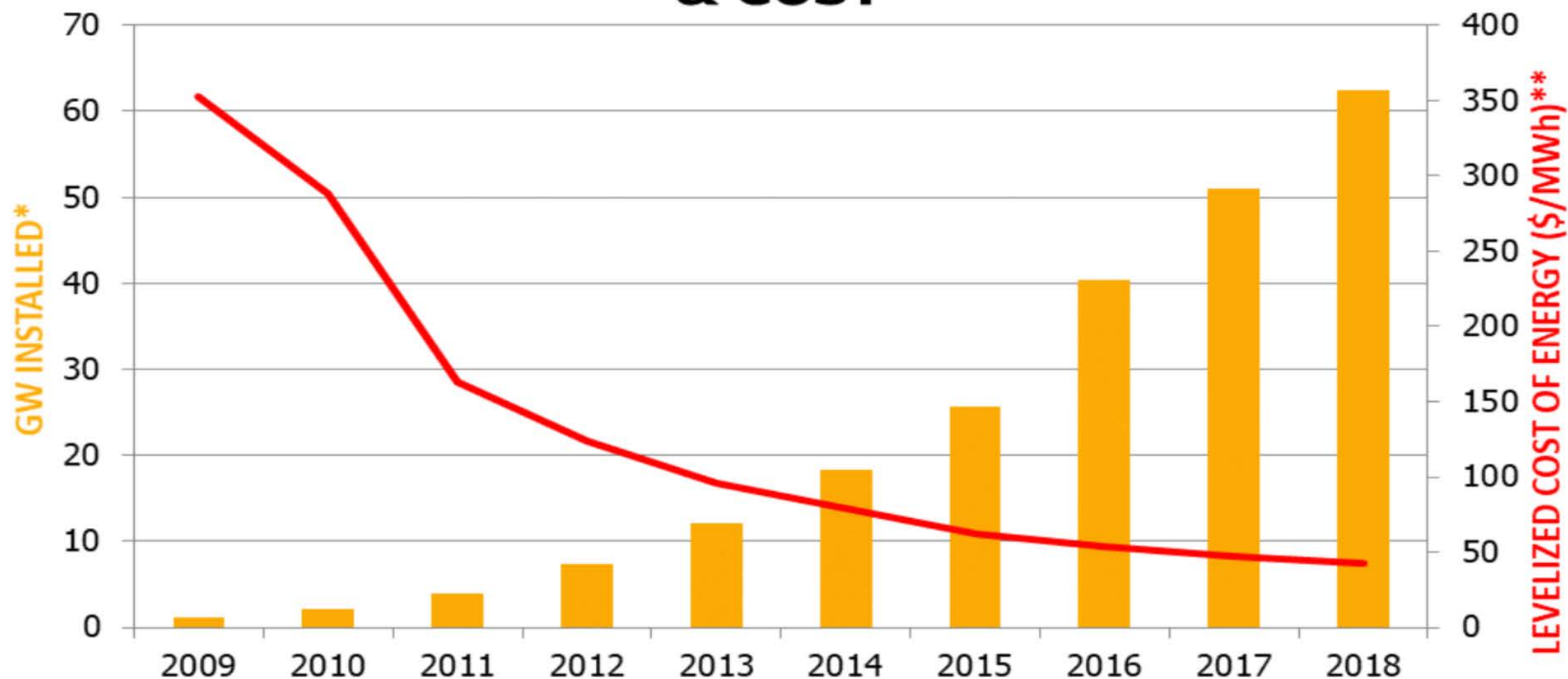
(3) The fuel cost assumption for Lazard's global, unsubsidized analysis for gas-fired generation resources is \$3.45/MMBTU.

(4) Unless otherwise indicated, the analysis herein does not reflect decommissioning costs, ongoing maintenance-related capital expenditures or the potential economic impacts of federal loan guarantees or other subsidies.

(5) Represents the midpoint of the marginal cost of operating coal and nuclear facilities, inclusive of decommissioning costs for nuclear facilities. Analysis assumes that the salvage value for a decommissioned coal plant is equivalent to its decommissioning and site restoration costs. Inputs are derived from a benchmark of operating coal and nuclear assets across the U.S. Capacity factors, fuel and variable and fixed operating expenses are based on upper and lower quartile estimates derived from Lazard's research. Please see page titled "Levelized Cost of Energy Comparison—Renewable Energy versus Marginal Cost of Selected Existing Conventional Generation" for additional details.

(6) High end incorporates 90% carbon capture and compression. Does not include cost of transportation and storage.

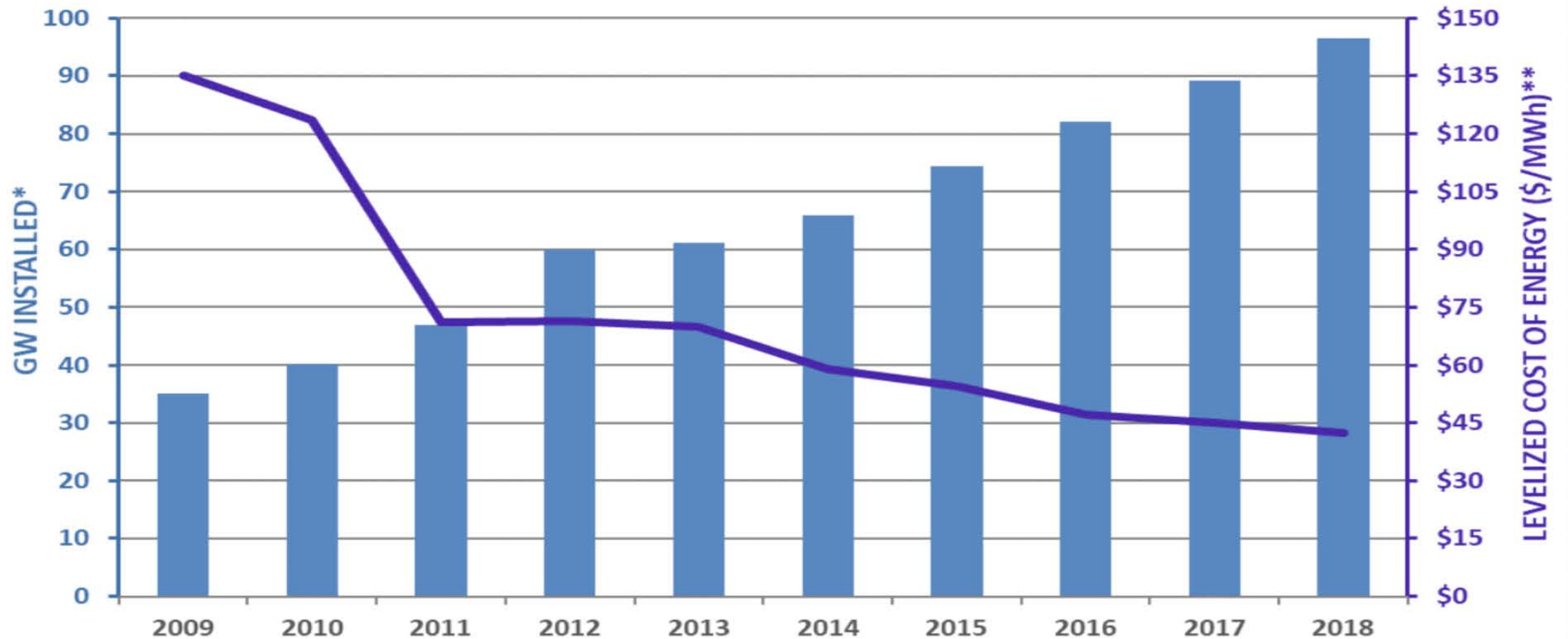
U.S. UTILITY-SCALE SOLAR PV DEPLOYMENT & COST



* Utility-scale capacity data - LBNL Utility-Scale Solar data set (2009-2016); SEIA/Wood MacKenzie Power & Renewables U.S. Solar Market Insight Report (2017-2018)

**LCOE - Lazard's Levelized Cost of Energy Analysis (2009-2019), technology-weighted avg. of high/low ranges

U.S. ONSHORE WIND DEPLOYMENT & COST

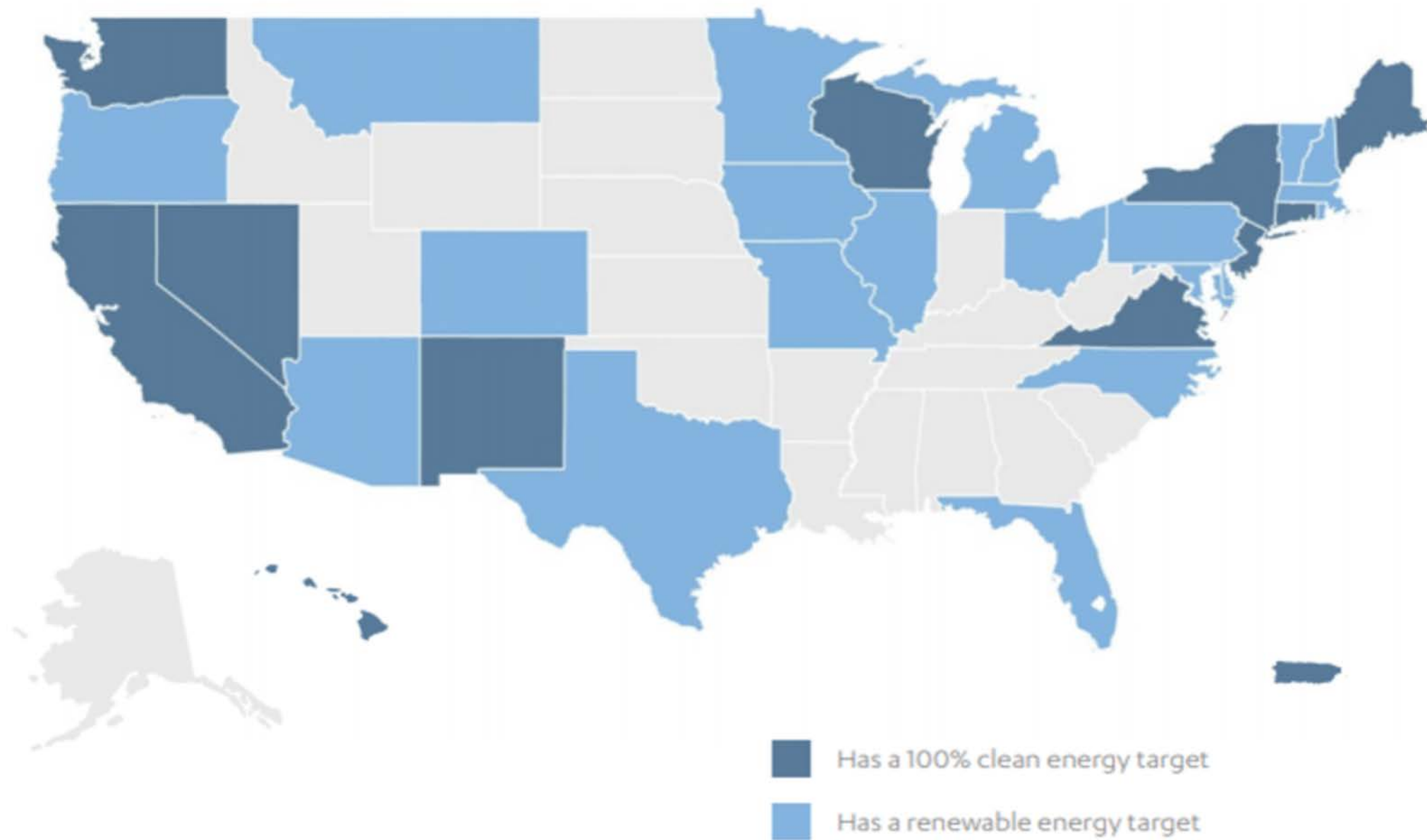


*Annual & Cumulative Capacity - LBNL Wind Technologies Market Report (2017) & AWEA market reports (2018 Annual Report)

**LCOE - Lazard's Levelized Cost of Energy Analysis (2009-2019), avg. of high/low figures



STATES THAT HAVE PASSED 100% CLEAN ENERGY POLICIES OR OTHER RENEWABLE ENERGY TARGETS



Customer Needs and Desires

Almost Half of *Fortune 500s* Have Set Climate Change or Clean Energy Targets

The Fortune 100, the largest companies in the index, continue to be the leaders: 63% of them have set one or more clean energy targets.

Power Forward 3.0 (April 2017)

Apple's Next US Data Center to be Built in Iowa and Run on 100% Renewable Energy



Apple's investment of \$1.3 billion will create 550 construction jobs in the Des Moines area, and the company is contributing up to \$100 million to a newly created Public Improvement Fund

Grid Resiliency and Security

Western grid integration could be a boon for wind

Benjamin Storrow, E&E News reporter • Published: Monday, July 31, 2017



The Southwest Power Pool is in talks to expand its membership to include utilities from the Mountain West, paving the way for more wind to be brought online. CGP Grey/Flickr

“When utilities pool their generation assets and dispatch them together, you get greater efficiency and flexibility. Those two things combine to help renewable integration.”

Stephen Beuning, Director of Market Operations, Xcel Energy

Climate Wire, July 31, 2017

Governance Concerns

The governing board outlined in the RRC MOU is not independent

REAP and other non-utility stakeholders had little leverage to change the governance structure that the utilities wanted in their MOU

AEA would be a “utility” if it were not a state entity

Would like to see a requirement that minority positions of the RRC in the IRP process are reported to the RCA

Would like to see a commitment to transition to a truly independent governing board over the next 5-10 years.

Other Thoughts

Don't want "local planning" and reliability criteria to create loopholes in the Integrated Resource Planning (IRP) process or the RCA's pre-approval authority.

Want to make certain the legislation has everything necessary to allow for the rapid establishment of a universal transmission tariff.

Would like to see a commitment to transition to merit-order economic dispatch at a future time certain.

Want to make certain that the RRC develops protocols to allow for non-discriminatory open access to both individual utility networks *and* the wider transmission system

Believes the legislation should reflect the needs of Alaskans, not the needs of the utilities'
Memorandum of Understanding to form the RRC

What Railbelt Reform Would Do For Alaska

- *Create* a more of a level playing field for renewable energy producers
- *Stabilize* energy prices, including rural electricity, and diversify our fuel mix
- *Decrease* GHG emissions
- *Attract* investment
- *Diversify* our economy and create jobs
- *Prepare* us better for a future that will likely include both electric transportation and heating

