

REINHOLD ENVIRONMENTAL Ltd.



2019 NO_x-Combustion-CCR Round Table Presentation

February 11 & 12, 2019, in Salt Lake City, Utah / Hosted by PacifiCorp

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Environmental Challenges

And the Future of Fossil-Fueled Power



James Owen, Environmental Director, PacifiCorp

BERKSHIRE HATHAWAY INC.



- 11.8 million customers & end users
- 18 states (energy)
- 48 states (real estate)
- 23,000 employees
- 237,100 powerline miles
- 42,200 pipeline miles



William J. Fehrman
President and CEO



-  **PACIFIC POWER**
-  **ROCKY MOUNTAIN POWER**
-  **MidAmerican ENERGY.**
-  **NVEnergy**
-  **NORTHERN POWERGRID**
-  **BHE PIPELINE GROUP**
-  **ALTALINK**
-  **BHE U.S. TRANSMISSION**
-  **BHE RENEWABLES**
-  **HOMESERVICES OF AMERICA**
A Berkshire Hathaway Affiliate
-  **BERKSHIRE HATHAWAY HOMESERVICES**

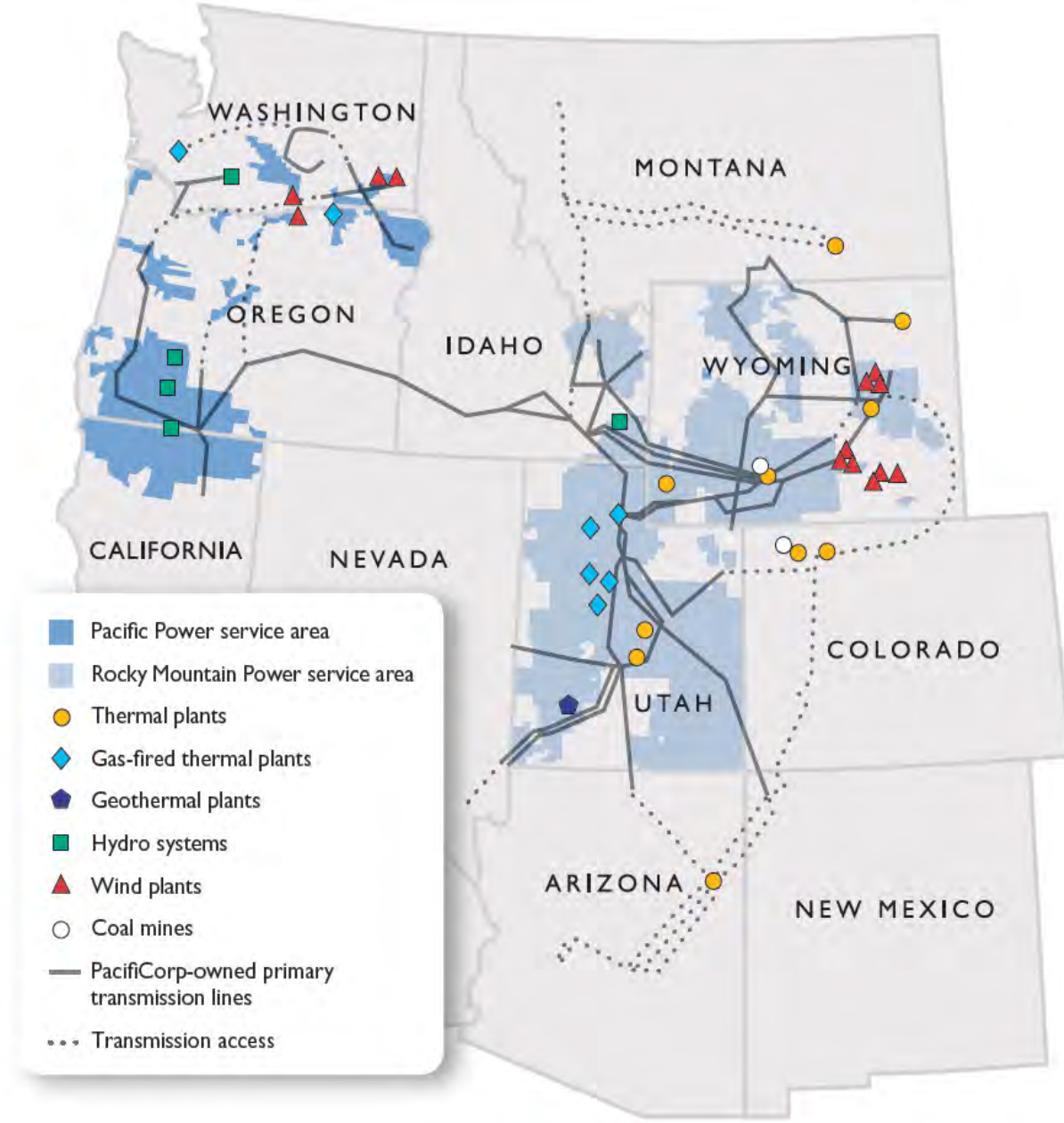
- 1.9 million customers
- 141,000 square mile service area
- 10,887 MW net-owned capacity
- 2,198 MW owned renewable / non-carbon
- 73 generating facilities
- 64,000 miles of distribution lines
- 16,500 miles of transmission lines
- 5,500 employees
- Headquartered in Portland, Oregon



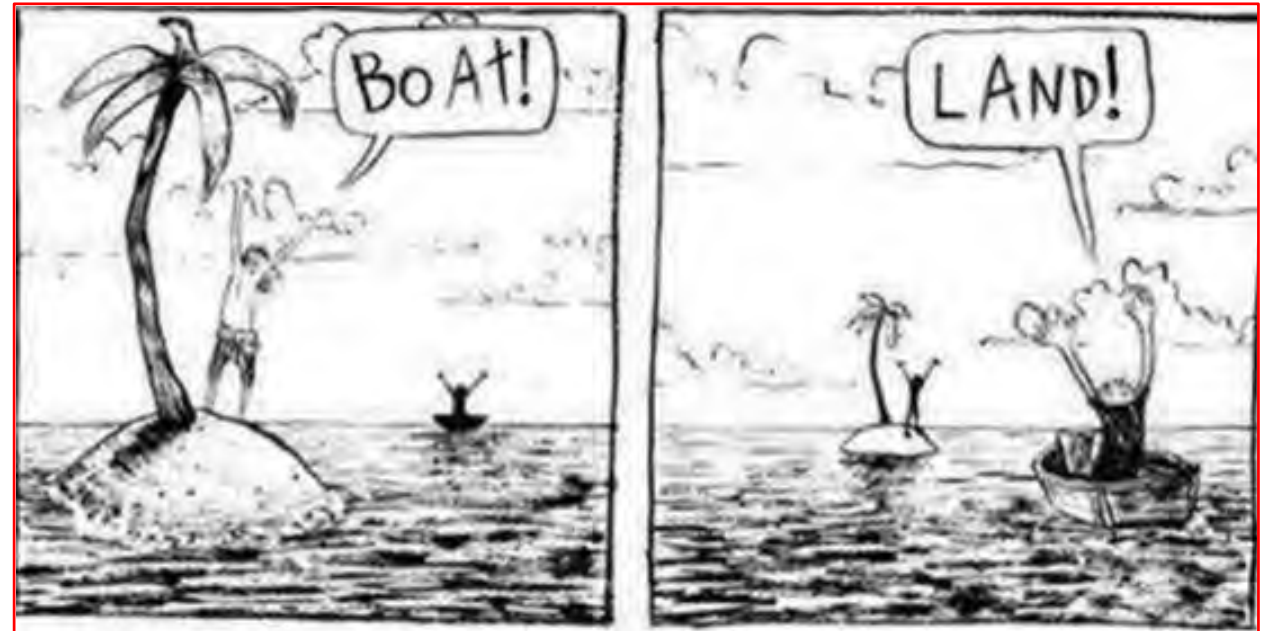
STEFAN A. BIRD
President and CEO
Pacific Power



GARY W. HOOGVEEN
President and CEO
Rocky Mountain Power



- Challenges = Opportunities
- *“It’s tough to make predictions, especially about the future”*
-Yogi Berra
- Rookie perspective
- Viewpoint perspective



spiritualartwork.wordpress.com

Changing Aspects Environmental Landscape	Key Challenge / Opportunity
1 - Environmental Regulation	Regulatory Uncertainty
2 - Climate Goals	Balancing Reliability with Sustainability
3 - Innovative Legal Tactics by Environmental Organizations	Public Perception / Litigation Costs
4 - Increasing Renewable Generation	Managing/Embracing Successful Transition
5 - Changing Customer Demands	Adaptation to New Generation



Naughton Plant, Kemmerer Wyoming

- April 2015 CCR Rule Published under RCRA subtitle D
- July 2015 Challenged by NGO's and Industry

→ Environmental Petitioners :

“EPA did not go far enough to protect the public and the environment...”

→ Industry Petitioners :

“EPA exceeded its statutory authority under RCRA...”

- Dec. 2016 Congress passes Water Infrastructure Improvements for the Nation (WIIN) Act
- Oct. 2017 EPA announces reconsideration of CCR Rule – moves to hold case in abeyance
- Nov. 2017 Oral Arguments in D.C. Circuit
- Mar. 2018 EPA Administrator signs the first of two phased amendments to the 2015 rule → notice & comment
- June 2018 EPA approves Oklahoma's CCR permit program
- July 2018 EPA promulgates Phase I Part I rulemaking; Pruitt resigns
- Aug. 2018 D.C. Circuit Court Issues Decision

- **Sep. 2018** Environmental Petitioners challenge approval of Oklahoma Rule
- **Oct. 2018** Environmental Petitioners challenge Phase I Part I
- **Nov 2018** Elections result in Democratic-controlled House; Republican-controlled Senate
- **Jan. 2019** EPA / Industry respond to Petitioners Phase I Part I challenge

What's Coming Next?

- Phase II Rulemaking (2019)
- Phase I Part II Rulemaking (2019)
- WIIN Act Implementation → Federal permit program rulemaking (2019)
- Response to Challenge to Oklahoma Rule (2019)
- Some states applying (2019), other states waiting (2020-21)
- Rulemaking in Response to D.C. Circuit Decision (2019)
- Administration change (2020 or 2024) ???



Huntington Plant, Huntington, Utah

Aug 2015 - Obama Administration announces CPP

BSER- Building Blocks

- Improved efficiency (6% heat-rate improvement)
- Shifting generation from coal to natural gas
- Shifting generation to renewables
- o Demand-side energy efficiency

Aimed to achieve 30% + reduction in (2005)
CO₂ emissions by 2030

Aug 2018 - Trump Administration announces ACE

Candidate Technologies

- Neural Network/Intelligent Sootblowers
- Boiler Feed Pumps
- Air Heater & Duct Leakage Control
- Variable Frequency Drives
- Blade Path Upgrade (Steam Turbine)
- Redesign/Replace Economizer
- Improved O&M Practices

States to submit SIP that establishes “standards of performance” within 3 years of final rule

Regional Haze Rule

- Visibility Impacts at 118- Class I Areas
- State SIPS for the 2nd Planning Period Due July 2021
- 4-Factor Analysis for Control Measures

Mercury and Air Toxic Standards (MATS) Rule

- Feb. 2019 – proposed rule revision published in Federal Register
- Attempt to address ‘failure to consider compliance costs’
- Revokes determination that regulation was ‘appropriate and necessary’ under the CAA

What's Coming Next?

Environmental Regulation

- Administration change (2020 or 2024) ??
- CCR, MATS, ACE, etc. rules all tighten
- ACE – wide variety of SIPs, nothing to base approval on → arbitrary & capricious challenges
- Litigation, litigation, litigation \$\$\$
- Feb 8, 2019 EPA published proposal of 'new enforcement initiatives'
<https://federalregister.gov/d/2019-01548>
- **Key Challenge/ Opportunity: Regulatory Uncertainty**

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TRENDING: DONALD TRUMP | NBA | RALPH NORTHAM | RUSSIA | SENATE | EUROPEAN UNION | NEW YORK | IRAN | JUSTIN FAIRFAX | NBA

Bank of the West's climate change mission fuels coal country backlash

DENVER — If Al Gore started a savings-and-loan, it might look something like the climate-conscious Bank of the West, and that's become a source of friction in the coal-mining counties of Colorado and Wyoming.

State and local officials are seeking to close their accounts with the San Francisco-based bank over its recently publicized [decision](#) to withdraw from the fossil-fuel industry, part of the company's mission to "address climate change" and "transform culture through corporate social responsibility."

The revelation shook Moffat County, Colorado, where the Bank of the West branch in Craig has long been a part of the rural community steeped in oil, coal and natural gas.

First [Stacy Razzano](#), the branch manager and self-described "coal miner's daughter," tendered her resignation after 27 years. Then the Moffat County Commission asked the county treasurer to make recommendations on where to transfer its Bank of the West accounts.

"We're not going to support organizations that don't support us," said Moffat County Commissioner Ray Beck.

He said he and his wife had banked with the Craig branch for 40 years, but last week they closed their two joint



• Washington Governor Inslee’s 100% Clean Bill (SB 5116 / HB 1211)

Brief Summary of Bill

- Requires all electric utilities to eliminate from electric rates all costs associated with delivering electricity generated from coal-fired power plants by December 31, 2025.
- Requires each electric utility to make all retail sales of electricity greenhouse gas neutral by January 1, 2030.
- Requires each electric utility to meet 100 percent of its retail electric load using non-emitting and renewable resources by January 1, 2045.
- Establishes an administrative penalty equal to \$100 for each megawatt-hour for noncompliance with the three standards, adjusted for inflation.
- Amends the Utilities and Transportation Commission's ratemaking authority to include consideration of property acquired or constructed during the rate-effective period.
- Requires electrical and gas companies to use a carbon adder for planning, evaluating, and acquiring all resources.

- Presented to the Senate Environment, Energy and Technology Committee Jan 29, 2019.
- Senator Shelly Short (R), 7th District, proposed several amendments to the bill, attempting to add provisions addressing base load needs and grid stability.
- All such amendments were quickly and handily outvoted.

<https://www.tvw.org/watch/?eventID=2019011291>

Utilities w/ GHG Reduction Goals

- AEP
- AES
- Alliant
- Ameren
- AVANGRID
- CMS Energy
- Dominion
- DTE ENERGY
- Duke Energy
- Entergy
- Exelon
- Green Mountain Power
- Madison G&E
- Montana-Dakota Utilities
- National Grid
- NextEra
- NiSource
- PacifiCorp
- PG&E
- Pinnacle West
- PNM Resources
- Portland General Electric
- PSEG
- Southern California Edison
- Southern Company
- TVA
- Vectren
- WEC Energy Group
- Excel Energy



What's Coming Next?

- Nothing from Congress
- Carbon tax / carbon pricing statutes at state level
- Renewable & Clean energy standards from local governments
- GHG reduction goals from business sector, including utilities

- **Key Challenge/ Opportunity: Balancing Reliability & Sustainability**



Climate Litigation

Lawsuits in federal or state courts, brought by groups (states, local governments, citizens, environmental groups, etc.) alleging to be damaged or impacted by climate change, against industry or government, seeking reductions of environmental impacts and compensation for damages and future costs of adaptation



Climate Litigation:
Using the Courts to Address
Climate Change
Margaret Claiborne Campbell

Climate Litigation

- Theory/ Basis is not rooted in environmental laws or regulations, instead they are using federal and state Common Law.
- Tort actions: trespass, negligence, product liability, public/private nuisance
- Public Trust Doctrine

Torts

Kivalina v. ExxonMobil (2008)

- Native village sought \$400 Million for costs of relocating village due to erosion from storms and rising sea levels caused by climate change
- 9th Circuit: claims displaced by Clean Air Act



Connecticut v. AEP (2011)

- States sought CO2 emissions cap and GHG reductions
- **Supreme Court: claims displaced by CAA**

Comer v. Murphy Oil (2011)

- Land Owners and residents along Mississippi Gulf Coast sought damages for destruction from Hurricane Katrina
- **5th Circuit: dismissed as political question**

City of Oakland v. BP (2017)

- Seeking remedies for production/marketing fossil fuels with deceptive campaigns (having knowledge of climate impacts)
- **N. Dist. CA: more vast than nuisance case, solutions by legislature/executive**

County of San Mateo v. Chevron (2017)

City of New York v. BP (2018)

Public Trust Doctrine

- Principle that the sovereign holds in trust for public use some of its resources
- *Illinois Central Railroad v. Illinois*

The **ATMOSPHERE** is a **PUBLIC TRUST**



Innovative Legal Tactics



- 21 youth plaintiffs represented by Our Children's Trust and Earth Guardians brought suit against US Government for allowing activities that harmed the climate, thereby violating their rights to life, liberty, and property; seeking CO₂ reductions.
- U.S. Dist. Court of Oregon Judge Ann Aiken characterized the case as a constitutional , civil rights action involving due process under the 5th and 14th amendments.
- Opened the door for the concept that access to a clean environment with a climate system capable of sustaining human life was a fundamental right
- Government has moved to dismiss the case
- Currently delayed pending disposition of interlocutory appeals

What's Coming Next?

- After *Juliana*, more petitioners may be emboldened
- New generations of judges, decisions will reflect generational values
- Litigation, litigation, litigation \$\$\$

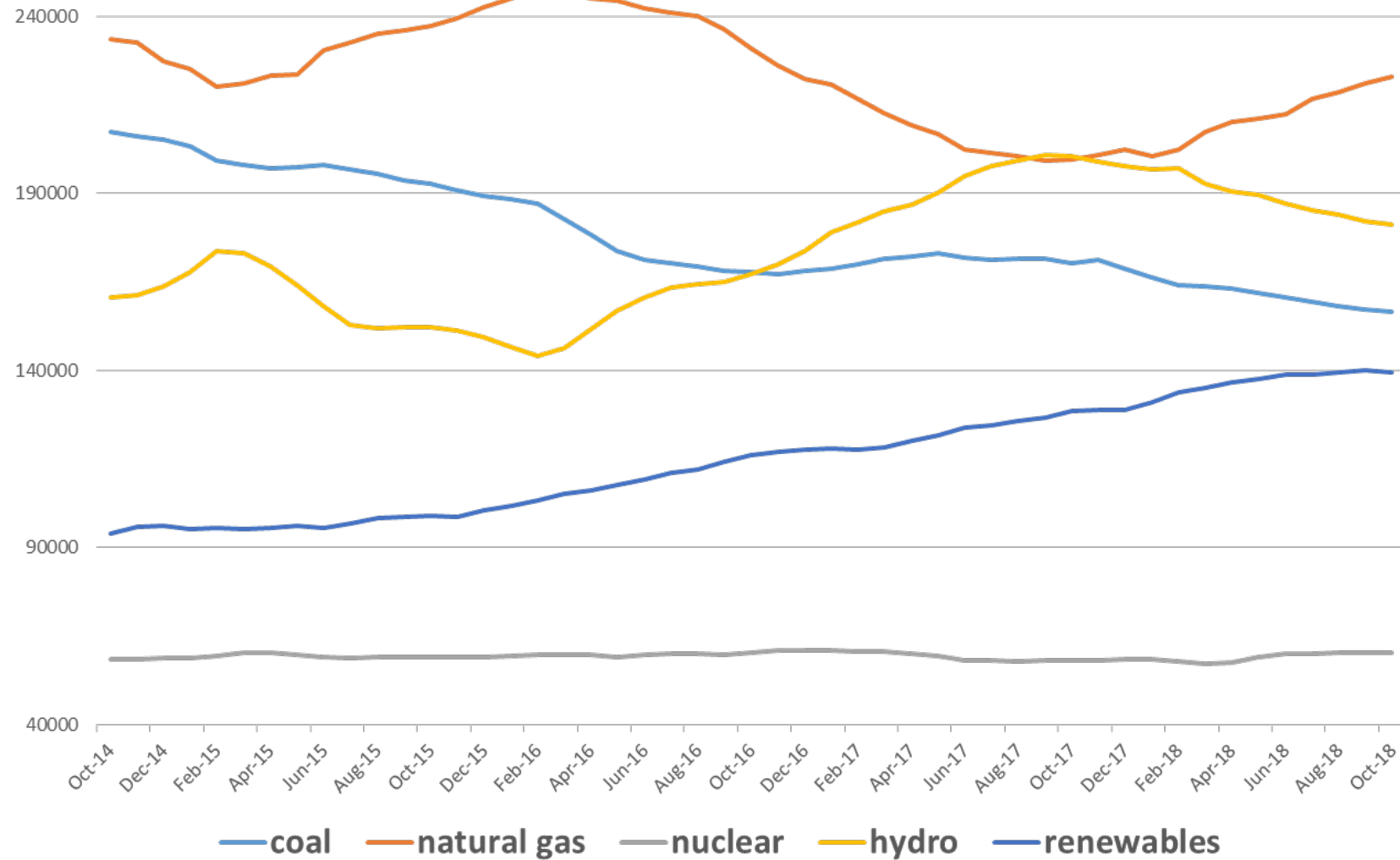
- Key Challenge/ Opportunity: Public Perception & Litigation Costs

Energy Vision 2020

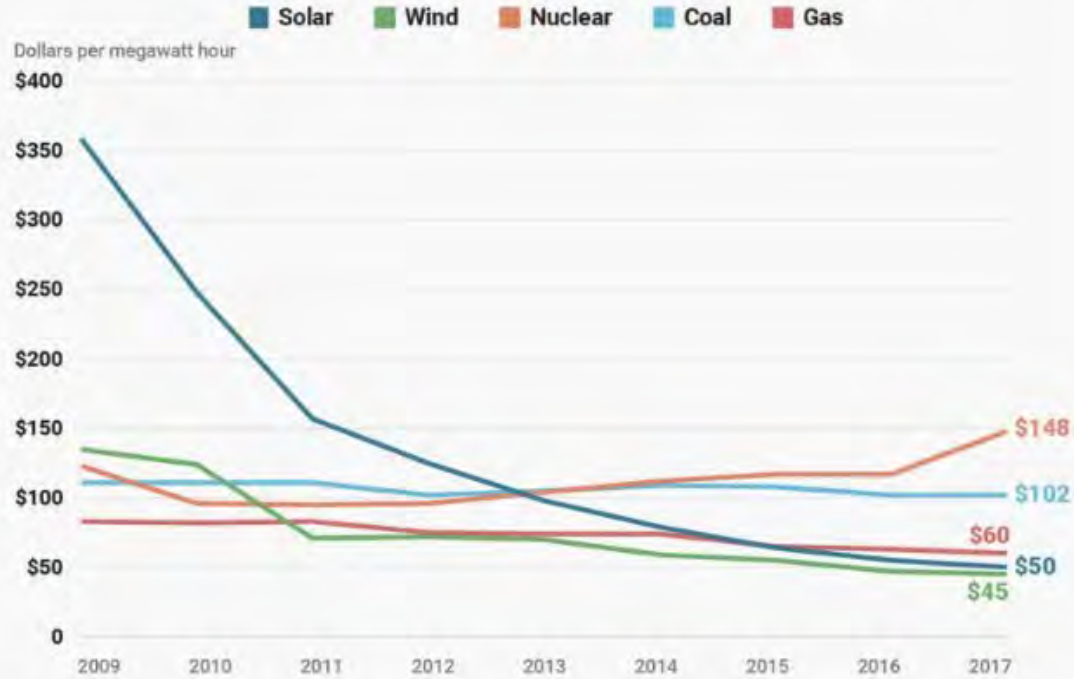
- \$3.5 Billion Investment
- Upgrading and repowering wind fleet with larger blades and improved technology
- Adding 1,150 MW of new wind resources by end of 2020



WECC Net Generation by Source
 12-month rolling average
 000 MWHrs - EIA



The average cost of energy in North America

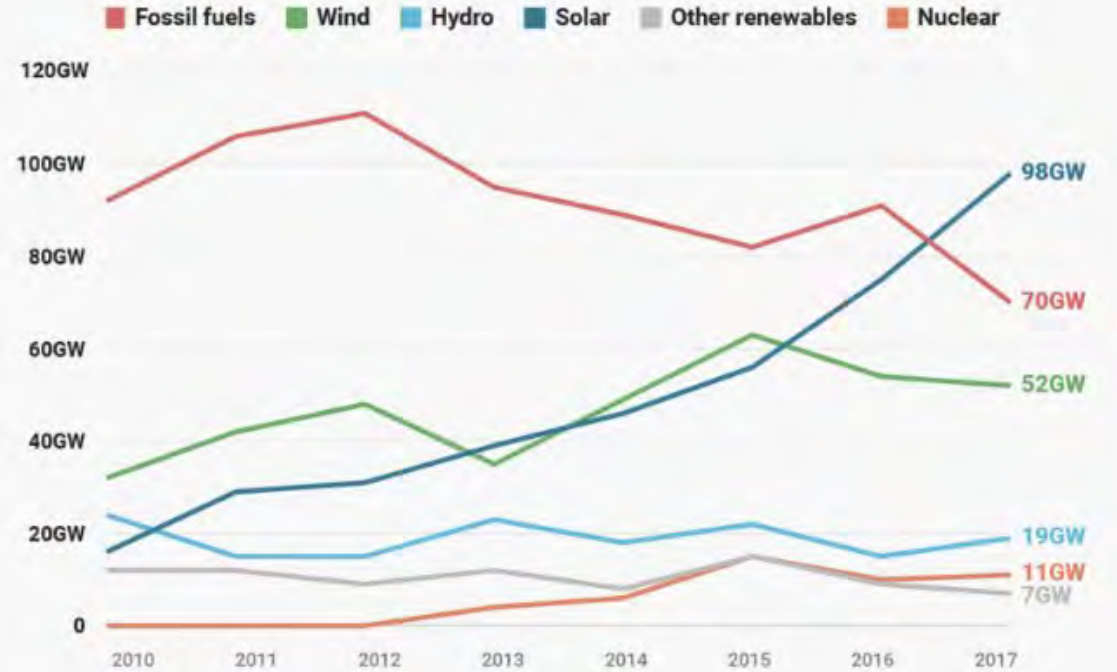


Source: Lazard levelized cost of energy analysis

BUSINESS INSIDER

Image: Shayanne Gal/Business Insider

Global growth in net electricity generating capacity



Source: CarbonBrief.org

BUSINESS INSIDER

Image: Shayanne Gal/Business Insider

Factors influencing future generation and power sector emissions in the West

- Coal unit retirements / additional pollution controls
- Capacity factors – coal and gas units
- Gas prices
- New gas units
- Nuclear retirement (Diablo Canyon (CA) – 2024-25)
- Hydro variability
- Cost of Renewables / federal tax policy for renewables
- State climate and energy policies
- Energy efficiency / demand-side management programs
- Electrification (esp. transportation)
- Transmission capacity / additions
- Regional wholesale electricity markets (EIM, day-ahead, ISO / RTO)
- Energy storage technologies and costs
- Grid modernization
- Federal energy and environmental policy
- Utility IRPs
- Corporate and city renewable energy and sustainability goals



Colorado State University

Patrick Cummins

POWERING YOUR GREATNESS

What's Coming Next?

Increasing Renewable Generation

- Solar and wind will continue to expand, but will remain unreliable; producing too much energy when its not needed, and not enough when it is needed
- Until adequate storage technologies are developed, renewables will require more reliable power sources to generate electricity to fill gaps
- High producers must pay neighbors to take solar & wind energy when they produce too much
- Plant-scale batteries are currently too expensive and don't last long enough to be considered 'reliable storage'
- **Key Challenge/ Opportunity: Managing/Embracing successful Transition**



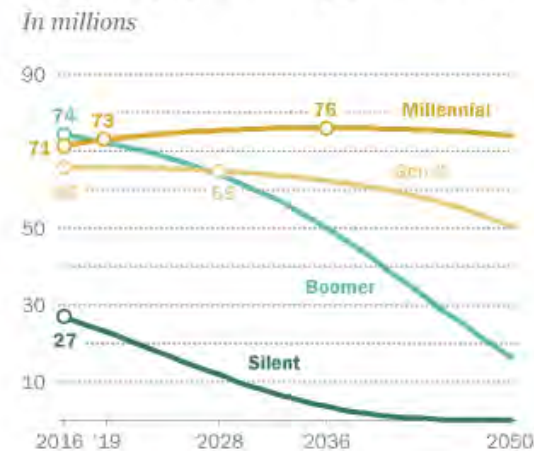
Millennials projected to overtake Baby Boomers as America's largest generation

BY RICHARD FRY

Millennials are on the cusp of surpassing Baby Boomers as the nation's largest living adult generation, according to [population projections](#) from the U.S. Census Bureau. As of July 1, 2016 (the latest date for which population estimates are available), Millennials, whom we define as ages 20 to 35 in 2016, numbered 71 million, and Boomers (ages 52 to 70) numbered 74 million. Millennials are expected to overtake Boomers in population in 2019 as their numbers swell to 73 million and Boomers decline to 72 million. Generation X (ages 36 to 51 in 2016) is projected to pass the Boomers in population by 2028.

The Millennial generation continues to grow as young immigrants expand its ranks.

Projected population by generation



Note: Millennials refer to the population ages 20 to 35 as of 2016.

Source: Pew Research Center tabulations of U.S. Census Bureau population projections released December 2014 and 2016 population estimates.

PEW RESEARCH CENTER

Changing Customer Demands

- Born from 1982 to 2000
- Over 75 million American adults
- 30% of voting age population
- 2/5 of working age population
- Urban-dwelling as opposed to rural dwelling
- World Data Lab forecasts that *“the global spending power of millennials will soon be greater than any other generation. As the principal consumers, they will shape the direction of future economy”*
- They are also shaping future policy
- Creating future laws
- These are our customers

<https://www.ft.com/content/f81ac17a-68ae-11e8-b6eb-4acfcfb08c11>

SCIENCE

The Millennial Era of Climate Politics Has Arrived

Alexandria Ocasio-Cortez outlines the fuzzy edges of a new “green dream.”

ROBINSON MEYER 4:49 PM ET



Representative Alexandria Ocasio-Cortez, a Democrat of New York, unveils her Green New Deal proposal on Capitol Hill. (JONATHAN ERNST / REUTERS)

MORE STORIES

7 Reasons Democrats Won't Pass a Green New Deal

ROBINSON MEYER

Will the Left Go Too Far?

PETER BEINART

Why the U.S. Can't Solve Big Problems

JULIAN E. ZELIZER

How to Soak the Rich

ANNIE LOWREY

- February 7, 2019 – NY Rep. Alexandria Ocasio-Cortez unveiled her ‘New Green Deal’
- Resolution (crises: climate change & social inequality)
- 5 goals
- 14 projects
- 15 requirements

What's Coming Next?

Changing Customer Demands

- Customers will Make Sustainability Demands
 - Environmental Stewardship
 - Social Justice
 - Matching Values
- 'Partner' with utilities that have similar goals
- Key Challenge/ Opportunity: Adaptation to a New Generation

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Questions?