

TRVA - TCWC

October 9, 2018

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Topics Today

- PACE Rebrands!
- Growth / Electricity prices
- TVA IRP
- Natural Gas supplies
- The 1990s are back!
- Trendy Policies
- Blue Wave?
- Federal Electricity Policy

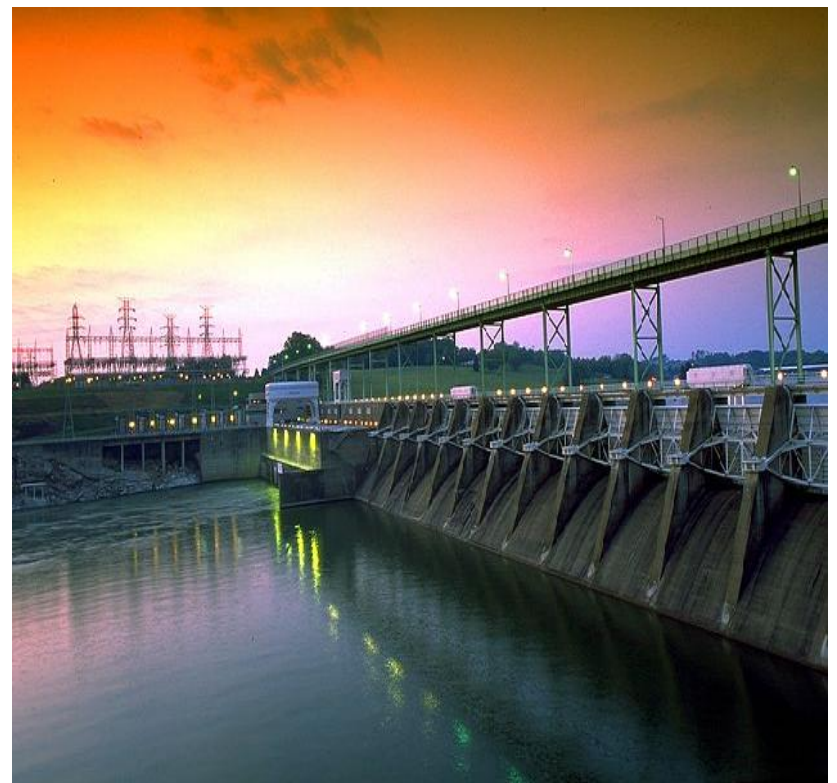




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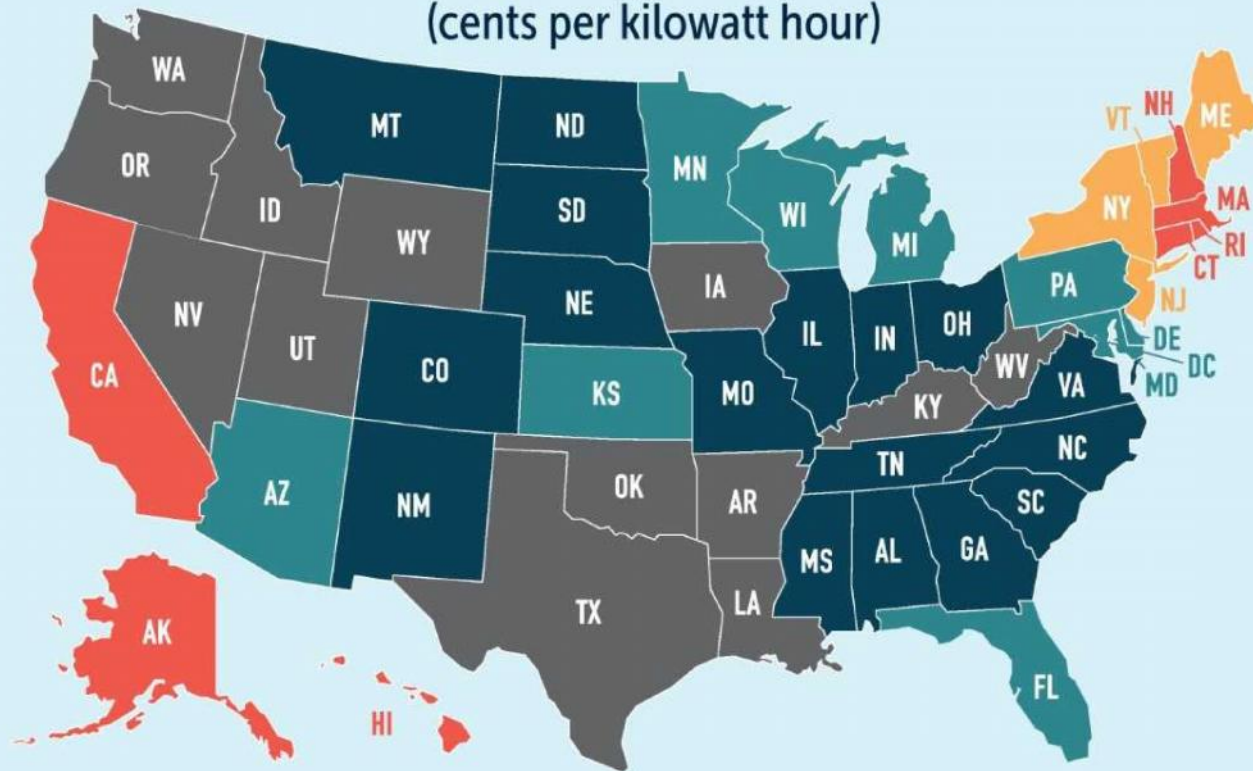
TVA IRP Process

- IRP Working Group
- Consumer Voice
- Long-Term Planning
- Pace of Change



2017 U.S. Average Electricity Retail Prices

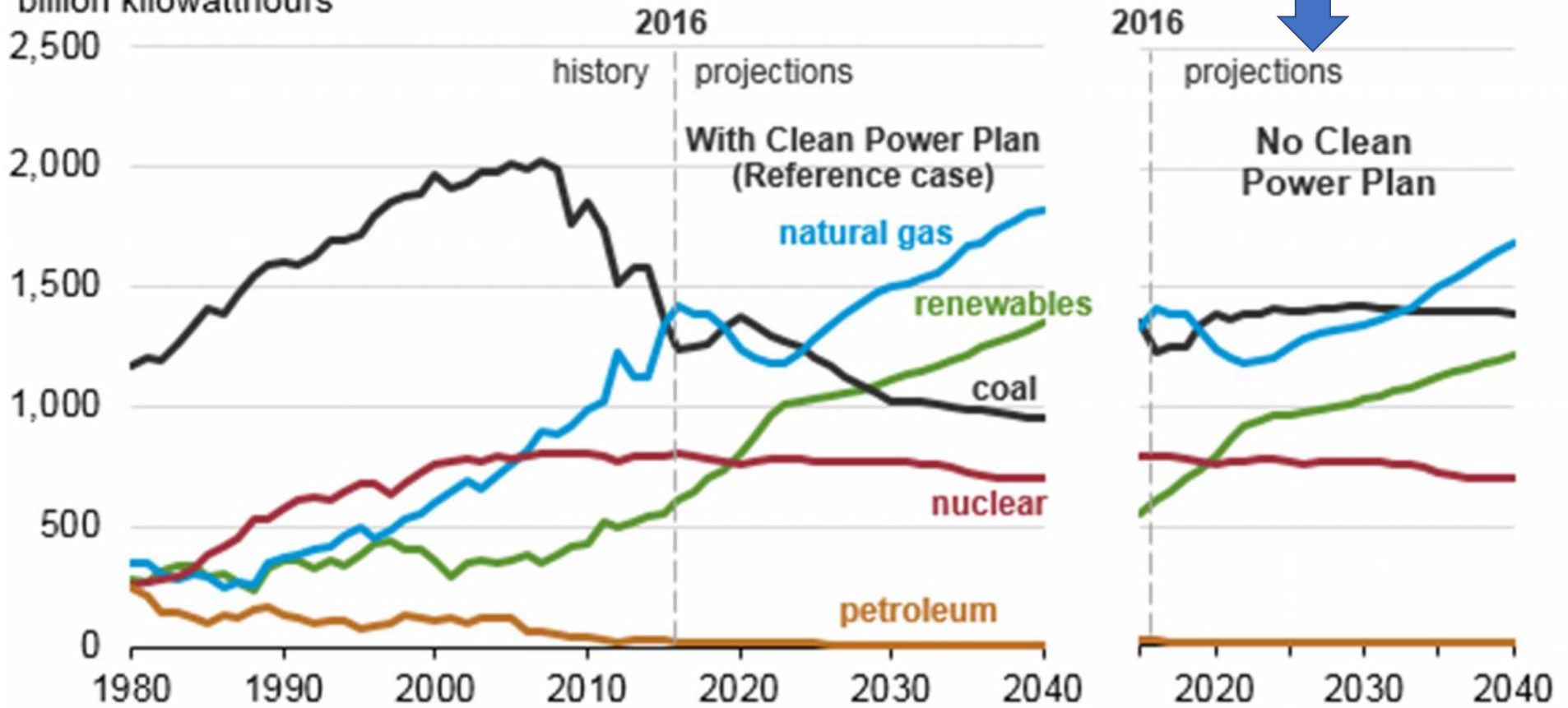
(cents per kilowatt hour)



7.00 to 9.00	12.01 to 15.00
9.01 to 10.00	15.01 and Higher
10.01 to 12.00	National Average = 10.54

Where We Are Projected to Go

U.S. net electricity generation (1980-2040)
billion kilowatthours









DEREG





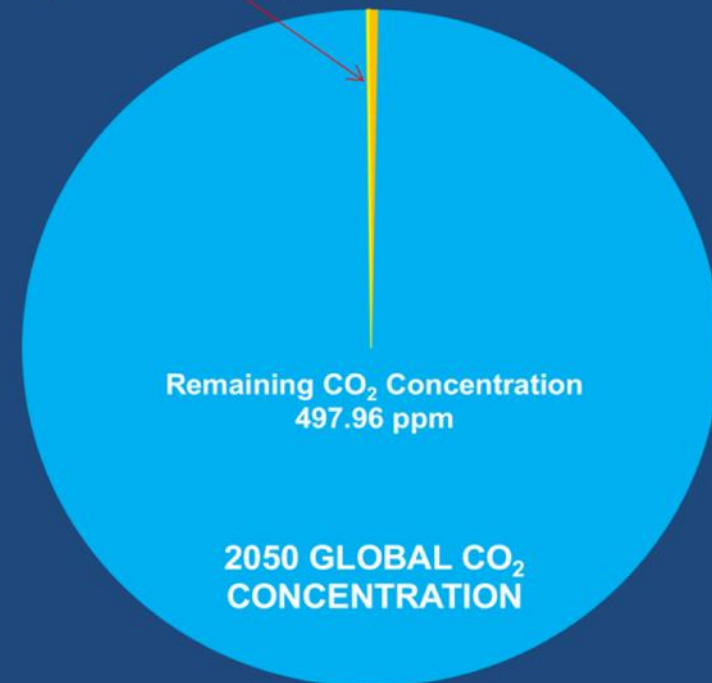
Google

Will a 100% Renewable Grid in the U.S. Measurably Impact the Climate?

CALCULATED CLIMATE BENEFITS OF TOTAL U.S. FOSSIL RETIREMENT:

- 0.4% reduction in CO₂ concentration
- Sea level rise reduced by less than 2/100th of an inch
- Global temperature reduced by 0.021 ° F
- In 2025, total annual US reductions will be offset by just more than 6 weeks of Chinese emissions

Modeled CO₂ Reduction: 2.06 ppm



" Sources: "Climate Effects" of EPA's Final Clean Power Plan, ACCCE, August 2015 (Intergovernmental Panel on Climate Change (IPCC) projected concentrations of CO₂ in 2050 from 450 to 600 ppm Statement of Karen Harbert, U.S. Chamber of Commerce, U.S. House of Representatives Comm. on Science, Space, & Technology, April 15, 2015; National Centers for Environmental Information, NOAA, Global Analysis – Annual 2014; U.S. Chamber of Commerce, Institute for 21st Century Energy, Coal-fired Power Plants Planned and Under Construction; EPA CPP RIA.

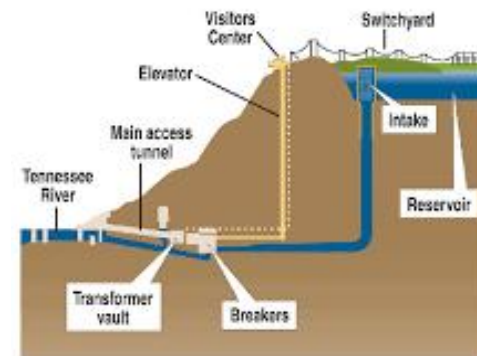
Storage – Much Work Lies Ahead

- **Extremely High Cost (Lazard Study)**
- **Dependent on Rare Earth Metals Controlled by Chinese**
- **Customization – software connectors between battery and energy source are very specific to site and function.**
- **Cars - Vehicle to grid not mature enough for IRP process.**



Pumping water for energy

When electricity demand is low, water is pumped from the Tennessee River at the base of Raccoon Mountain to the reservoir at the top. When demand is high, water is released through a tunnel in the mountain to drive generators in the plant.



U.S. Storage Snapshot

- EIA “Energy Storage Overview” presented June 5, 2018
- At end of 2017, U.S. had 664 MW of power and 742 MWh of energy in operational large-scale battery capacity.
- “The total capacity of grid-connected energy storage projects in the U.S. is equivalent to 2 percent of the nation’s electricity generation capacity.” *Environment Texas report, December 2017.*



Democrats and Energy Policy

- Rep. Cheri Bustos – Illinois
- Rep. Tim Ryan – Ohio
- Rep. Bennie Thompson - Mississippi
- House Oversight and Government Reform Committee
- House Energy and Commerce – oversight committee

Federal Electricity Policy

- Coal / Resiliency
- Nat Gas Supplies, Safety and Transportation
- Cybersecurity
- Nuclear Waste
- Tax Credits for Storage
- Endangered Species
- Broadband

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