Fact-Checking 100% Renewable Claims

Is Georgetown Really 100% Renewable and, Even if it Were, Is it Good Policy?

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Why We Are Here

Part One (Chuck McConnell):

- 100% Renewable Claims – and the reality for Georgetown and TX
- Is Georgetown a **Taker** or a **Maker**?

Part Two (Laura Schepis):

- State of the National Grid
- Reality Check on Energy Storage

Part One:

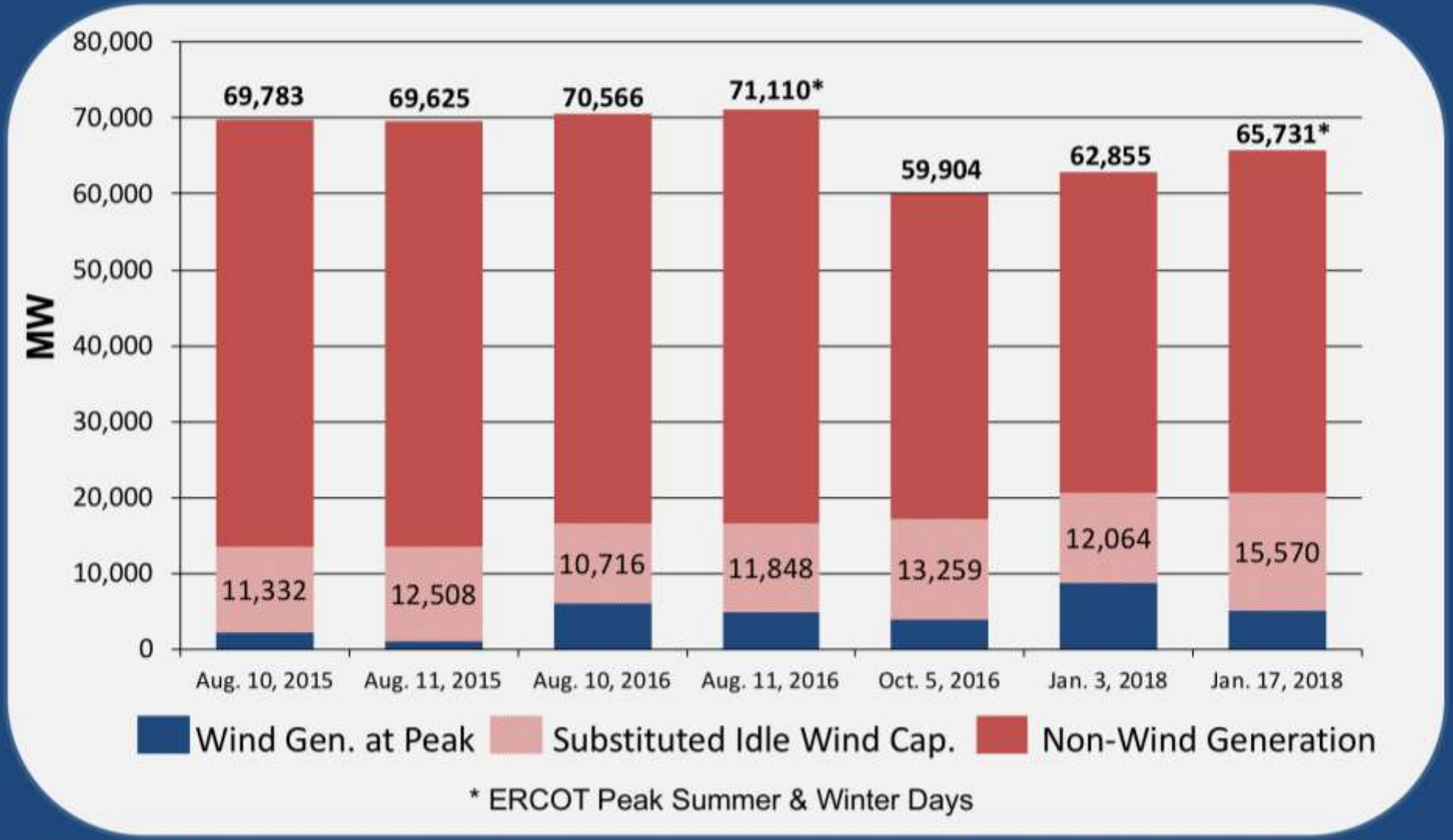
100% Renewable Claims

- No Pure Electrons
- Not Enough Wind at Peak – but “thankfully” we have the rest of Texas’ grid and supply

Is Georgetown a Taker or a Maker?

- Who is Paying for It?
- Is Georgetown Really Moving the Needle?

When Texas Has Needed Power Most – What Has kept the Lights on & Air Conditioners Running?

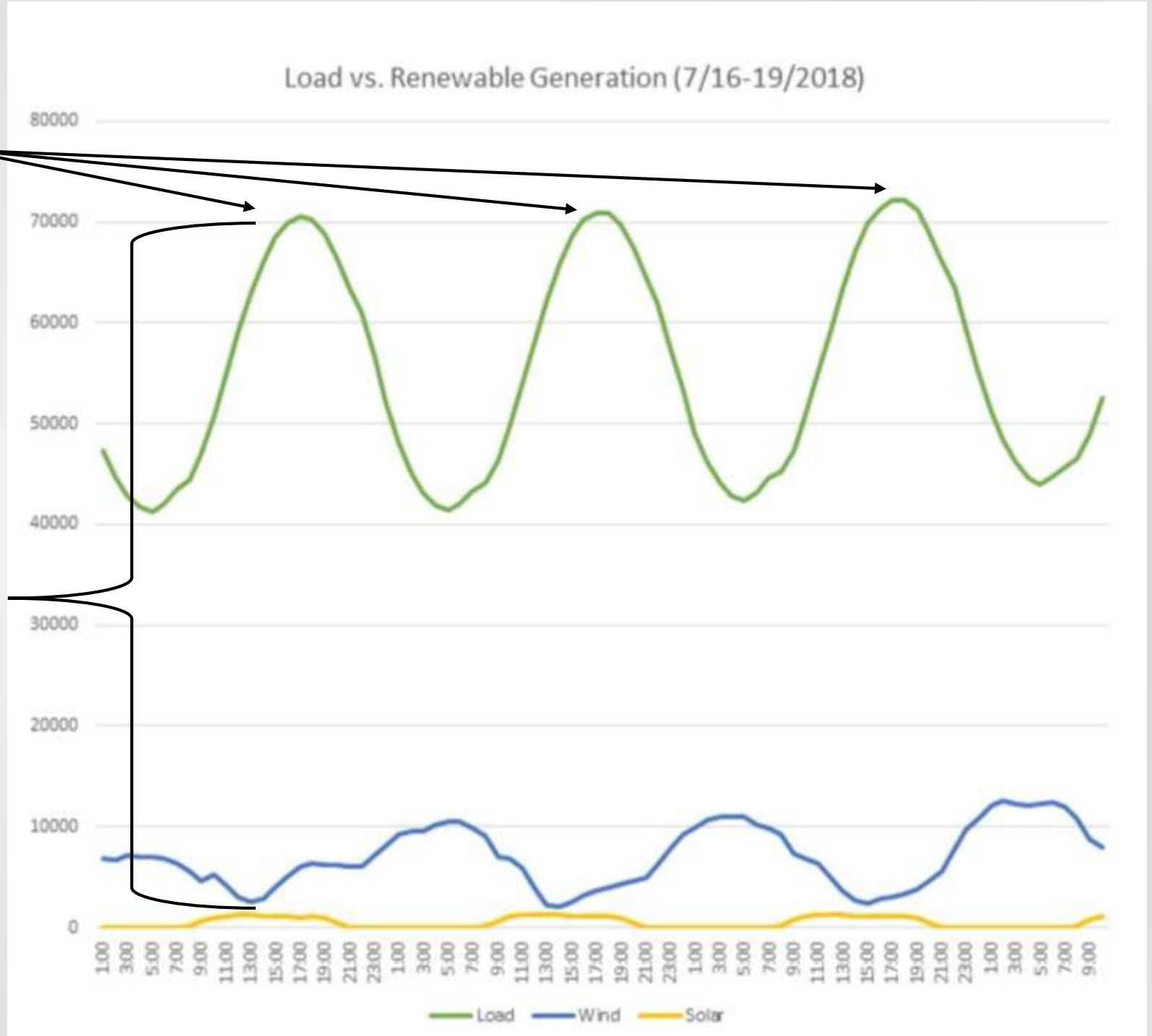


Sources: ERCOT, Daily Wind Integration Reports; ERCOT Generation Interconnection Status Reports, August 2015, August 2016, and December 2017.

Summer of 2018

- New Record Consumption Every Day! (72-74 GW!)
- Gas, Coal, and Nuclear, Meeting the Challenge (69-71 GW)
- Wind No-Show & very little Solar Results in < 5-8% of total needs.

<u>Gap</u> Between Perception & Reality Remains Huge



Who is Paying For It?

US Taxpayers: $36 Billion in Wind & Solar Tax Subsidies (2016-2020)

- Paid by all US Taxpayers (including those with no feasible way to generate wind/solar)
- Hidden in our Tax Bills (Not in our Utility Bills)

Texas Ratepayers: $7 Billion in Renewable Energy-Driven Transmission Lines

- Paid by all Texas Customers (not allocated to renewables dependent on lines)
- Nothing on Utility Bills Explaining that Cost of Renewables

Texas Property Taxpayers: $ 1.8 Billion in Chapter 313 Renewable Property Tax Breaks

- Comptroller documented this subset - there are other local tax breaks too.
- Public school finance system is impacted.
- Wind & Solar claim local benefits, but they are largely exempt from local taxes due to agreements.

The Grid: Untold Billions in System Integration Cost & Market Distortions

- Renewables not required to “balance” their intermittent power.
- Reliable sources (gas, coal, & nuclear) forced to wait to fill the gap with inadequate compensation
- Subsidy-driven negative pricing destroying capital, stranding assets, and endangering reliability.

"All Fuels Are Subsidized"
True, But What Do We Get for Our Money?

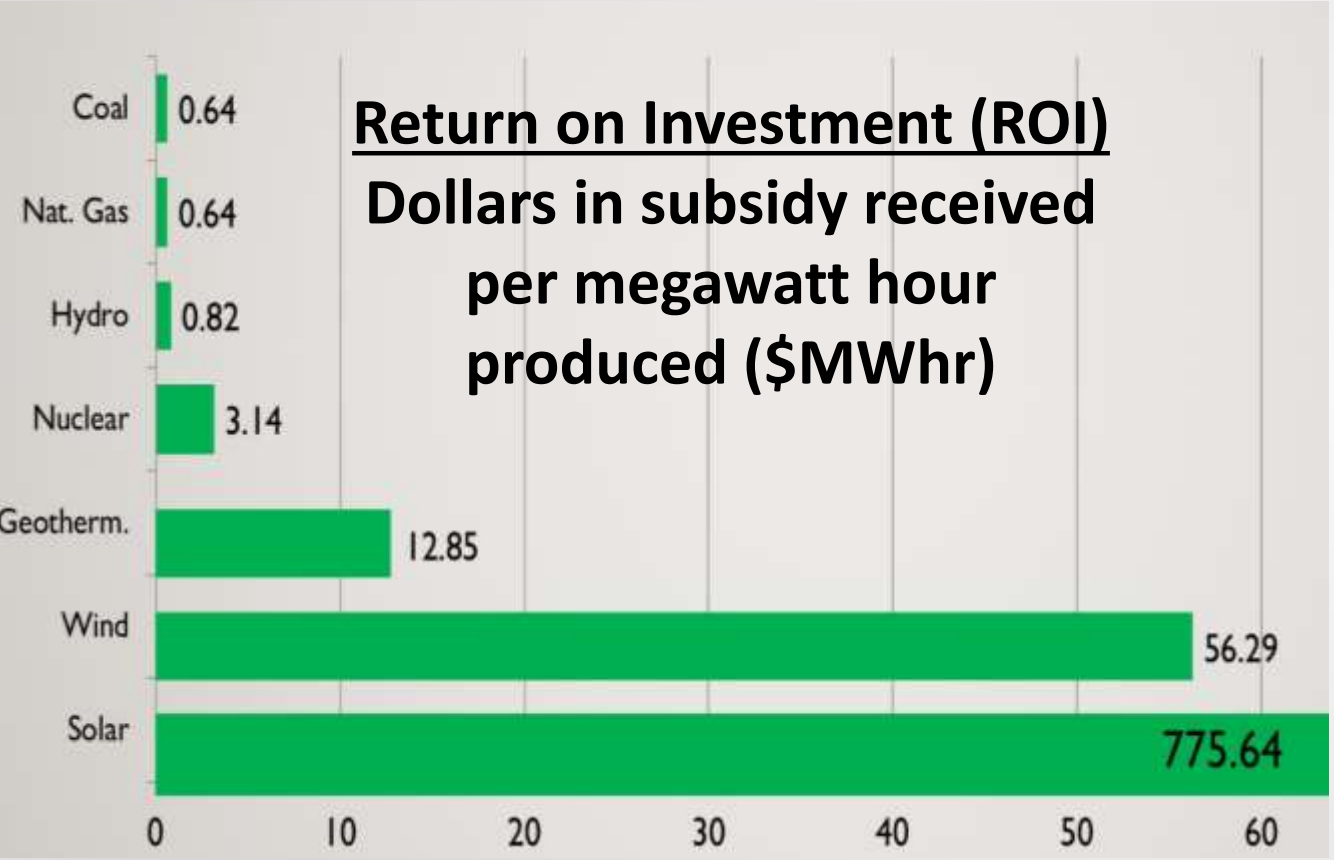


Table 3-5. Fiscal Year 2013 Electricity Production Subsidies and Support[177]

Beneficiary	Direct Expenditures	Tax Expenditures	Research and Development	Federal and RUS Electricity	Total	Share of Total Subsidies and Support
Renewables	7,408	3,373	722	176	11678	72%
Biomass	62	9	47	-	118	1%
Geothermal	221	22	2	-	245	2%
Hydropower	194	17	10	171	392	2%
Solar	2,448	1,712	234	-	4393	27%
Wind	4,274	1,614	49	-	5936	37%

Table 3. Comparing Energy Production and Energy Tax Incentives: Fossil Fuels and Renewables

2016

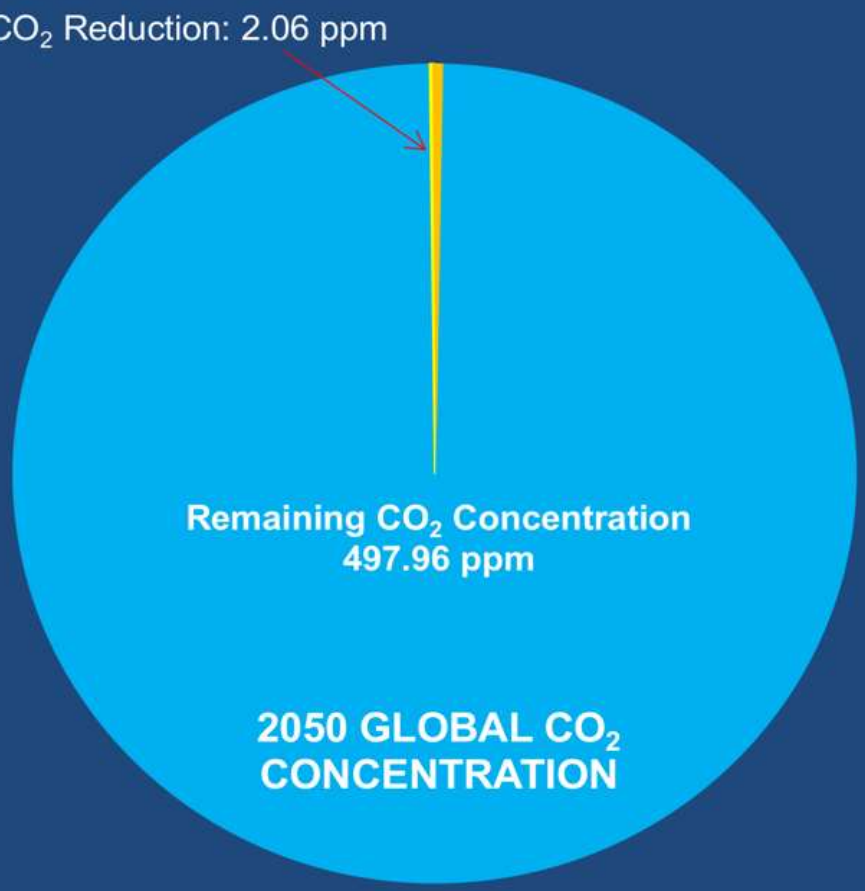
	Production		Tax Incentives	
	Quadrillion Btu	% of Total	Billions of Dollars	% of Total
Fossil Fuels	65.6	77.9%	$5.2	28.6%
Renewables	10.1	12.1%	$11.4	62.6%
Renewables (excluding hydroelectric)[a,b]	7.7	8.7%	$11.4	62.6%
Renewables (excluding biofuels and related tax incentives)	7.9	9.0%	$7.8	42.9%
Renewables (excluding hydroelectric and biofuels and related tax incentives)	5.4	6.1%	$7.8	42.9%
Nuclear	8.4	10.0%	$0.2	1.1%

Sources: Institute for Energy Research (2011)(based on EIA data); Congressional Research Service (2017); Department of Energy (2018).

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 CO_2 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



" Sources: "Climate Effects" of EPA's Final Clean Power Plan, ACCCE, August 2015 (Intergovernmental Panel on Climate Change (IPCC) projected concentrations of CO_2 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.

Part Two:

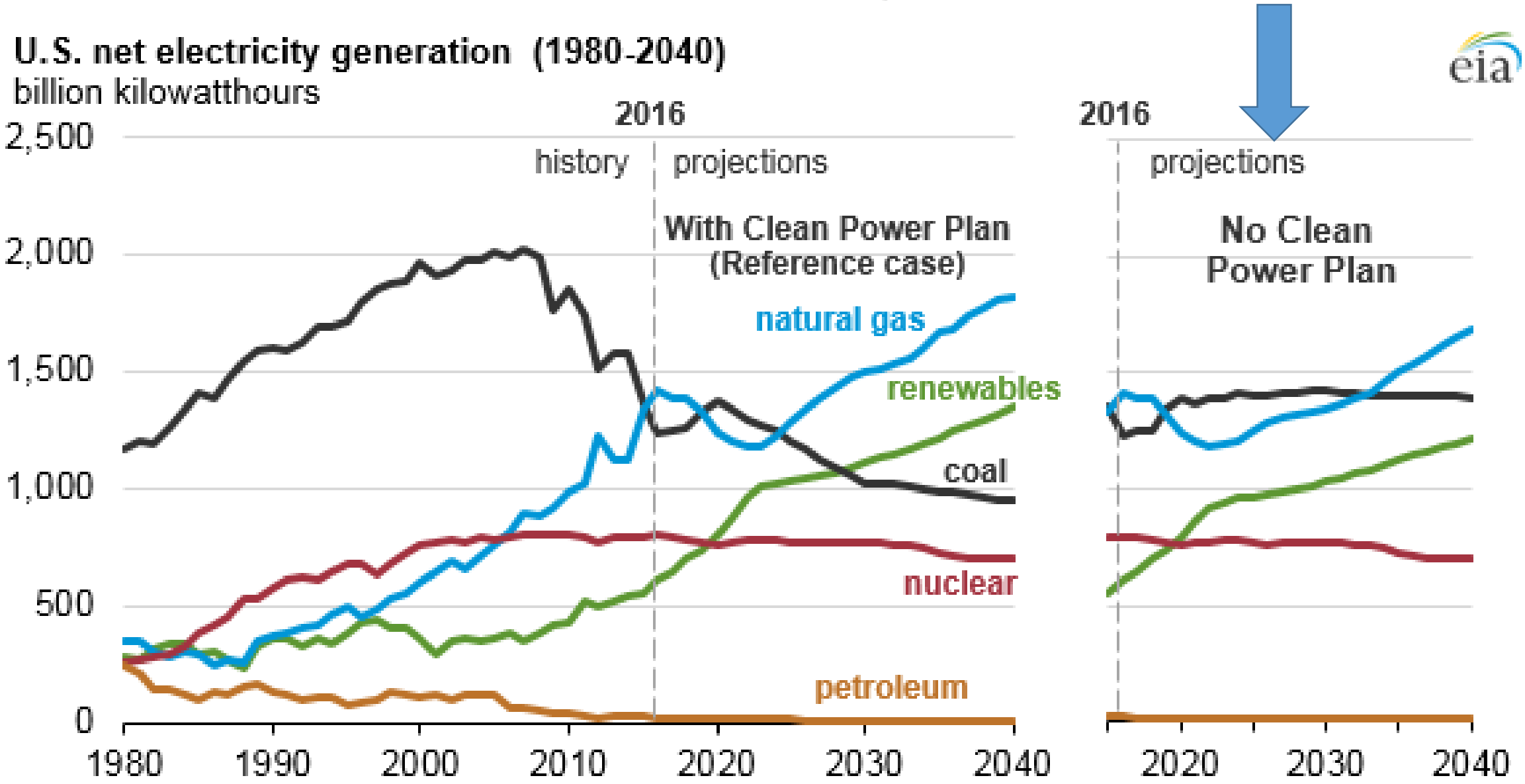
State of the National Grid

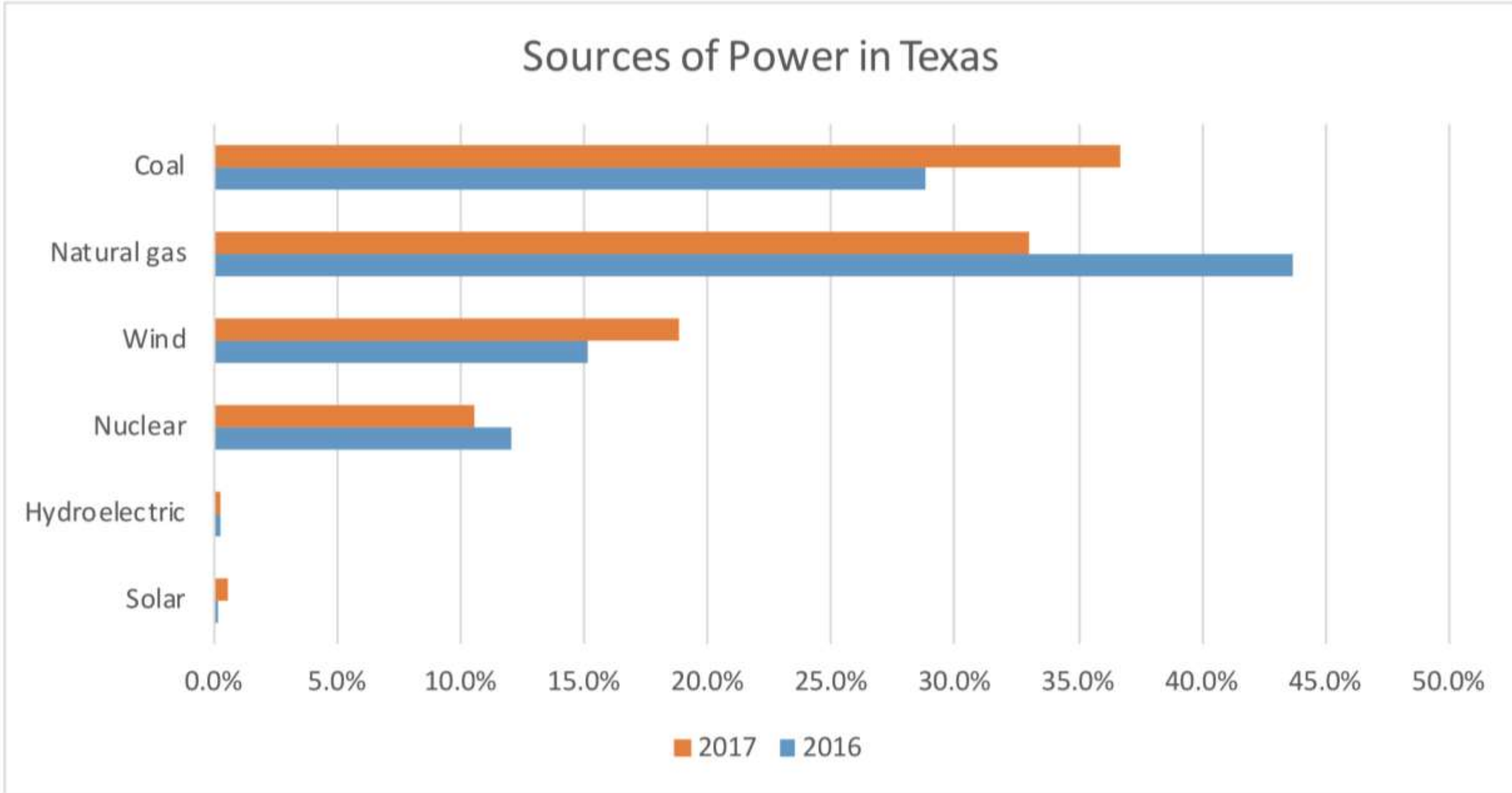
- Where We Are Projected to Go
- Expert Studies on Feasibility of 100% RE

Reality Check on Energy Storage

- Only Way to Conceive of 100% RE
- Very Long Way to Go

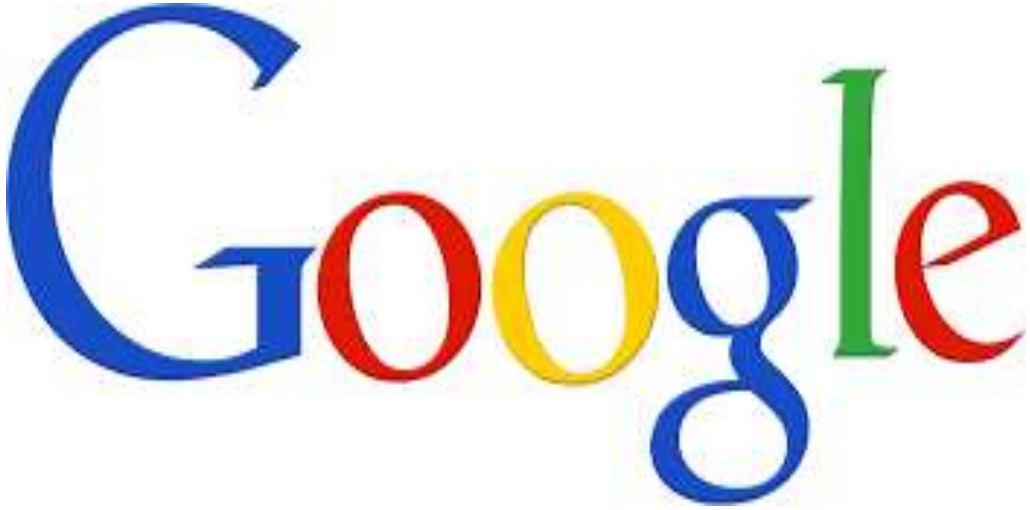
Where We Are Projected to Go





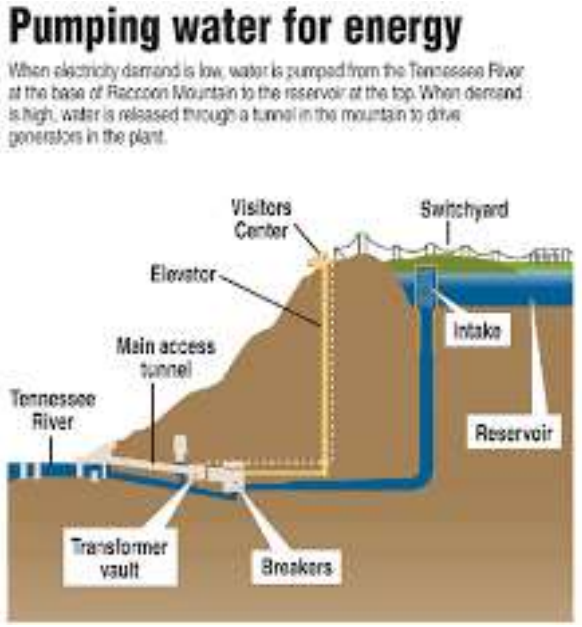
Source: *Dallas Morning News*

Expert Studies - Feasibility of 100% RE



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.**



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.*

Texas / ERCOT Storage Snapshot

EIA's 2018 report concluded that ERCOT had:

- 83MW of large-scale battery storage
- 41MWh of large-scale battery storage energy capacity.

Remember: Gap Between Peak Needs and Wind/Solar Production in ERCOT is . . . **69,000-71,000 Megawatts!**