



# Texas Solar Market Update

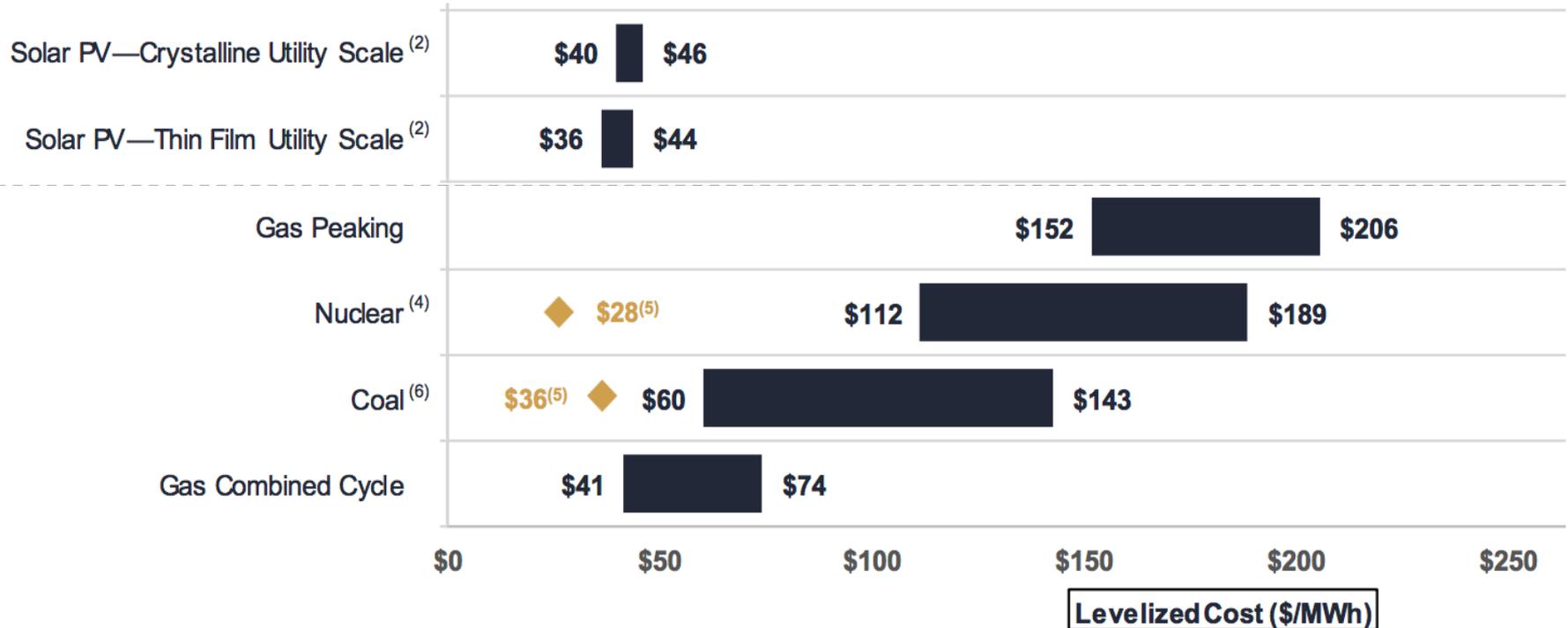
2019 TXSES Annual Meeting

*2/2/19*





# Solar is cost-competitive with new natural gas and existing coal units



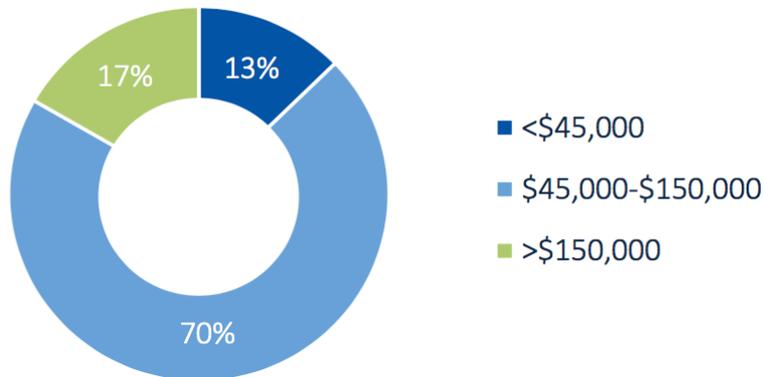
Note: Unsubsidized cost of new build for each resource; point values for coal and nuclear indicate the midpoint of the marginal cost of operating fully depreciated facilities

Source: Lazard Levelized Cost of Electricity Ver. 12.0



# Residential solar demographics

- Data gathered from the four leading states for residential solar shows that there are nearly as many low-income solar customers as high-income with the vast majority being in the middle



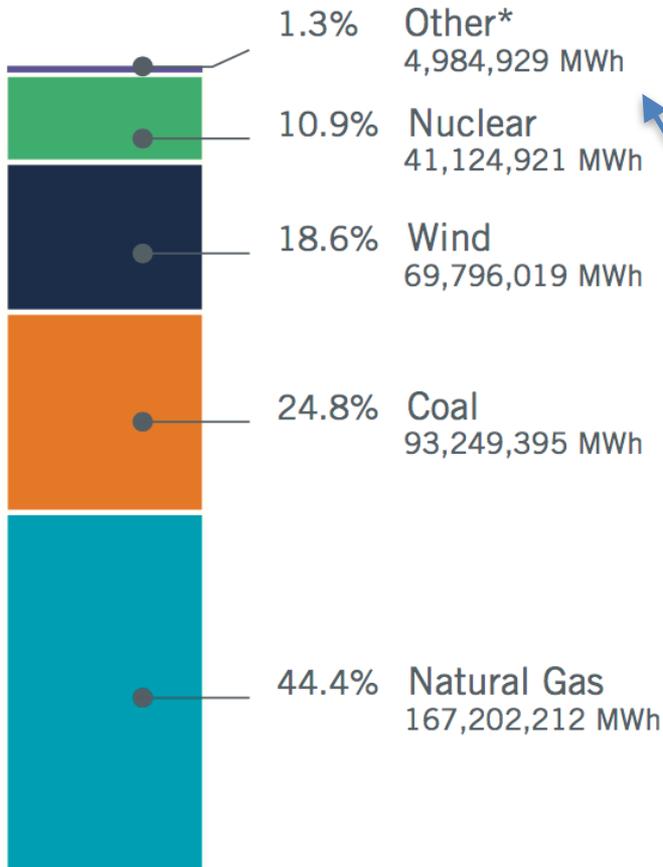
*Analysis of 521,000 solar installations from CA, MA, NJ, and NY, representing 41% of all solar projects nationwide*

- Another study of 13 states found that the median income of PV customers was just 10% higher than the median owner-occupied homeowner in 2016 with the gap shrinking every year from 2010-2016. In 4 of the 13 states studied the gap had disappeared completely.

*Sources: GTM Research / PowerScout: How Wealthy Are Residential Solar Customers, Apr 2017;  
LBNL: Income Trends of Residential PV Adopters, Apr 2018*



# Texas Solar in Context: ERCOT Energy Use



In 2018, solar provided 0.86% of ERCOT electricity generation. In comparison:

Natural gas:	52x
Coal:	29x
Wind:	22x
Nuclear:	13x

Still in the “other” wedge but busting out soon!



## Looking back on Summer 2018: Solar produced on peak as expected

	Final 2018 Summer SARA	2018 Actual Peak Demand (7/19/18)	Increase / (Decrease)
Total Resources, MW	78,184	77,558	(626)
Thermal and Hydro	66,457	65,200	(1,257)
Private Use Networks, Net to Grid	3,298	3,019	(279)
Switchable Generation Resources	2,727	3,057	330
Wind Capacity Contribution	4,193	4,229	36
Solar Capacity Contribution	1,120	1,136	16
Non-Synchronous Ties	389	917	528
Peak Demand, MW	72,756	73,308	552
Reserve Capacity, MW	5,428	4,250	(1,178)

Source: ERCOT



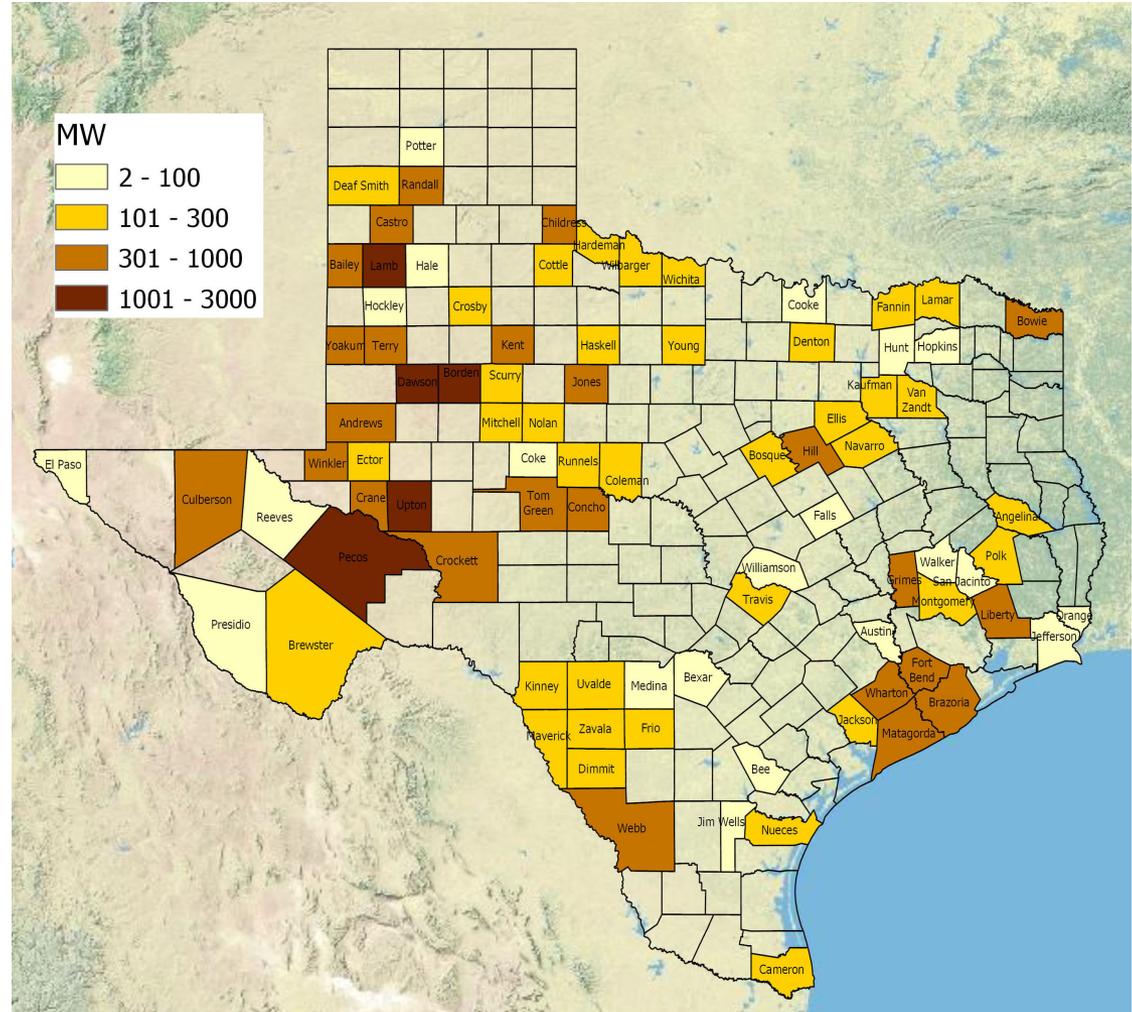
# Recent Announcements

- ExxonMobil and Shell Energy announce PPAs for 500+ MW of large-scale solar generation; Oxy building 16 MW solar plant
- Sysco signs deal with NRG for 25 MW solar at three sites
- New Braunfels Utilities organizes combo 500 MW solar RFP with Bryan, Denton, Garland, and Kerrville
- Brazos Electric Power Co-op signs PPA for 94 MW on behalf of CoServ and seven of their other distribution co-op members
- IKEA announces plan for 1.72 MW rooftop solar installation on new San Antonio store



# Looking Ahead: Power Plant Development Pipeline

- As of January 2019, Texas has over 45,000 MW of solar projects in development
- 87 counties have projects online or in recent development



Source: ERCOT, SPP, MISO, EPE

*Note: map includes projects online and those in development through Oct 2018 with full interconnection study completed or underway*



# Solar is making a difference: ERCOT Peak Capacity Projections

	2019 MW	2020 MW	2021 MW	2021 %
<b>Natural Gas</b>	51,864	51,774	53,746	62.8%
<b>Coal</b>	14,298	14,298	14,298	16.7%
<b>Nuclear</b>	4,960	4,960	4,960	5.8%
<b>Wind</b>	3,073	4,153	4,537	5.3%
<b>Wind-Coastal</b>	1,862	2,510	2,769	3.2%
<b>Solar</b>	<b>1,299</b>	<b>3,393</b>	<b>4,141</b>	<b>4.8%</b>
<b>Hydro</b>	463	463	463	0.5%
<b>Other</b>	430	430	430	0.5%
<b>Biomass</b>	202	202	202	0.2%
<b>Storage</b>	0	0	0	0.0%
<b>Total</b>	78,450	82,182	85,546	
<b>Reserve margin</b>	7.4%	10.0%	11.6%	

Solar peak capacity is projected to grow by over 2,800 MW by 2021, reaching almost 5% of ERCOT's total and boosting low reserves

Source: ERCOT Capacity, Demand, Reserves report December 2018. Reserve margin values adjusted to account for recent announcement of 470 MW coal generation entering mothball status. Target reserve margin = 13.75%



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