

Wind Energy and Transmission Infrastructure

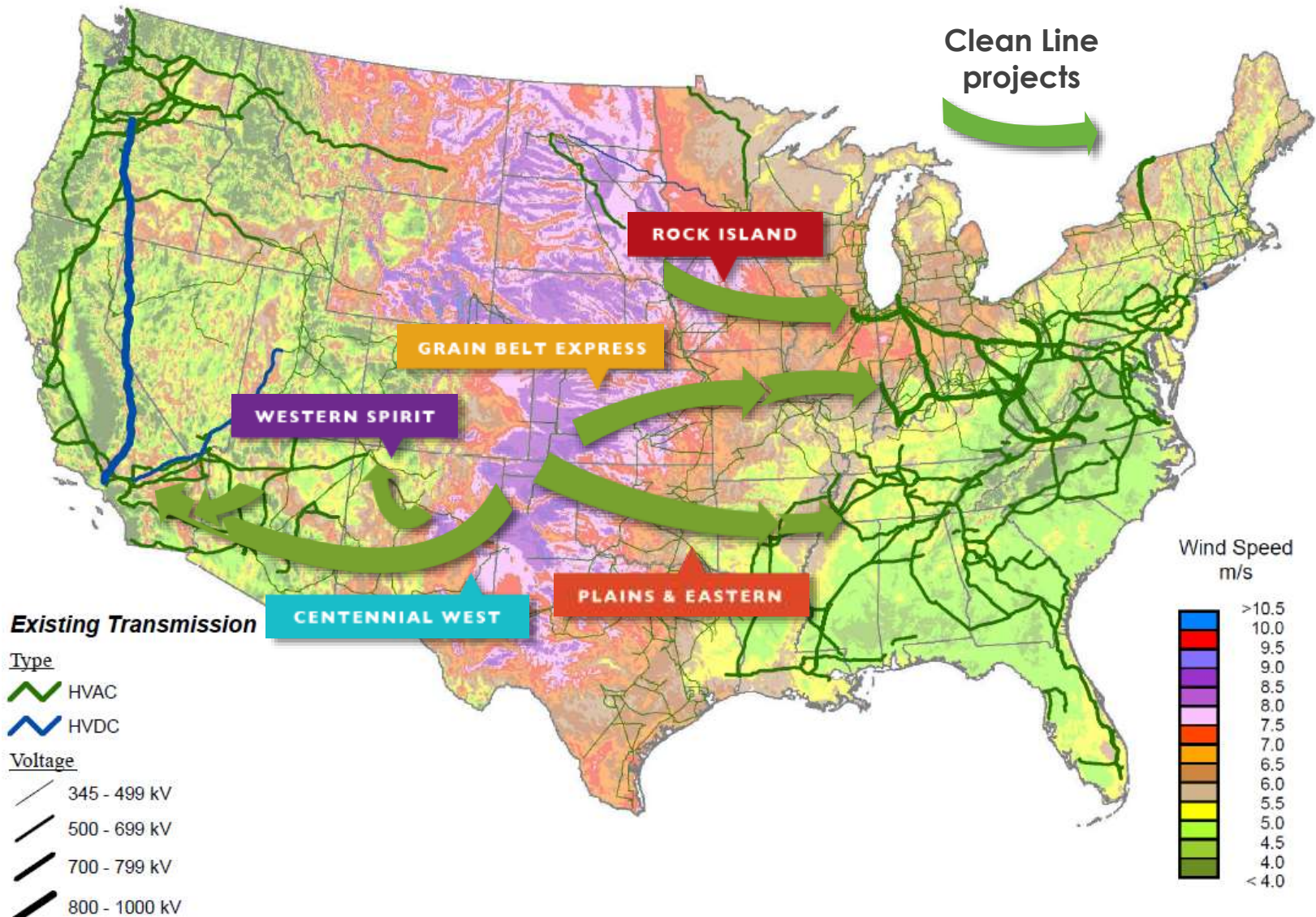
Mario Hurtado
Co-Founder & Executive Vice President

NASEO Annual Conference
New Orleans September 2017

CLEAN LINE
ENERGY PARTNERS

The logo for Clean Line Energy Partners features the company name in a sans-serif font. Below the text are two curved, overlapping lines in a light green color, suggesting a stylized path or energy flow.

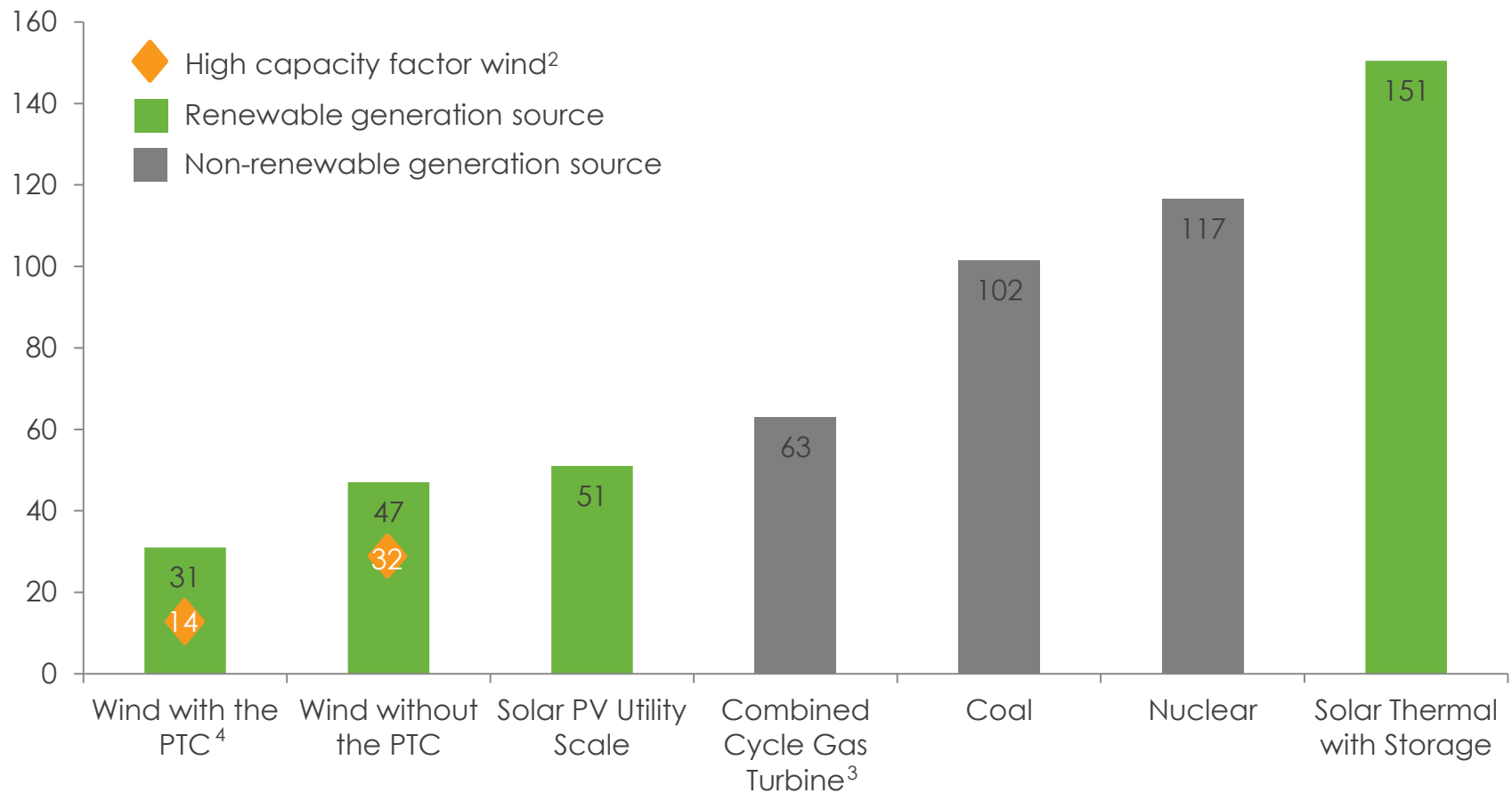
Clean Line develops market-based infrastructure projects to deliver low-cost energy to market



Wind energy cost is very attractive compared with other sources of new generation

Levelized Cost of Energy¹

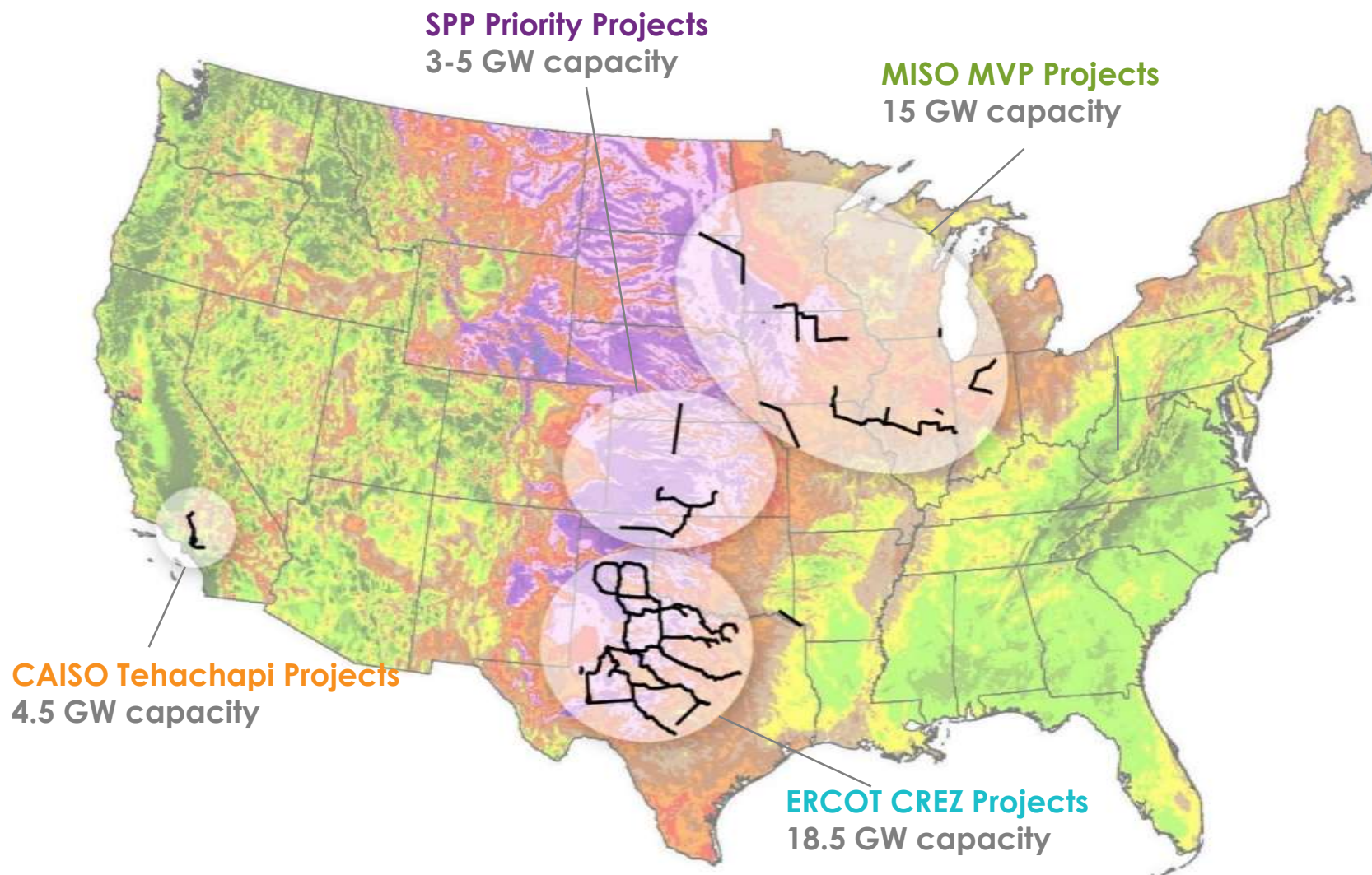
\$/ MWh



1. Cost of generation based on mid-point of Lazard's LCOE estimates. Unless noted, costs shown are unsubsidized.
2. High capacity factor wind cost uses low-end Lazard estimates for which the capacity factor is 55% and capital cost is \$1,250/kW.
3. Assumes \$3.45/MMBtu gas price.
4. Assumes 100% PTC value

Source: Lazard's 2016 Levelized Cost of Energy Analysis

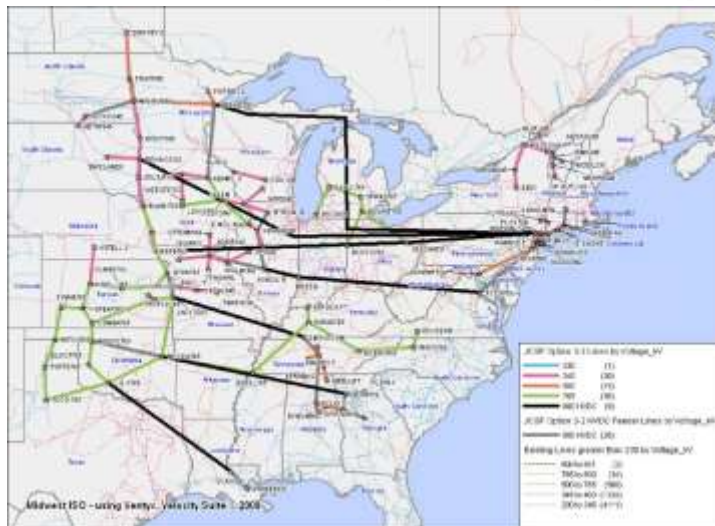
Transmission expansion has met regional renewables demand; a need for interregional transmission remains



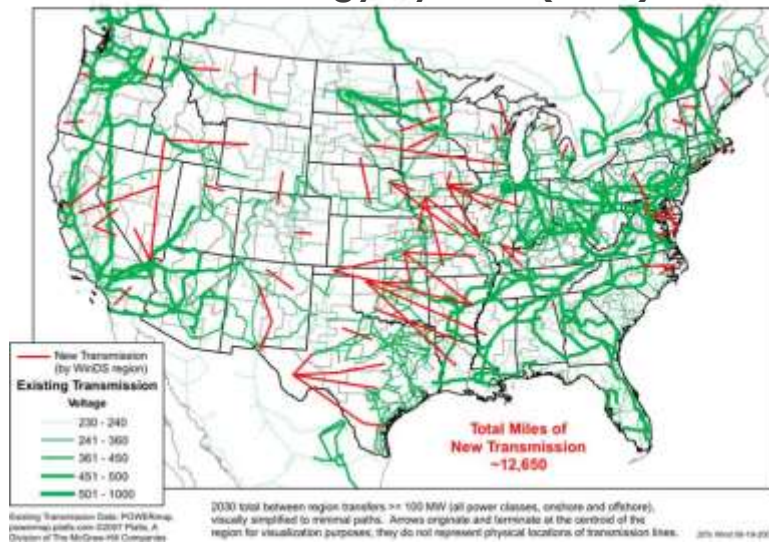
Sources: Transmission capacity based on <http://www.texascrezprojects.com/>, SPP Priority Projects Phase II Report, <https://www.sce.com/wps/portal/home/about-us/reliability/upgrading-transmission/TRTP-4-11/>, and MTEP 14 MVP Triennial Review, September 2014. Wind online or with signed interconnection agreement from SPP, MISO, and CAISO generation queues and ERCOT April 2014 System Planning Report

Studies point to need for more inter-regional projects to increase wind energy in a cost effective way

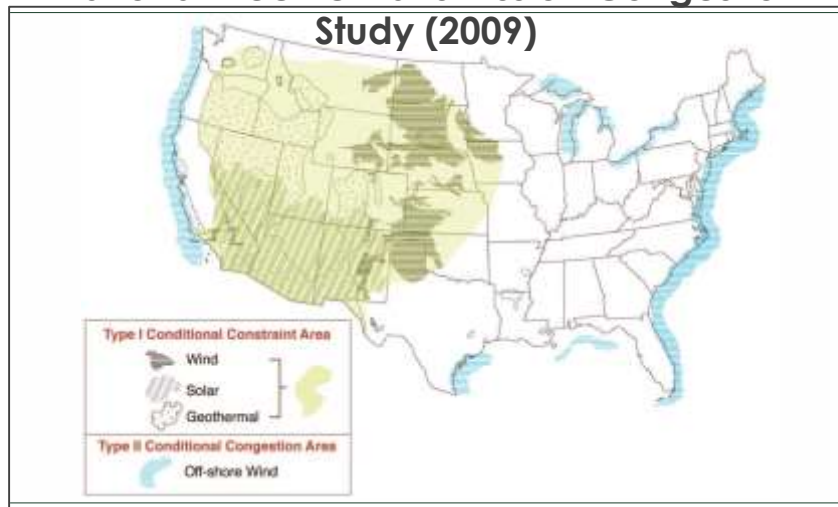
Joint Coordinated System Plan (2008)



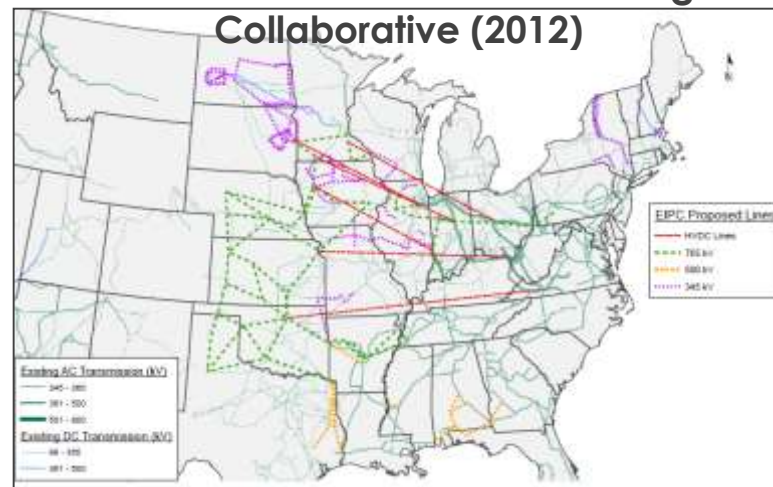
20% Wind Energy by 2030 (2008)



National Electric Transmission Congestion Study (2009)

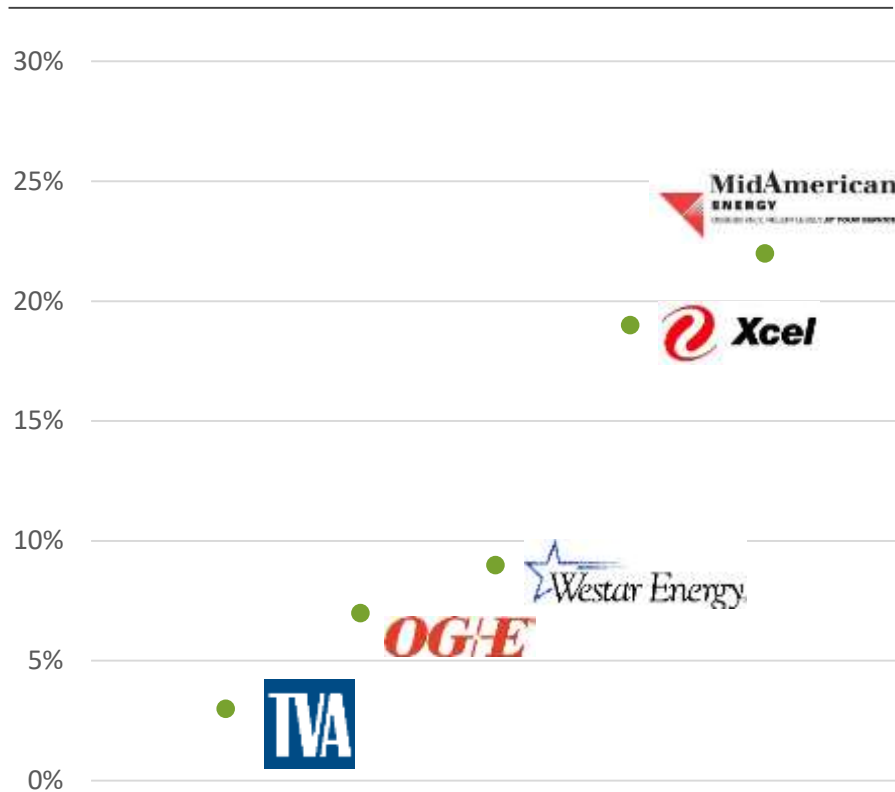


Eastern Interconnection Planning Collaborative (2012)

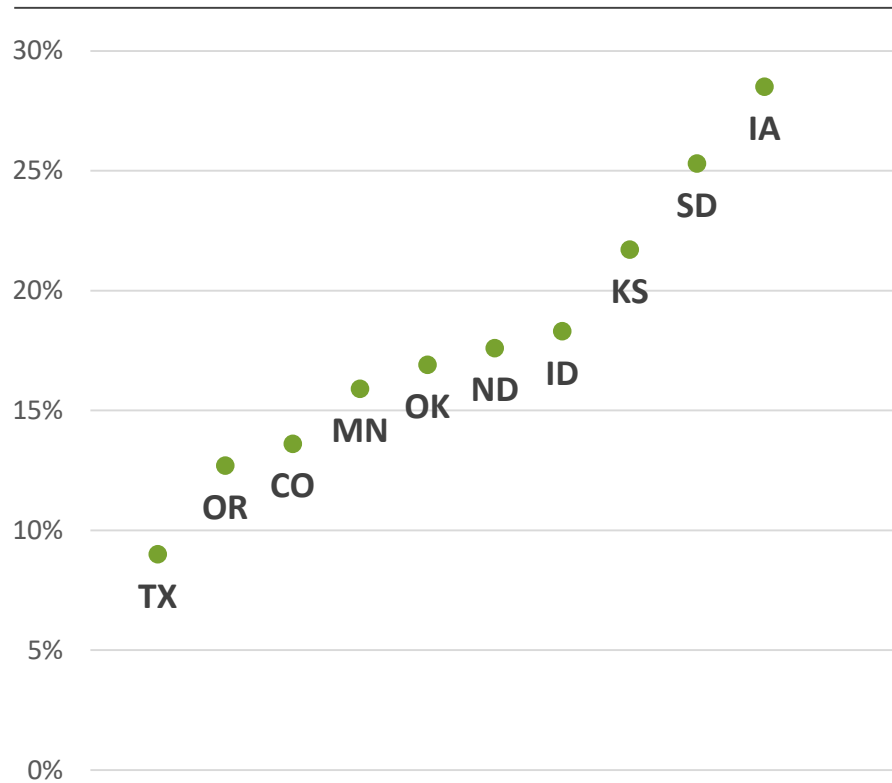


Utilities and states are already reliably integrating wind at high penetration levels

% of Utilities' Energy Generation from Wind



% of States' Energy Generation from Wind

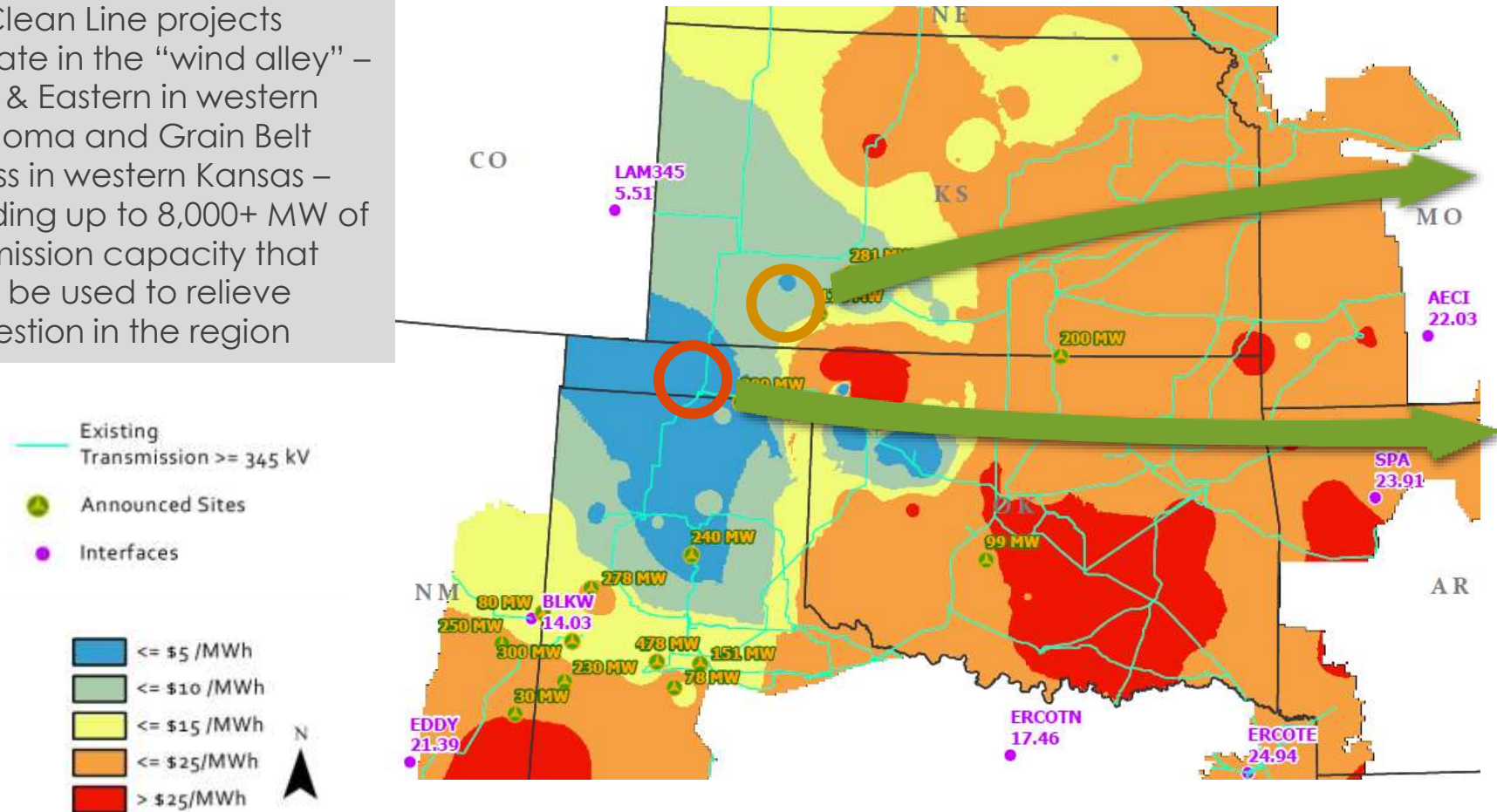


Adding wind to the resource mix offers reliability benefits for utilities. Wind has increased system reliability during extreme weather events in Texas and PJM.

Significant congestion in western SPP could see some relief from Clean Line projects

SPP Rolling 12-month Wind Weighted LMPs¹  PLAINS & EASTERN  GRAIN BELT EXPRESS

Two Clean Line projects originate in the “wind alley” – Plains & Eastern in western Oklahoma and Grain Belt Express in western Kansas – providing up to 8,000+ MW of transmission capacity that could be used to relieve congestion in the region



Sources: SPP, Ventyx. May 2017

1. SPP aggregate wind production weighted average of hourly nodal SPP LMPs from 5/1/2016 - 4/30/2017

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www.plainsandeasterncleanline.com

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