

# Eolian Energy

## Interconnection Obstacles

May 2022 – NEECE

Sam Lines – SVP for Eastern Markets

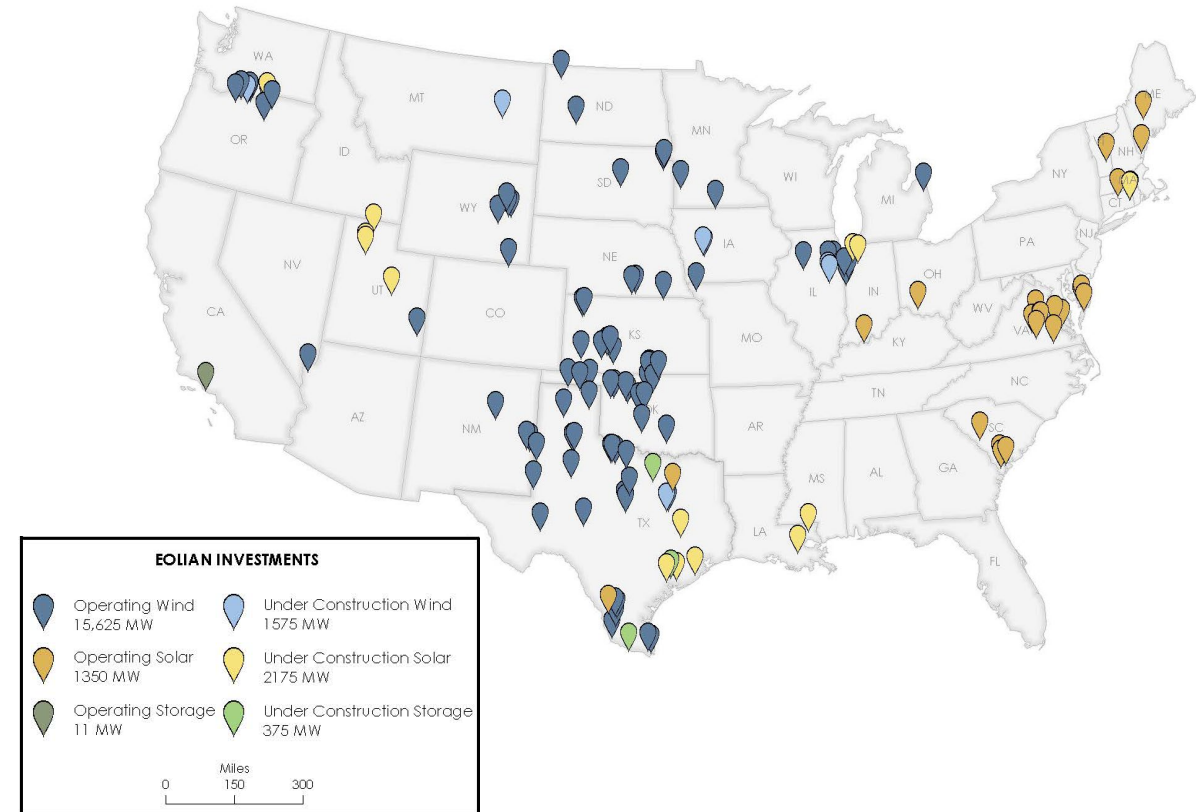
[sam.lines@eolianenergy.com](mailto:sam.lines@eolianenergy.com)



# Eolian, L.P. (Eolian)

Eolian owns and operates a growing portfolio of energy storage projects and invests in the most experienced renewable energy development teams in the U.S. For nearly 20 years, Eolian's founding management has worked together to build the assets at the core of the company, creating unique and proprietary structures that have directly funded the development of more than 21,000 MW of successfully operating energy storage, solar and wind generating capacity across the country.

*eolian*



# Backed by Global Infrastructure Partners (GIP)

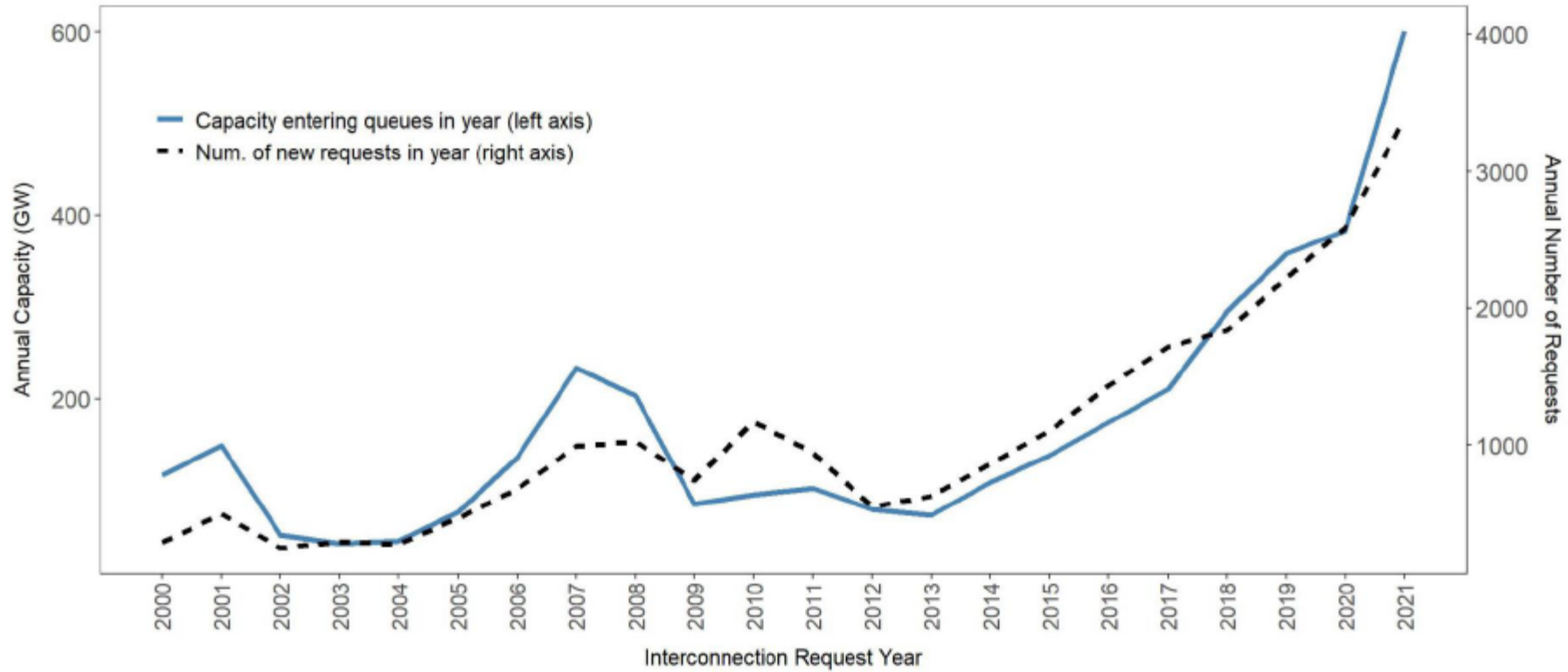
Eolian is owned by its employees and funds managed by GIP, one of the largest private infrastructure investors in the world. GIP has approximately \$81 billion in assets under management and its funds currently own 40 portfolio companies that have combined annual revenues of approximately \$40 billion and employ in excess of 58,000 people. GIP has offices around the world with major hubs in New York, Stamford, London, Sydney, Hong Kong and Mumbai.



GLOBAL  
INFRASTRUCTURE  
PARTNERS



# Interconnection Scale

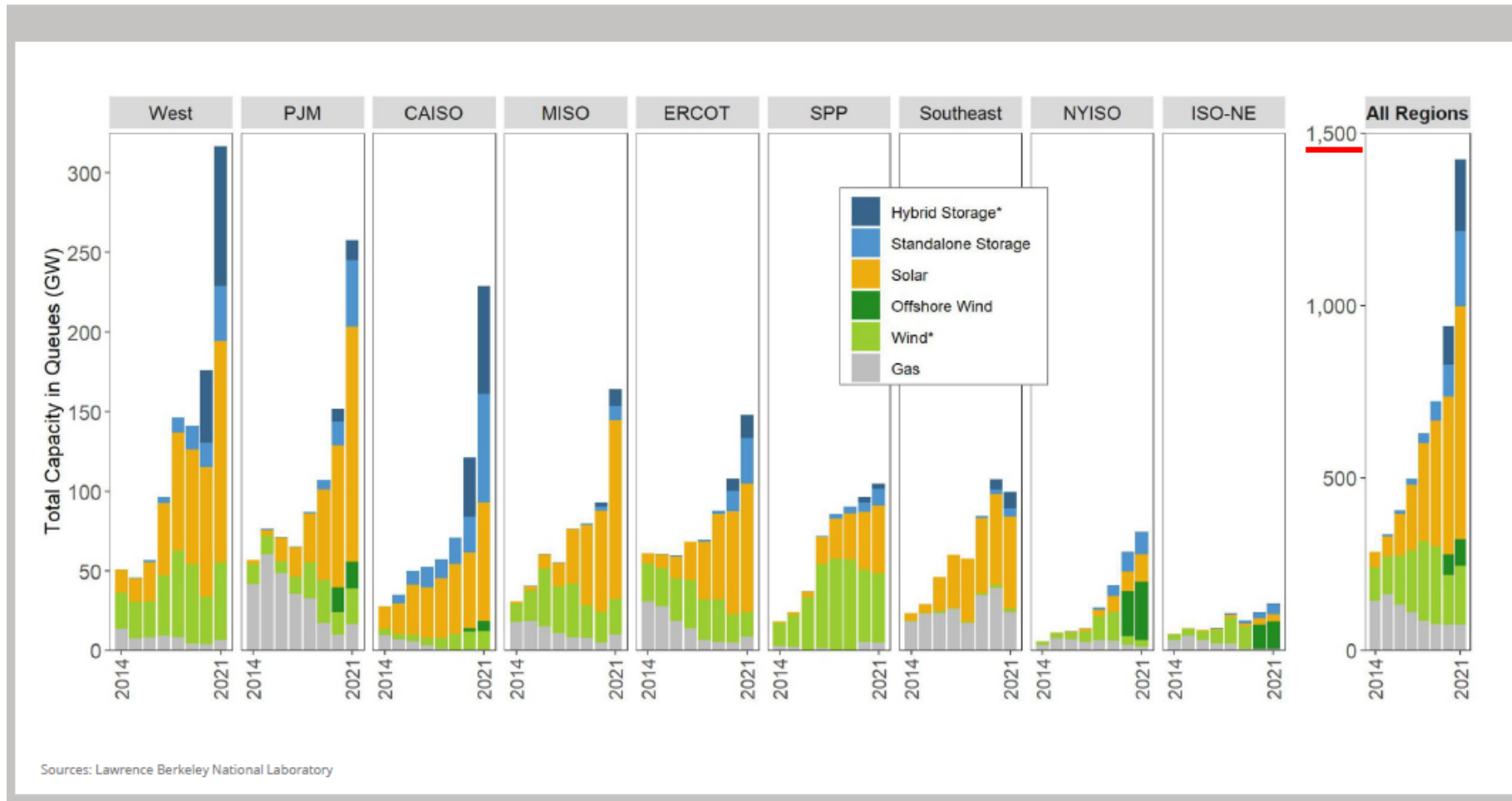


The amount of generation added to the queues in the last three years exceeds the entire U.S. generating capacity!



# Interconnection Scale

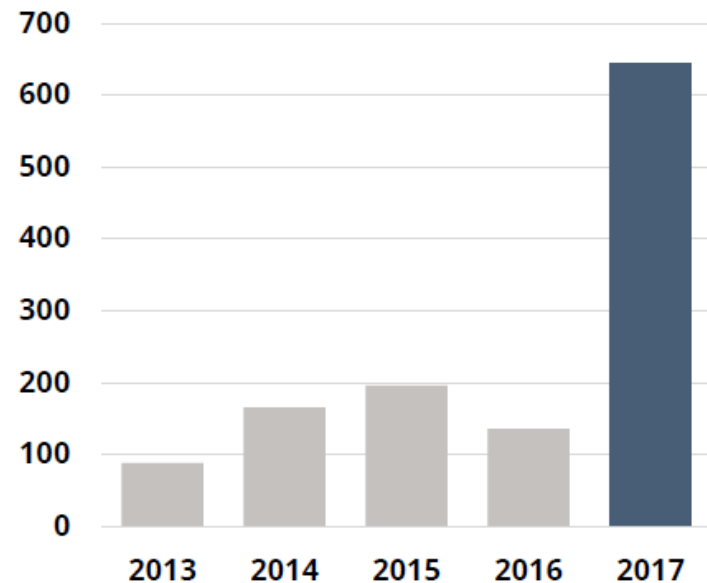
Significant backlog & wait times. Non-viable projects overwhelming the queues mean that market system models cannot be resolved without costly new transmission “backbones”



# Projects Bear the Cost

## SPP GENERATOR

### Interconnection Network Upgrade Costs



**Note:** SPP is behind in processing interconnection queue requests. Latest data is from the SPP Definitive Interconnection System Impact Study (DISIS) for generation interconnection requests received during the DISIS Queue Cluster Window which closed on March 31, 2017, report posted February 2022.

- Historical interconnection cost was <\$100 /kW; at \$1,400 /kW of new wind power project capital costs in SPP – interconnection was <10% of new project capital costs
- At \$644/kW for interconnection costs, new wind project capital costs increase +40% vs. historical levels
  - Interconnection represents more than 30% of total capital costs



# But Transmission is Underutilized

Department of Energy | March 2018

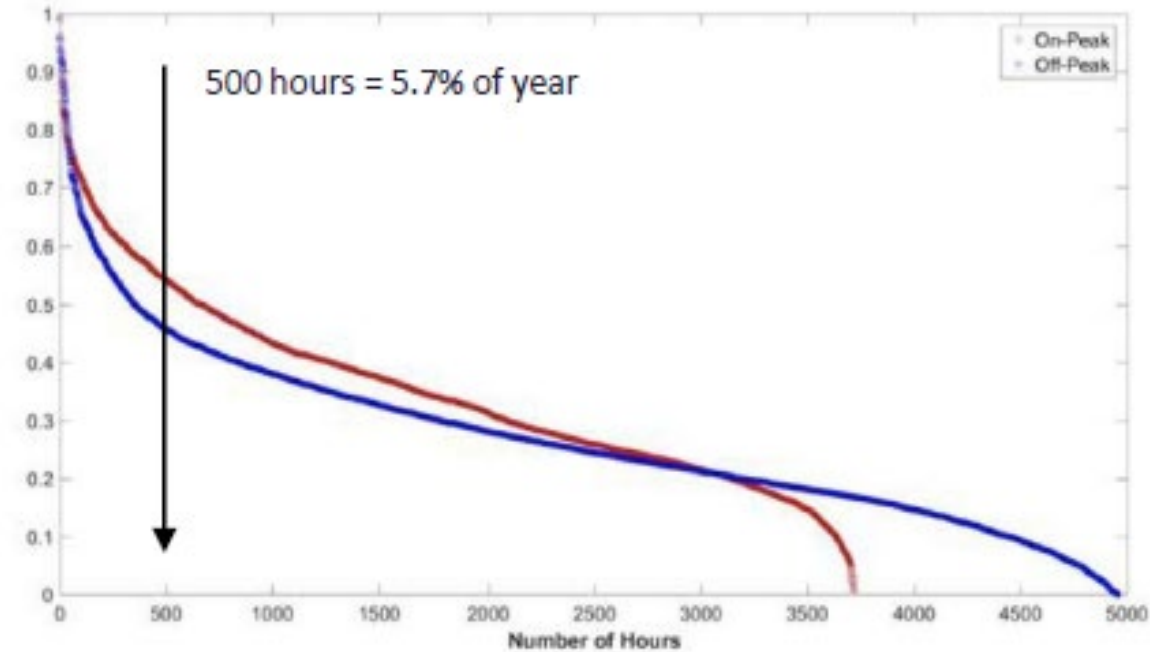


Figure 4-6. Southwest Connecticut import interface duration curve: net flow as a percent of interface limit, 2016

Source: Rojo (2017), p. 32: [https://www.iso-ne.com/static-assets/documents/2017/04/a8\\_2016\\_interface\\_flows\\_and\\_other\\_system\\_performance\\_summaries.pdf](https://www.iso-ne.com/static-assets/documents/2017/04/a8_2016_interface_flows_and_other_system_performance_summaries.pdf)

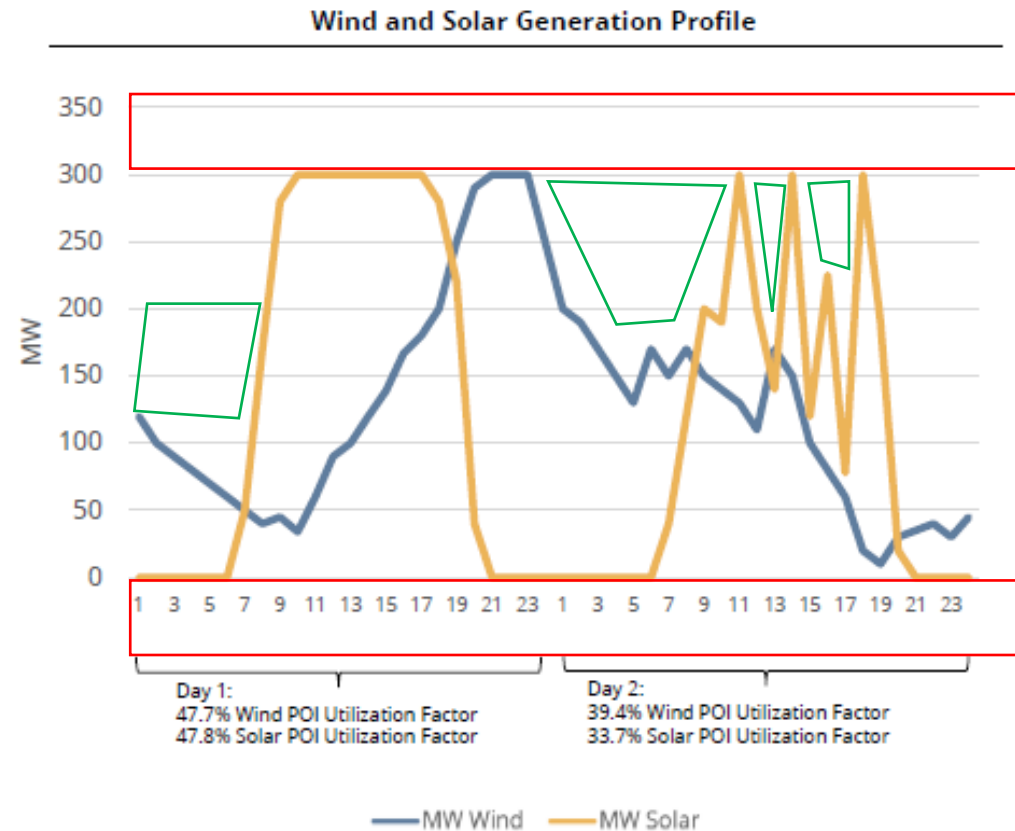


# Storage not Studied Accurately

Green = How storage could charge/discharge to firm hypothetical renewables portfolio without using additional transmission capacity

Red = How storage is studied

Storage is highly incentivized to charge and discharge when those behaviors are most beneficial to the grid. But current study methodologies dictate that we are studied in the most harmful way





# Solutions?

Study storage in a more realistic dispatch scenario

Utilize operating restrictions enabled by hardware/software to enforce limits

SATA

Interconnection process reform - simplify

More resources to TOs and ISOs



