



# The oversized role of transmission in renewable integration and national security

June 2023

*Changing the World's Energy Future*

Emma Mary Stewart



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**June 2023**

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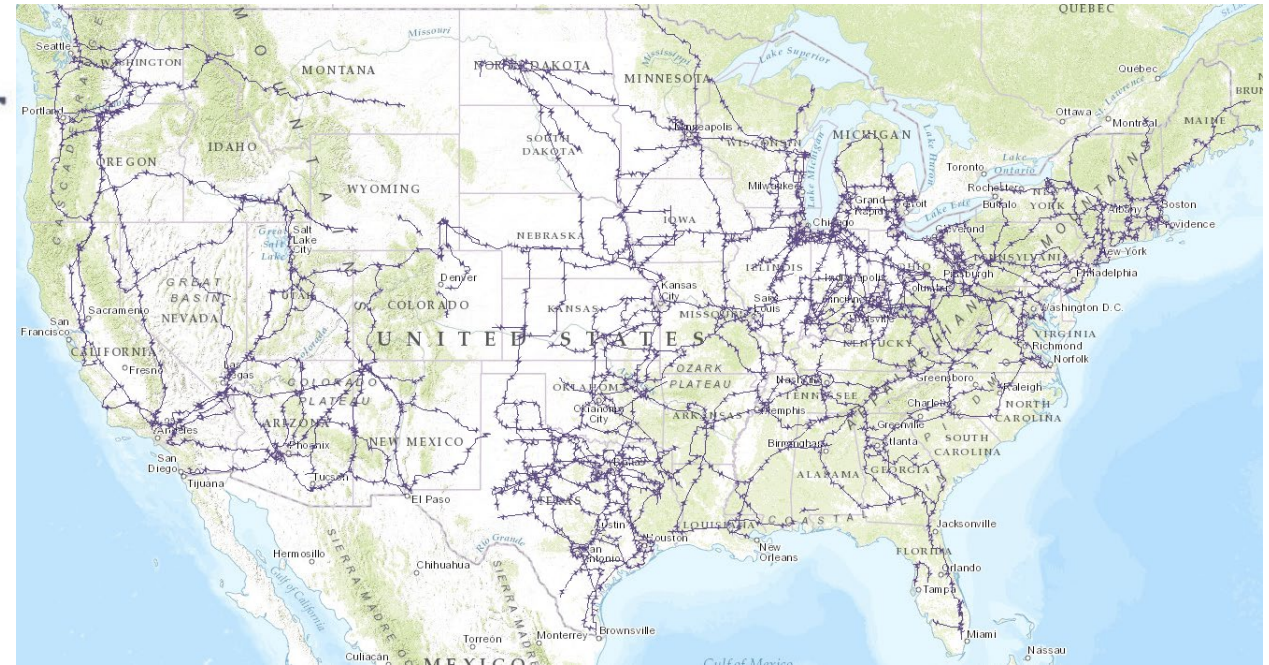
# **The oversized role of transmission in renewable integration and national security**

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# The grid of grids



# Growing Needs & Challenges

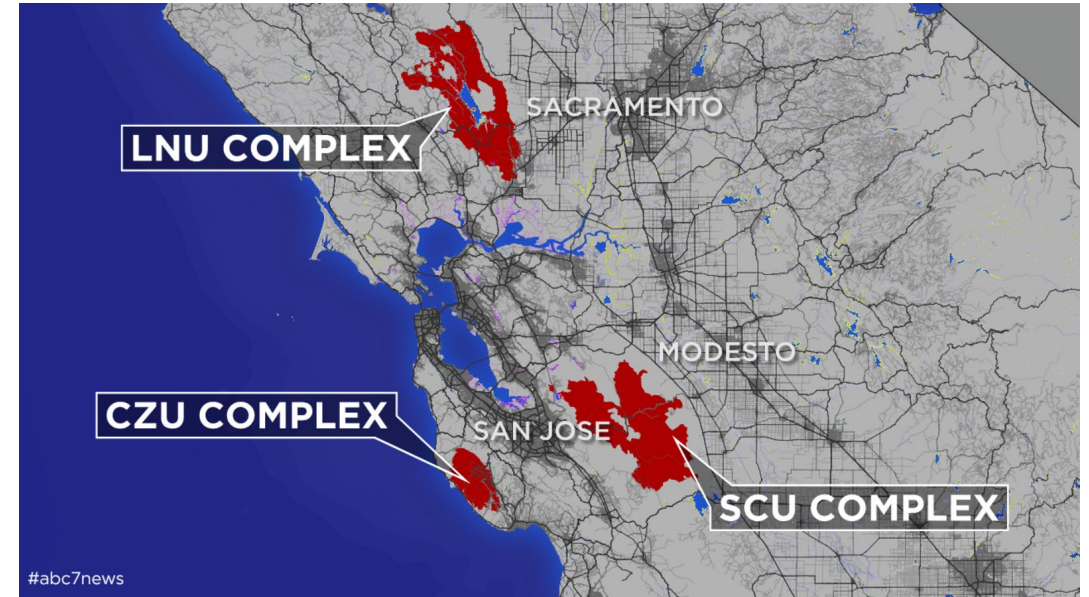
- We need more transmission in the US
  - Evolving generation needs, load makeup
  - Climate change, lack of investment in proactive improvement, compounded by a challenging permit environment
- Repair our environment
  - Last chance saloon on repairing damage with the resources
- Withstanding a changing climate & maintaining quality of life
- It is a national security issue



# Everything at once: Summer 2020



- Its 100F, CAISO calls rolling blackout
- Waste water plant fails, fail over wasn't tested
- Fire turns around, heading for city, evacuation orders begin....(in 4 cities simultaneously across the bay area)
- 1 year later...misinformation everywhere... 'we don't want any solutions'



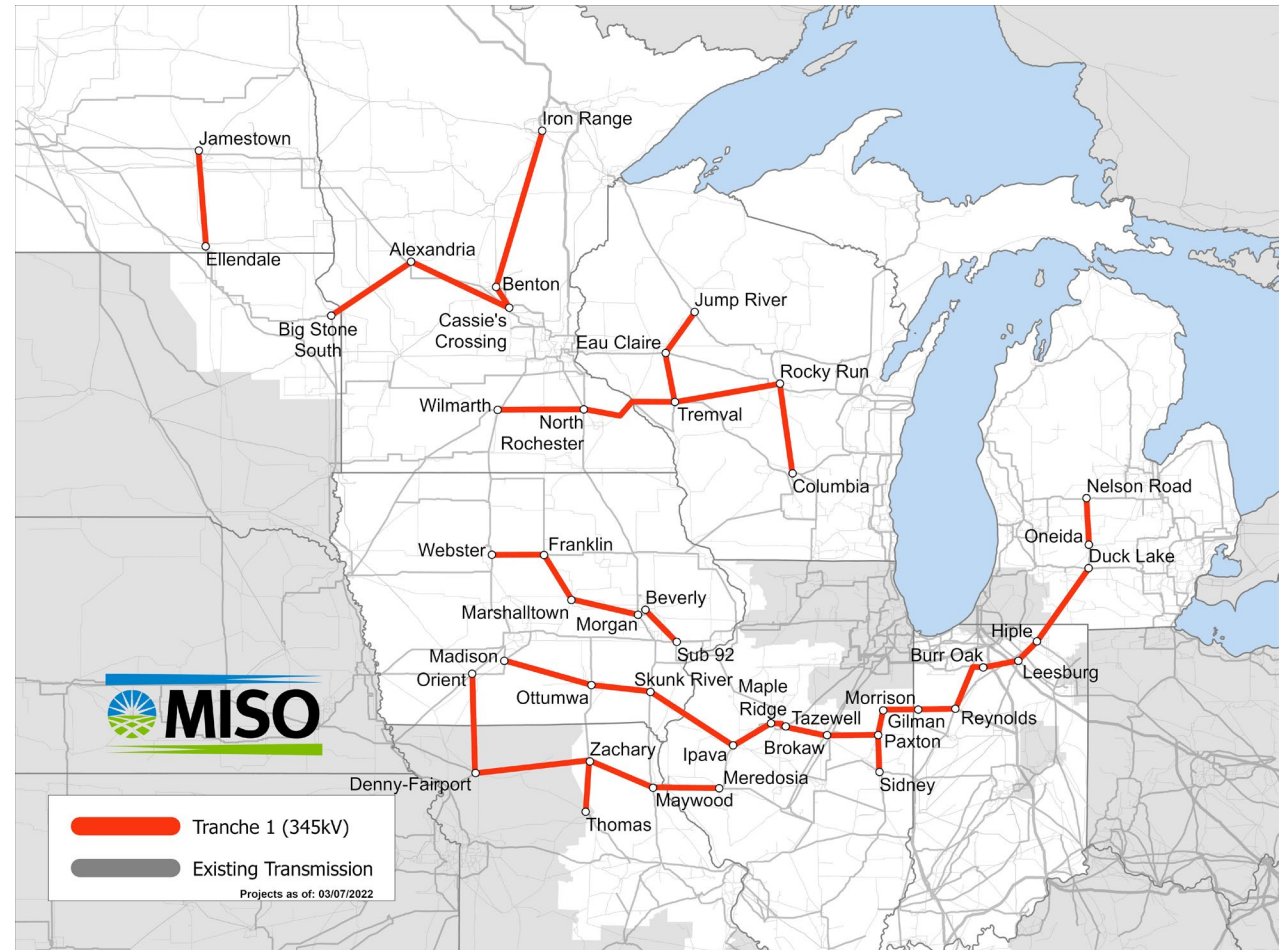
Governor Newsom Announces California Will Phase Out Gasoline-Powered Cars & Drastically Reduce Demand for Fossil Fuel in California's Fight Against Climate Change

Published: Sep 23, 2020

*Executive order directs state to require that, by 2035, all new cars and passenger trucks sold in California be zero-emission vehicles*

# Why is transmission planning hard

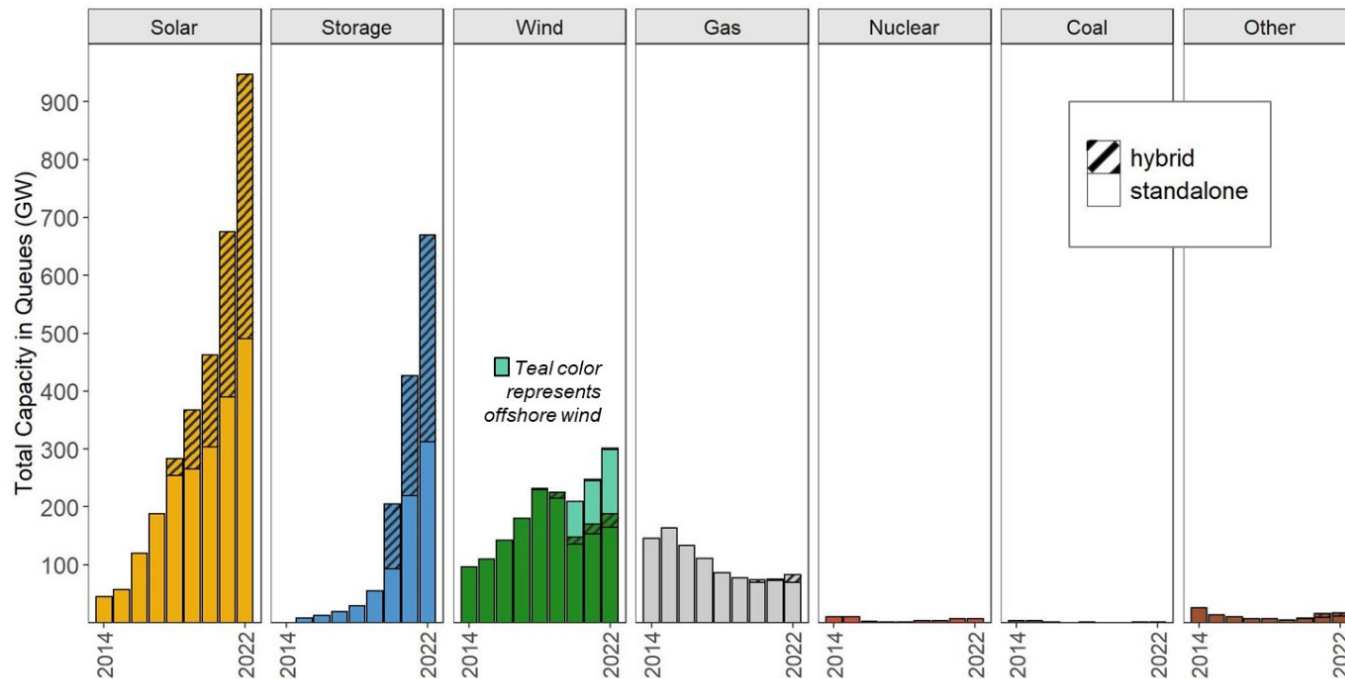
- Many party problem
  - Utility, landowner, BLM, Forestry, Regulatory, owner, operator
  - Supply chain
- Timeline has become infeasible for an agile grid
- Some success, but now try to cross some regions





# If we build it will they come?

- Spoiler: They are already here.. And waiting



Source: Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection As of the End of 2022, Joseph Rand, et al, Lawrence Berkeley National Laboratory  
April 2023

Interconnection Request



Feasibility



System Impact



Facilities Analysis



Interconnection Agreement



Operational

# Interregional transfers – why we need it and whats missing

- **Why an energy security issue**
  - Diversifying the pool of resources available to any one location
  - Diversifying the impacts through improved interregional transfer
  - Equitable distribution of benefits
  - Lowering cost overall – upgrade and optimally plan rather than patch
- **Needs**
  - Data – this is a real time and forecasting problem
  - Integrated operations: T & D & D & T & ISO
  - Security... Cyber Informed Engineering in permitting
  - Motivation & Resource Flexibility



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