

# ISO-Scale Transmission Expansion



**Murali Baggu (NREL)**

NREL PI: Clayton Barrows

LLNL PI: Jean-Paul Watson

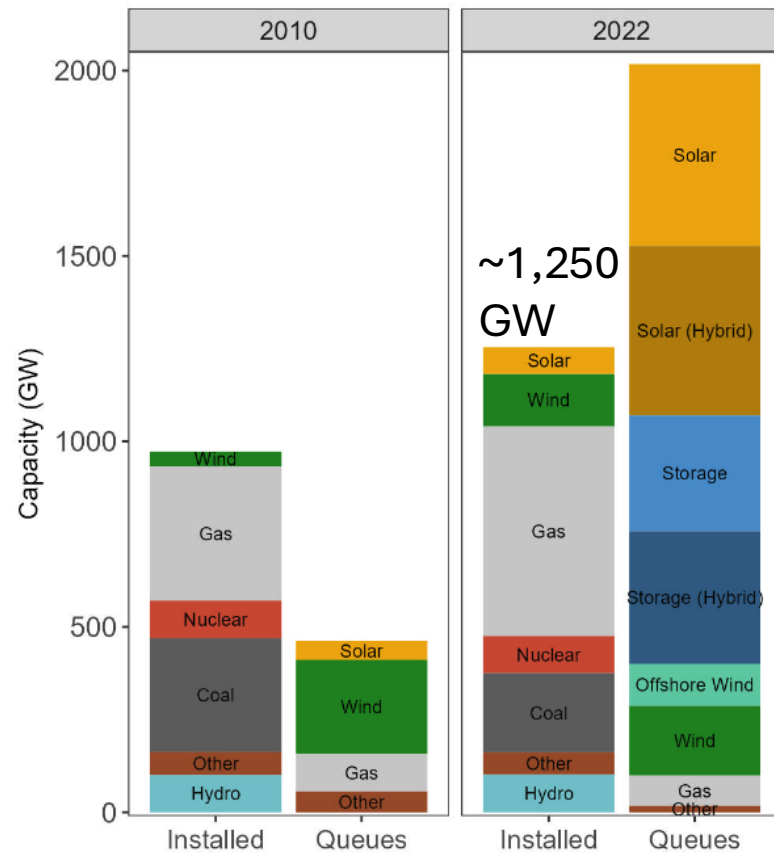


PNNL is operated by Battelle for the U.S. Department of Energy



# State of the U.S. interconnection queue

Entire U.S. Installed Capacity vs. Active Queues



Source: LBNL Queued Up Report [1]

## Interconnection delays and costs are the biggest barrier for utility-scale renewables, say developers

LevelTen and Advanced Energy Economy point to delays in the PJM grid region, in particular. Construction of the 300GW of renewables and storage projects in PJM's interconnection queue would support 1.7 million jobs, says AEE.

FEBRUARY 14, 2022 WILLIAM DRISCOLL

INSTALLATIONS MARKETS & POLICY POLICY UTILITY SCALE PV UNITED STATES



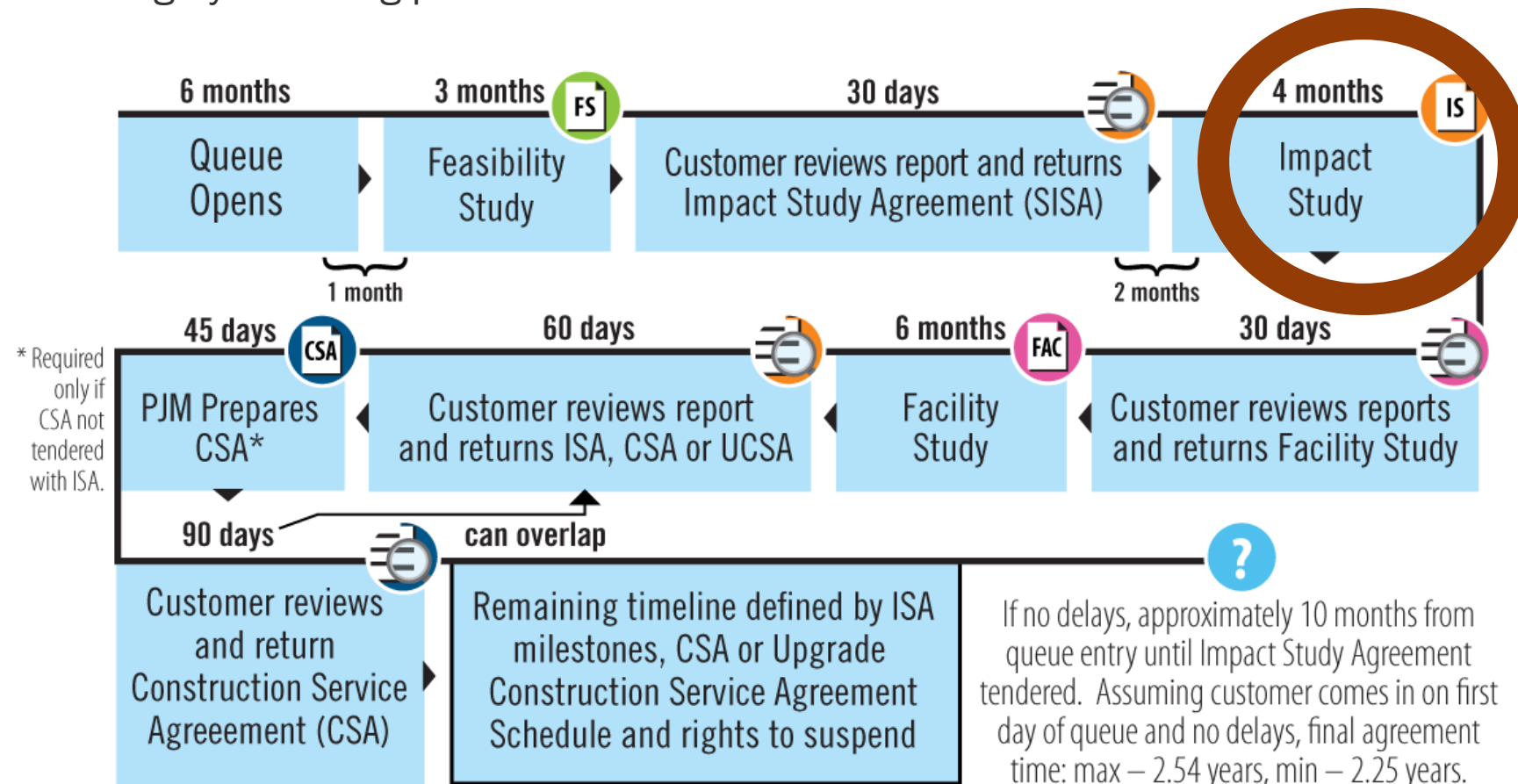
[1] J. Rand et al., "Queued up: Characteristics of power plants seeking transmission interconnection as of the end of 2022," 2023.

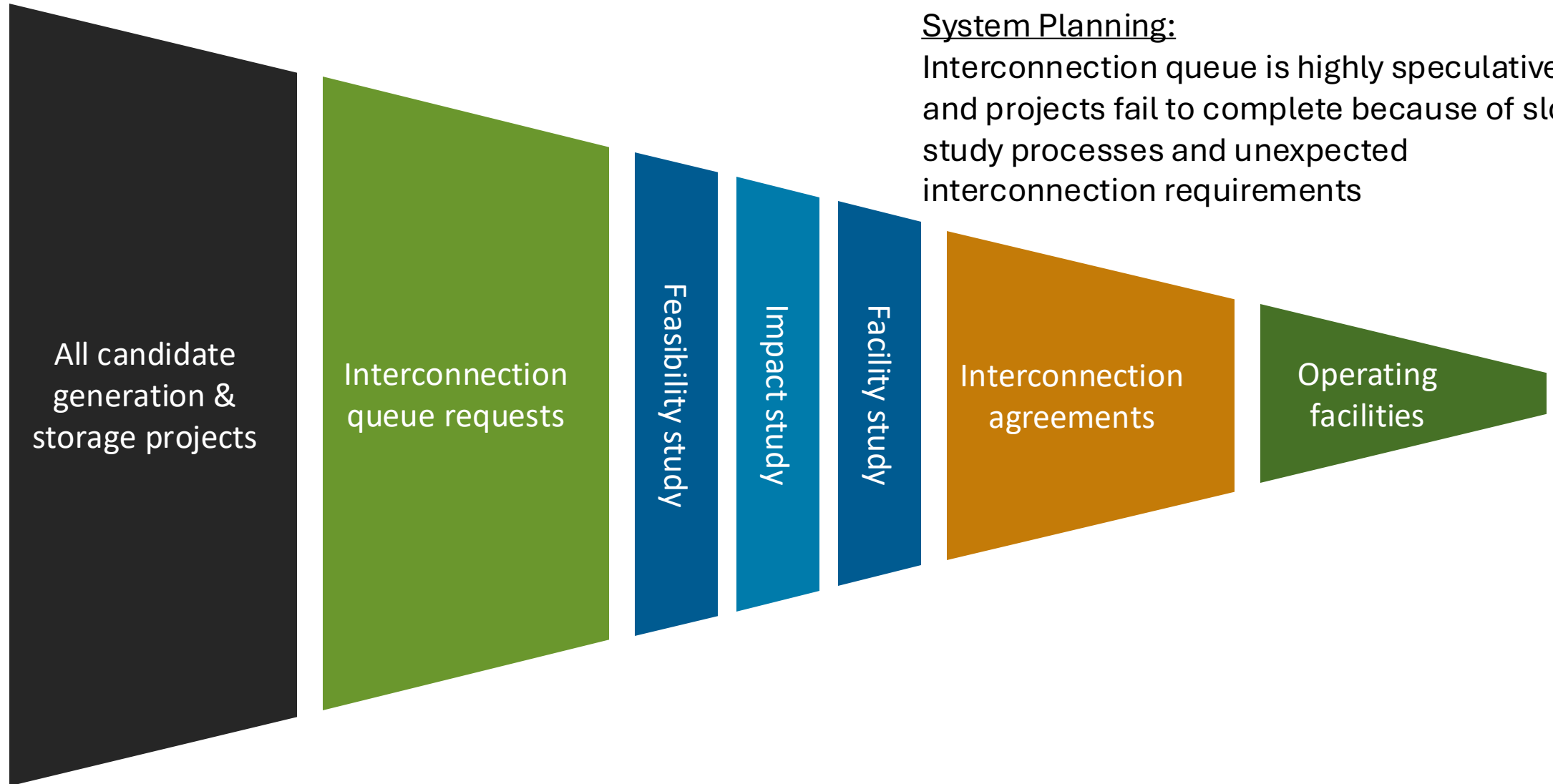
# The interconnection process is broken

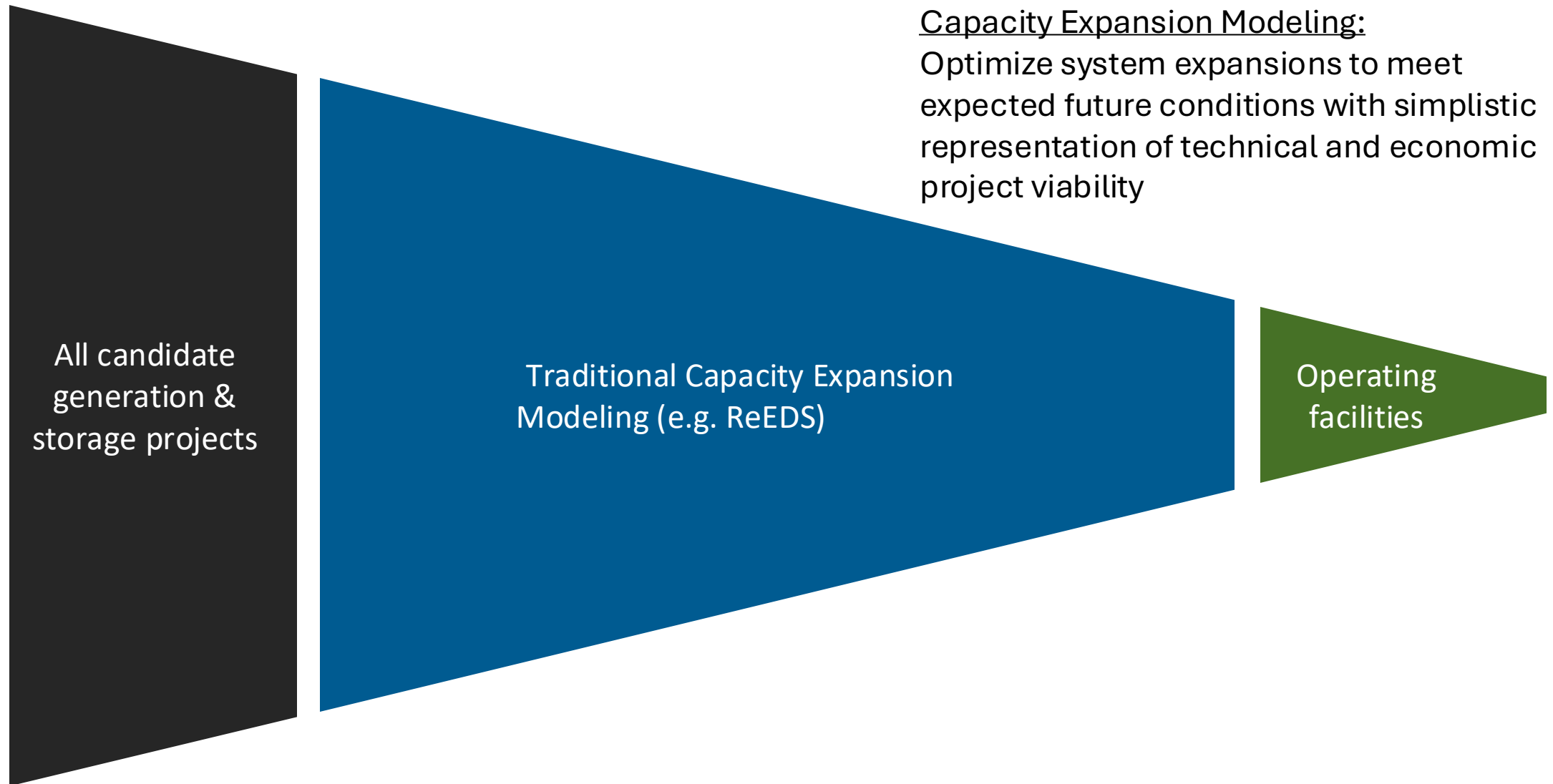
- Queue generation (~2.5 years\*)
- Delays are common based on modeling/engineer availability
- Adjustments require revision of lengthy modeling processes.

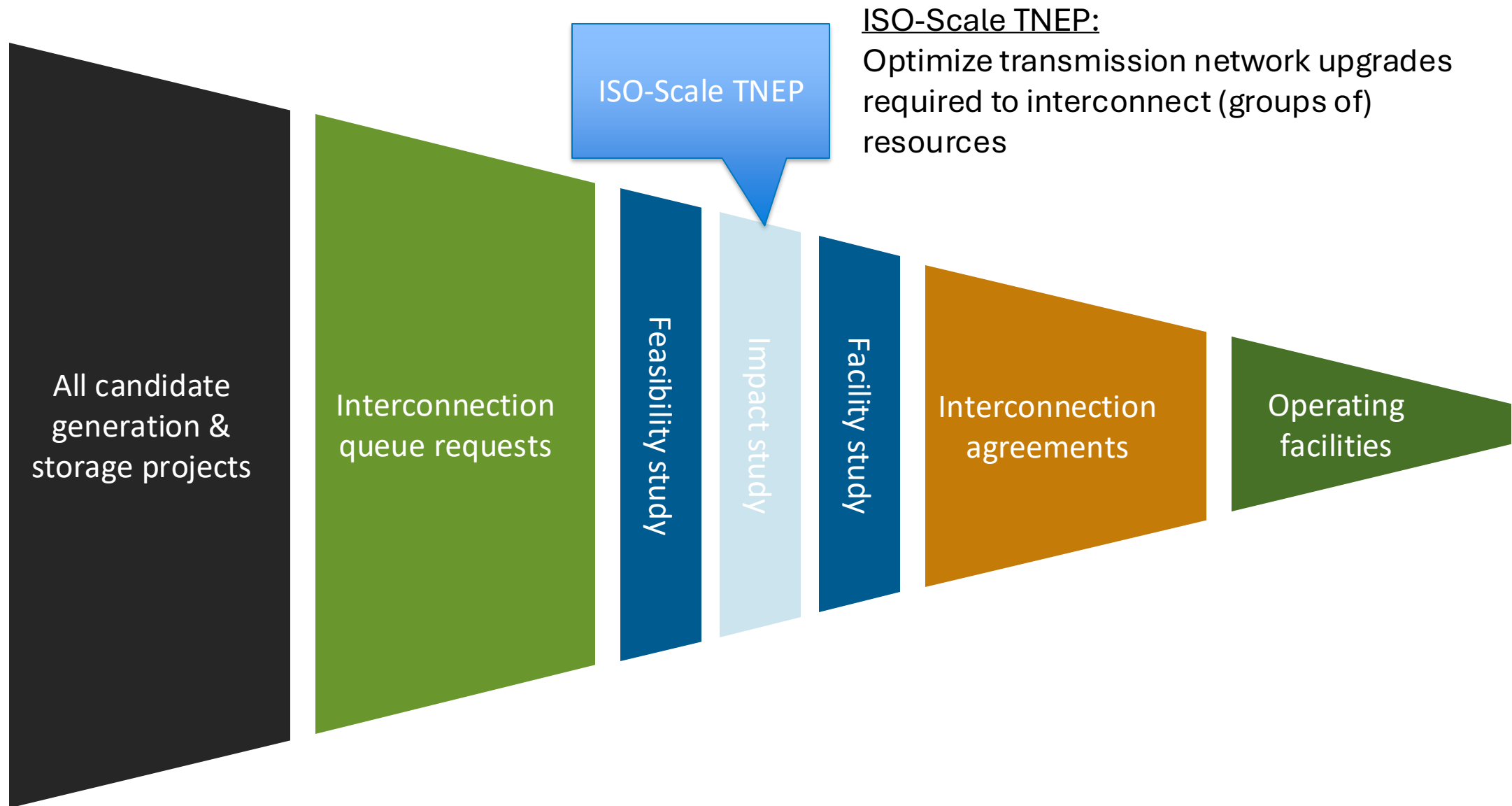
If all goes perfectly:\* 4.5 years  
of "coordinated" G&T approvals

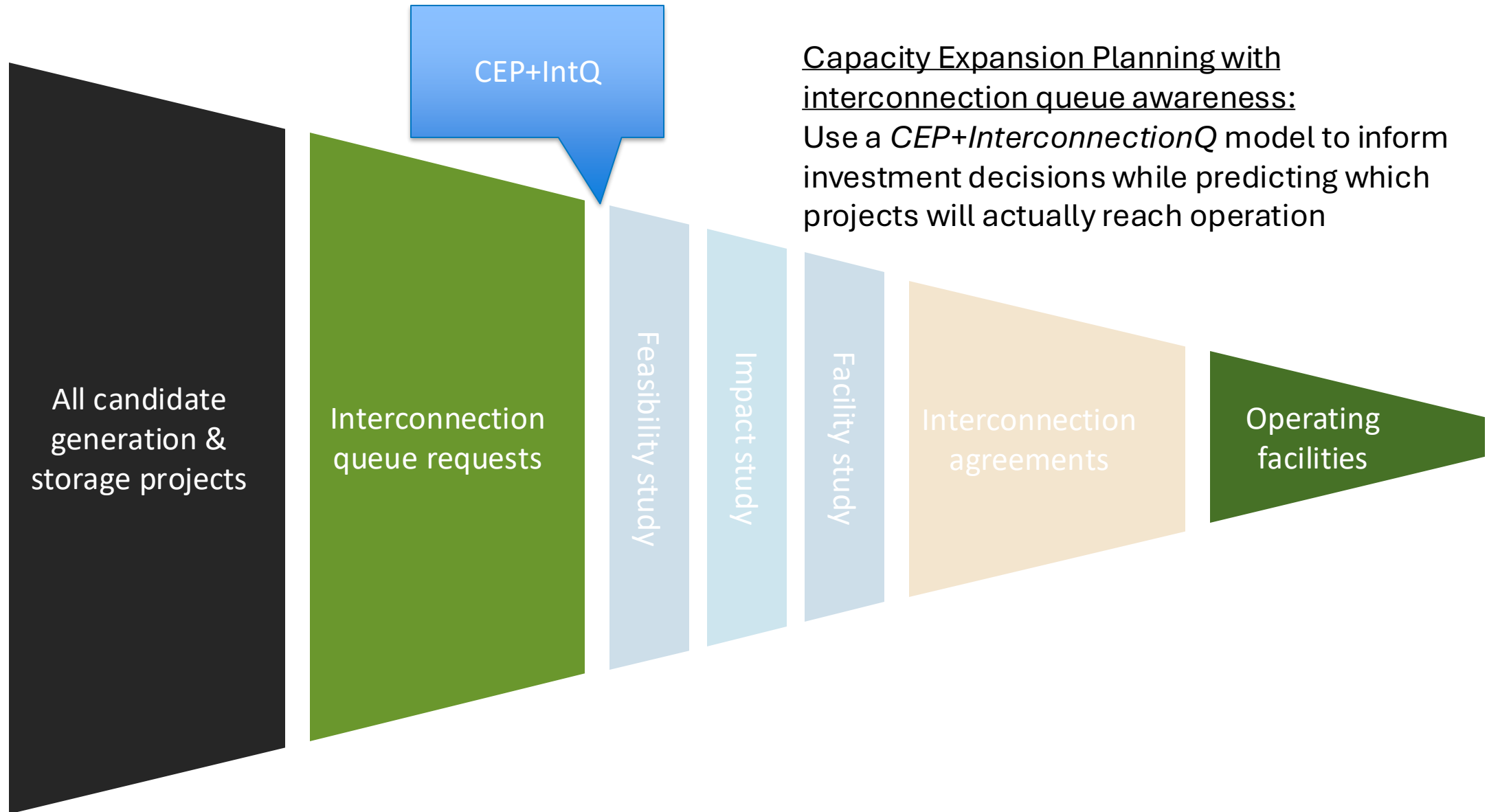
\*This never happens. The reality is this process identifies additional system upgrades and costs that delay or cancel many projects.













# Project Outcomes

- Open-Source Software
  - Transmission Upgrade Screening Tool
  - Sienna\Inv
  - CEP+IntQ
- Journal Publications
  - Novel TNEP solution methods
  - Stochastic expansion planning formulations
  - Applied study results

Innovations and Efficiencies in Generator  
Interconnection

Docket No. AD24-9-000

## NOTICE OF STAFF-LED WORKSHOP

(May 13, 2024)

This panel will assess opportunities for greater efficiency in the processing and study of interconnection requests by automating different steps in the process and using advanced computing technologies, such as artificial intelligence, to shorten the timeline from interconnection request to generator interconnection agreement.<sup>5</sup>







*Transforming* **ENERGY**



**Thank you**



Office of Electricity