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Fundamental challenges of DER valuation

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DER valuation challenges

Non-intrinsic value:

DER value depends on a combination of infrastructure and operational characteristics of the distribution grid:

- the presence of other DERs, utility assets (e, g., lines, switches) and the operational ability of the grid to leverage that value.

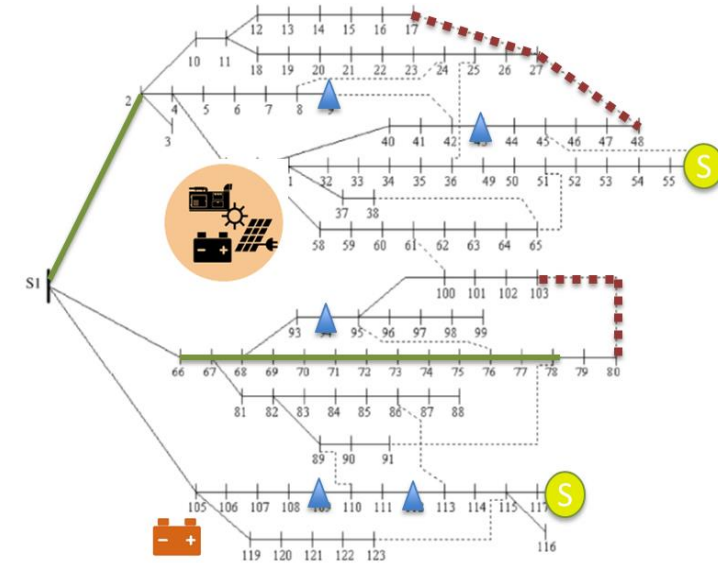
Limitations in concurrent service provision:

The DER operations to maximize certain revenue streams may reduce their ability to provide other values/services.

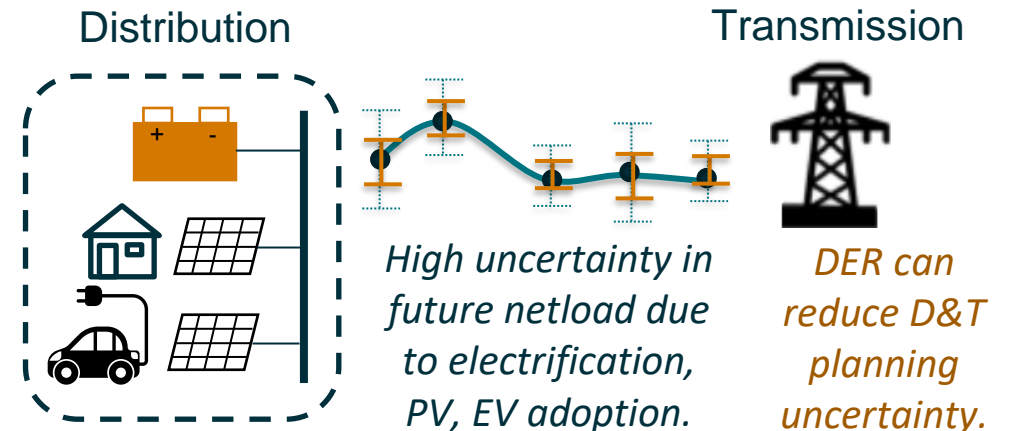
Resilience and risk-mitigation:

Empirical evidence suggests that DERs can reduce the impact of outages. They can also help addressing the long-term uncertainty associated with netload growth.

- How to capture these risk-mitigation values of DERs?

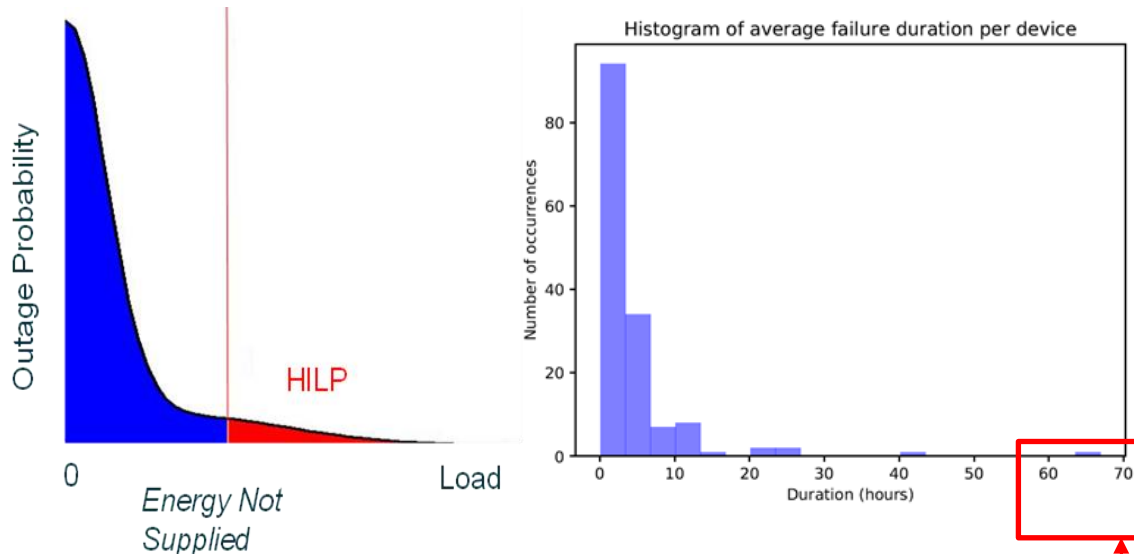


The value of DERs is system-dependent and changes with operation conditions.

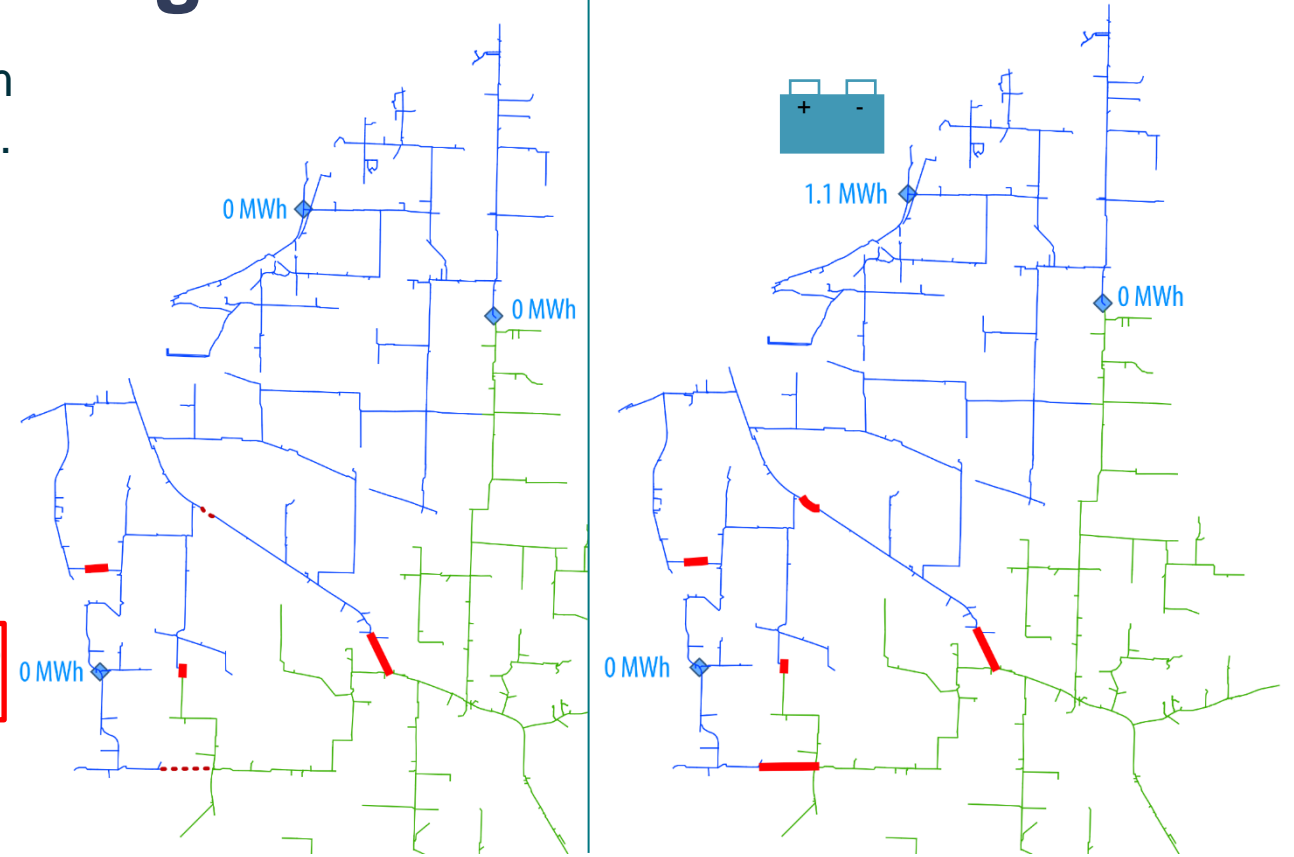


Risk-mitigation value of storage

Valuing DERs in a risk-averse distribution system planning process: ComEd feeder (Chicago area).



Summer storm in August 2020



Risk neutral plan

System Risk Cost (CVaR): \$2.6B

Risk averse plan

System Risk Cost (CVaR): \$ 1.0M



SEVERE WEATHER

ComEd power outage leaves 260K across Chicago area in dark

ComEd says it could take several days to restore power to all customers

A. Moreira, M. Heleno, A. Valenzuela, J. H. Eto, J. Ortega and C. Botero, "A Scalable Approach to Large Scale Risk-Averse Distribution Grid Expansion Planning," in *IEEE Transactions on Power Systems*, doi: 10.1109/TPWRS.2023.3273195.