STORAGE AND RESILIENCE

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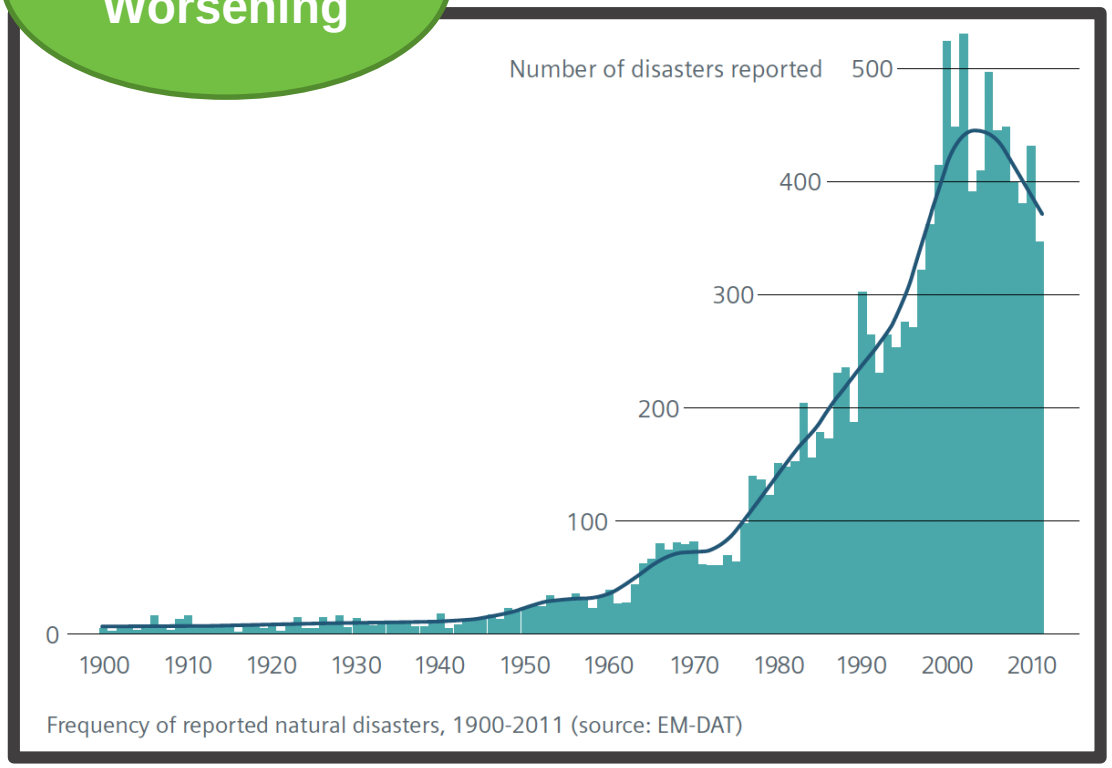
Why is Resilience Important to the Future of Renewables?

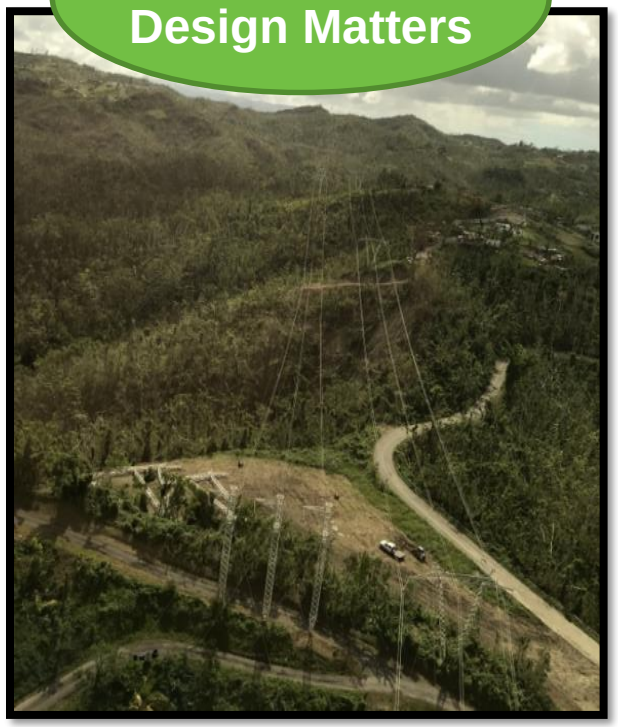
Climate Events Worsening



Frequency of reported natural disasters, 1900-2011 (source: EM-DAT)

Siting Matters

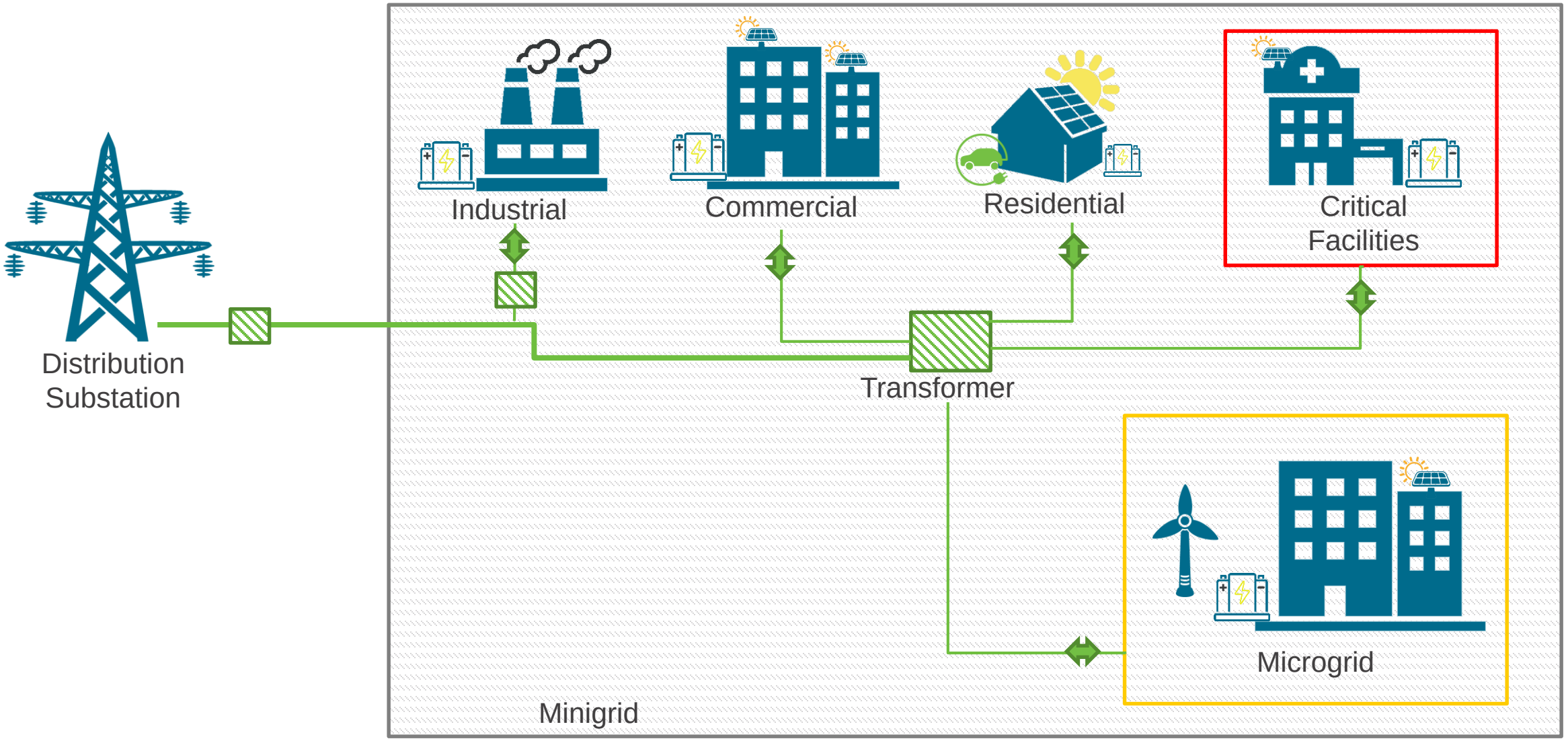
Transmission Design Matters



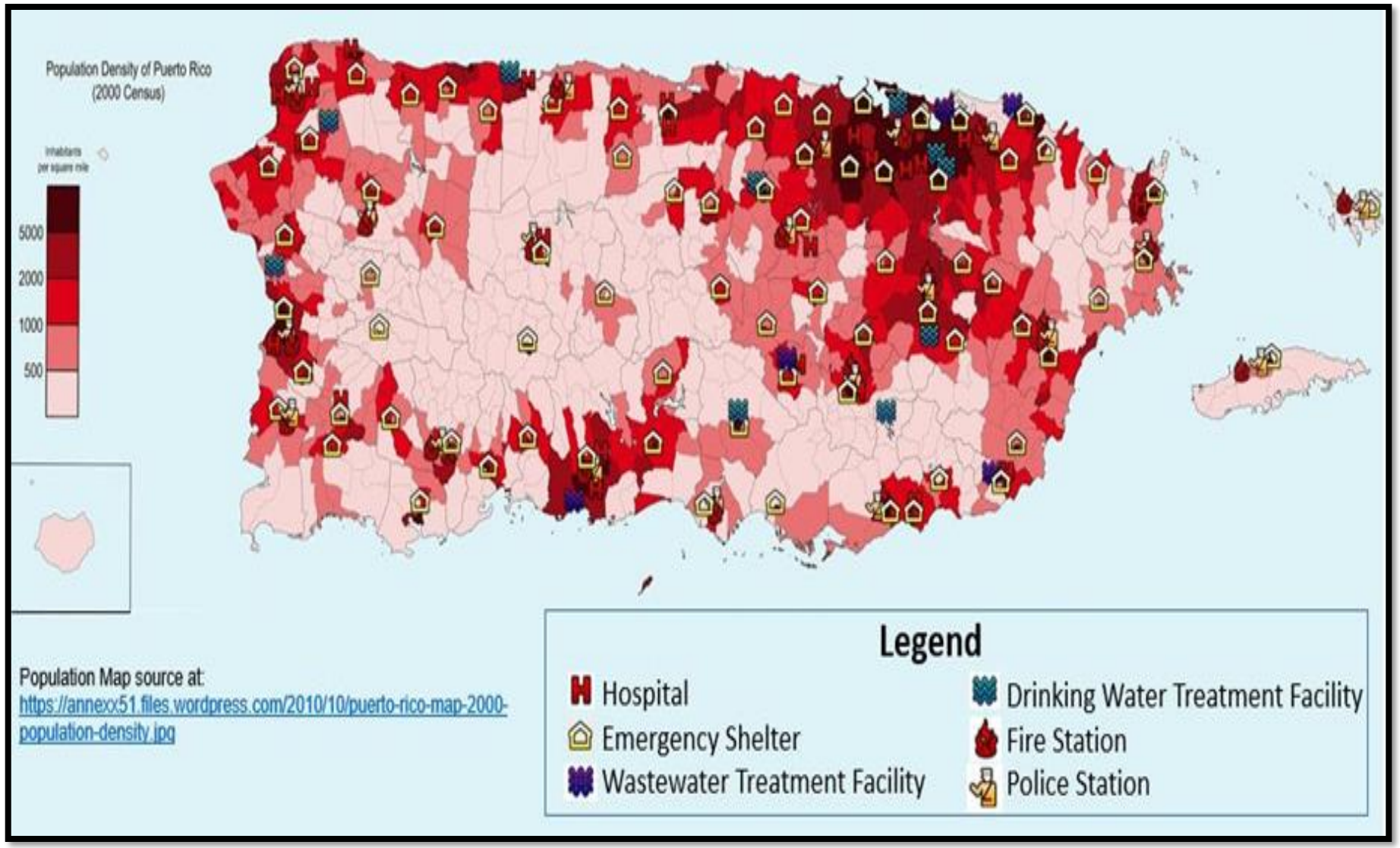
How Can Renewables Improve Resilience?

- Local, not dependent on ports
- Siting and hardening
- Transmission architecture matters
- Distributed with grid modernization
- Electrification of transportation

System Architecture Matters



Microgrids for Critical Infrastructure



Where Do We Go From Here?

- **Explicit quantification** of the costs and value of resilience
- **Co-optimization** with traditional planning reliability and cost criteria
- **Careful siting** of renewables with expectation of climate disruption
- **Hardening** of solar installation to withstand hurricanes
- **Cellular approach** to grid modernization with distributed resources / microgrid as the default architecture