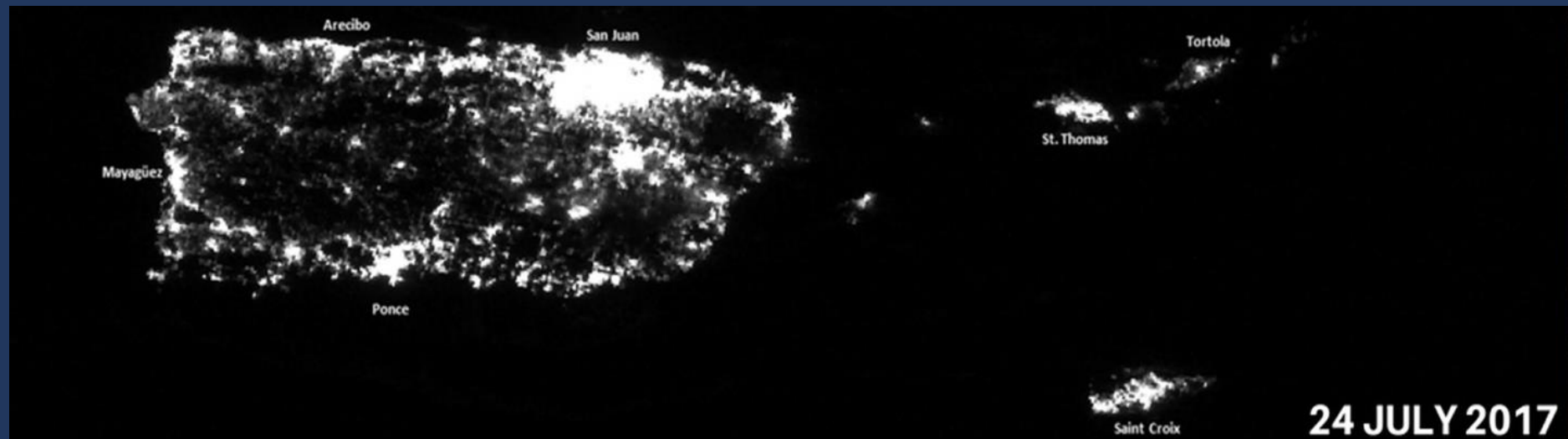


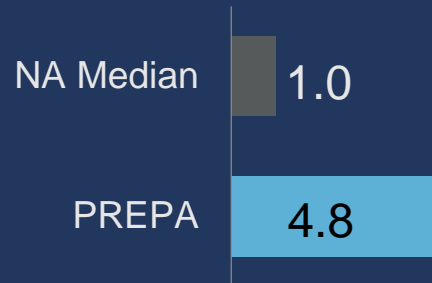
Microgrids Policy:
Forbidden Journey,
Wizarding World, or Islands of
Adventure?



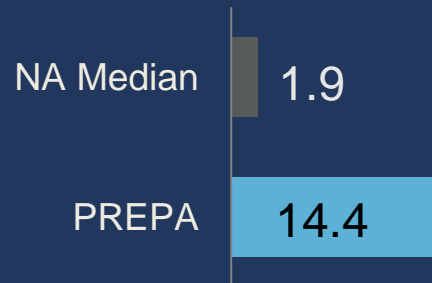
The Puerto Rican power system was struggling before the storms

Poor reliability

SAIFI, FY17

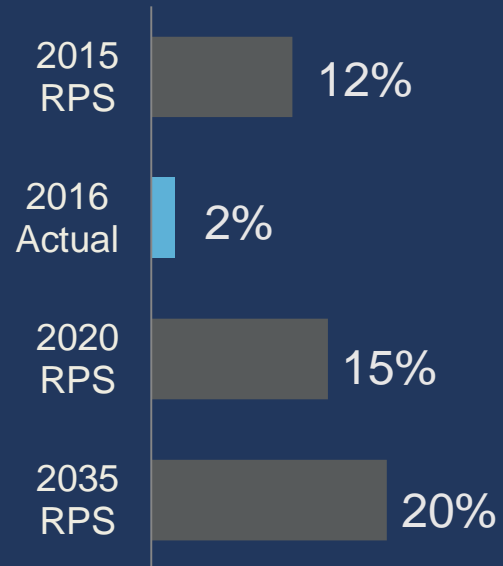


SAIDI, FY17



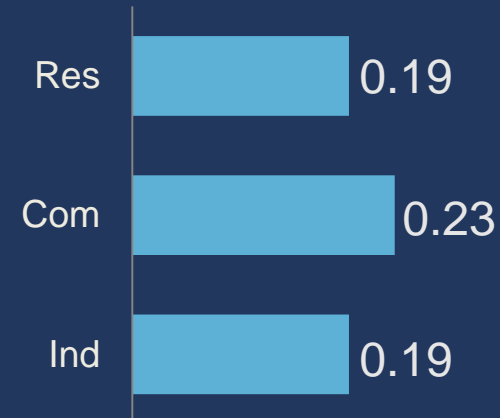
Minimal renewables

RE generation (%)



Expensive energy

Average rates (\$ / kWh)



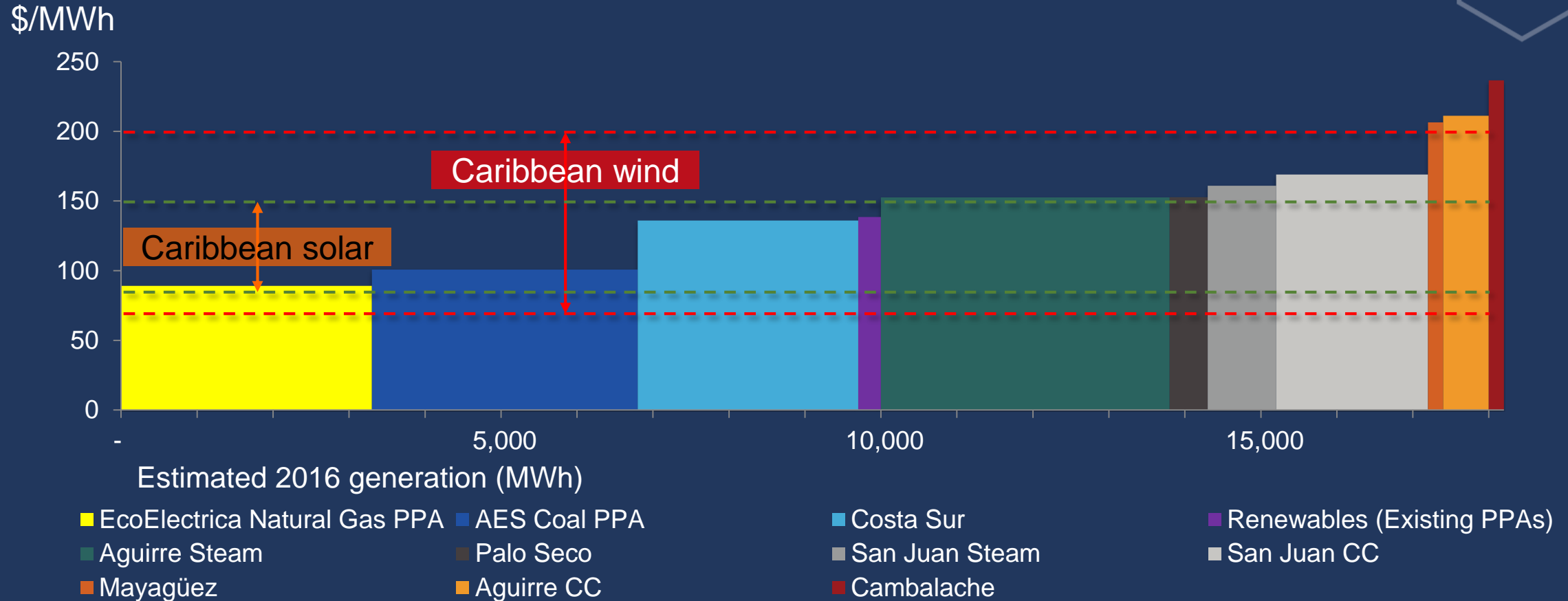
Debt burden

\$11.4 B

Total PREPA liabilities

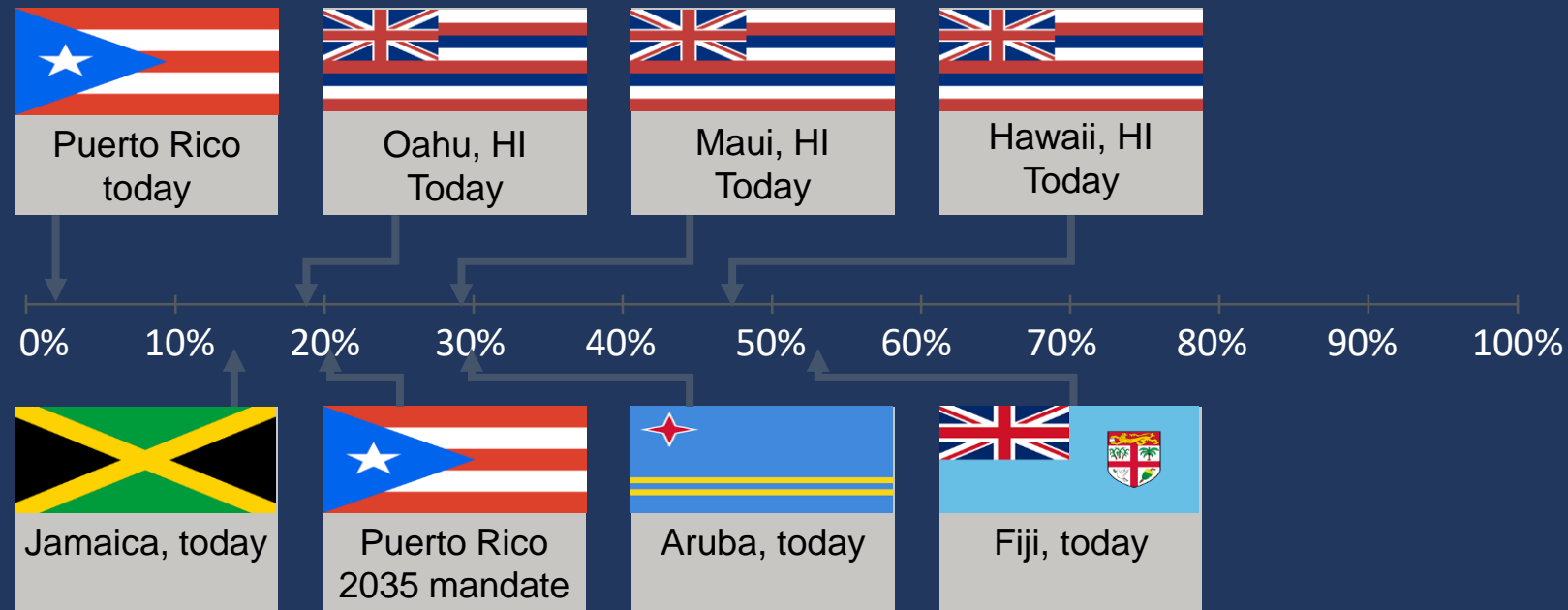
Renewable energy is cost-effective for Puerto Rico

Operating cost of existing power generation in Puerto Rico, \$/MWh



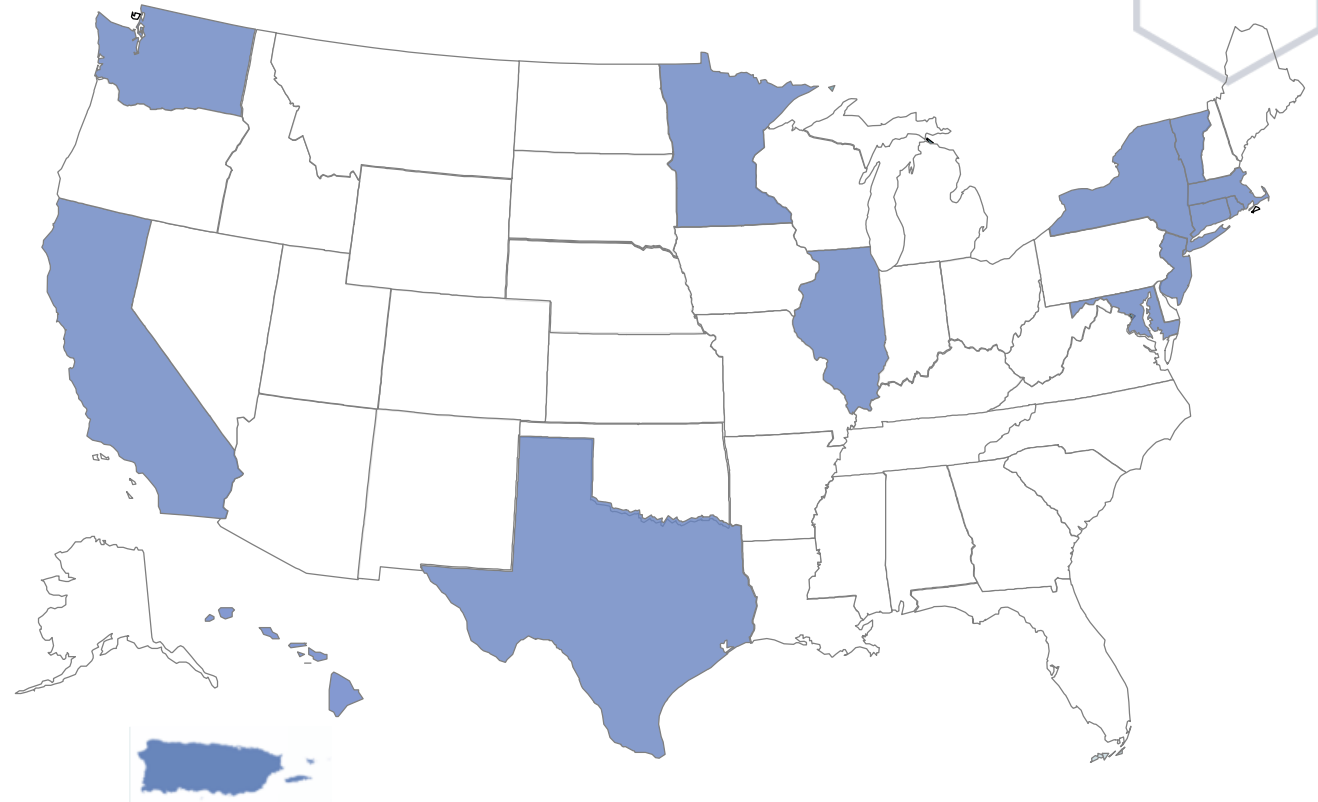
Island systems are already operating at much higher renewable penetrations than Puerto Rico

Current and potential renewable energy penetration rates without loss to reliability



Motivations for microgrids vary by region, customer, and utility

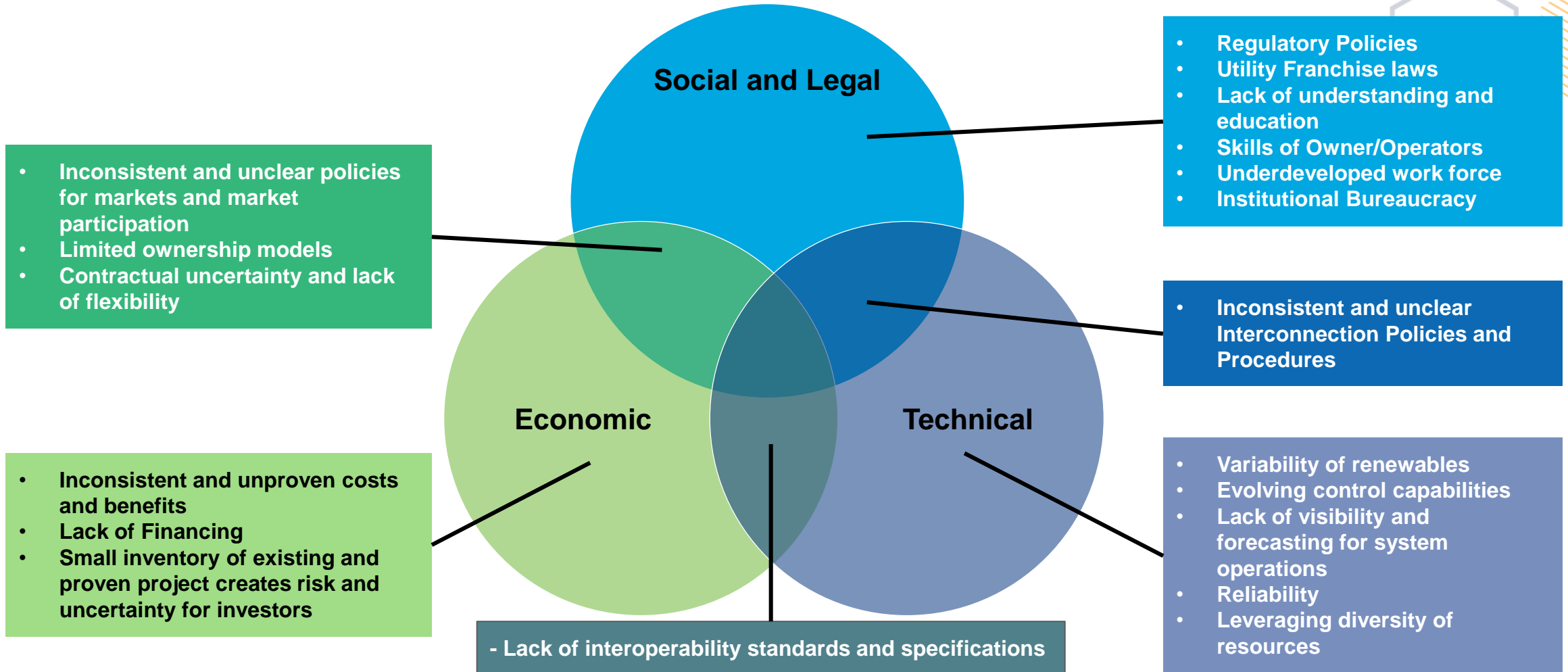
- Establish island-able shelters and critical loads during emergencies
- Reduce costs
- Integrate more DERs
- Provide grid services
- Catalyze experimentation and learning
- Economic development
- Respond to community and customer needs
- Decentralization
- Security
- Erosion of “natural” utility monopoly



■ States with microgrid policies or programs

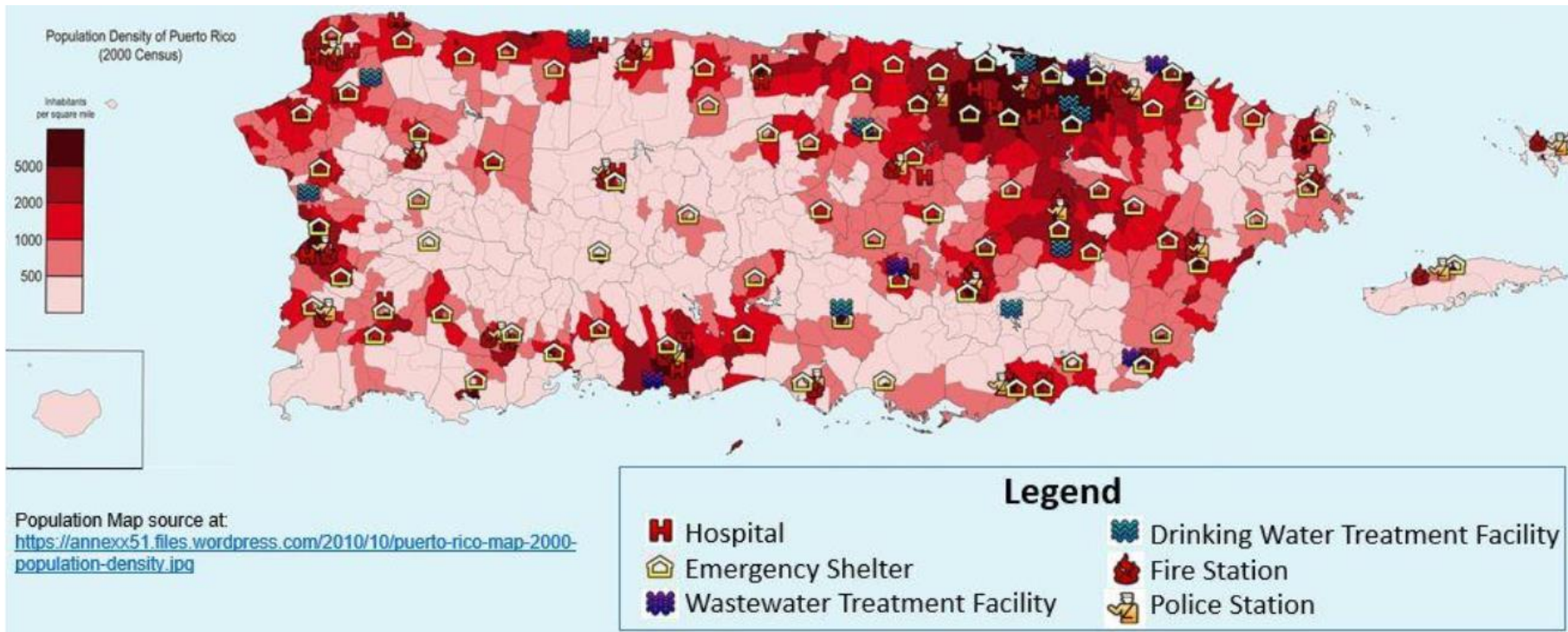
Source: Converge Strategies,
NREL / MassCEC (2018)

The 'answers' are not easy or obvious



Microgrids can cost-effectively improve resilience

Hypothetical islanding of critical infrastructure (NYPA)



Costs may be less than storm-hardening remote communities and carry additional benefits:

- Minimized lost economic activity during outage
- Minimized land use and transmission requirements for central generation
- Deferred or reduced need for new plants
- Reduced dependence on imported fossil fuels

What's next?

Navigating partnerships and roles	Translating value into \$	Distinguish the “what” from the “why”
<ul style="list-style-type: none">• Have you talked to the utility?• 3rd Parties – who’s going to build this thing anyway?• Do customers actually want it? If so, what do they want?	<ul style="list-style-type: none">• Energy efficiency first• Putting a price tag on resilience, power quality, insurance, etc.• What’s in the public good? Private good? What does that imply for cost allocation?	<ul style="list-style-type: none">• Expanding our thinking from microgrid pilots to microgrids at scale• Do you really need a microgrid?• Focus on services and value, not technologies

Microgrids Policy:
Forbidden Journey,
Wizarding World, or Islands of
Adventure?

*Please complete the session survey
in the meeting app*

Session A4

Look under the “polls” button