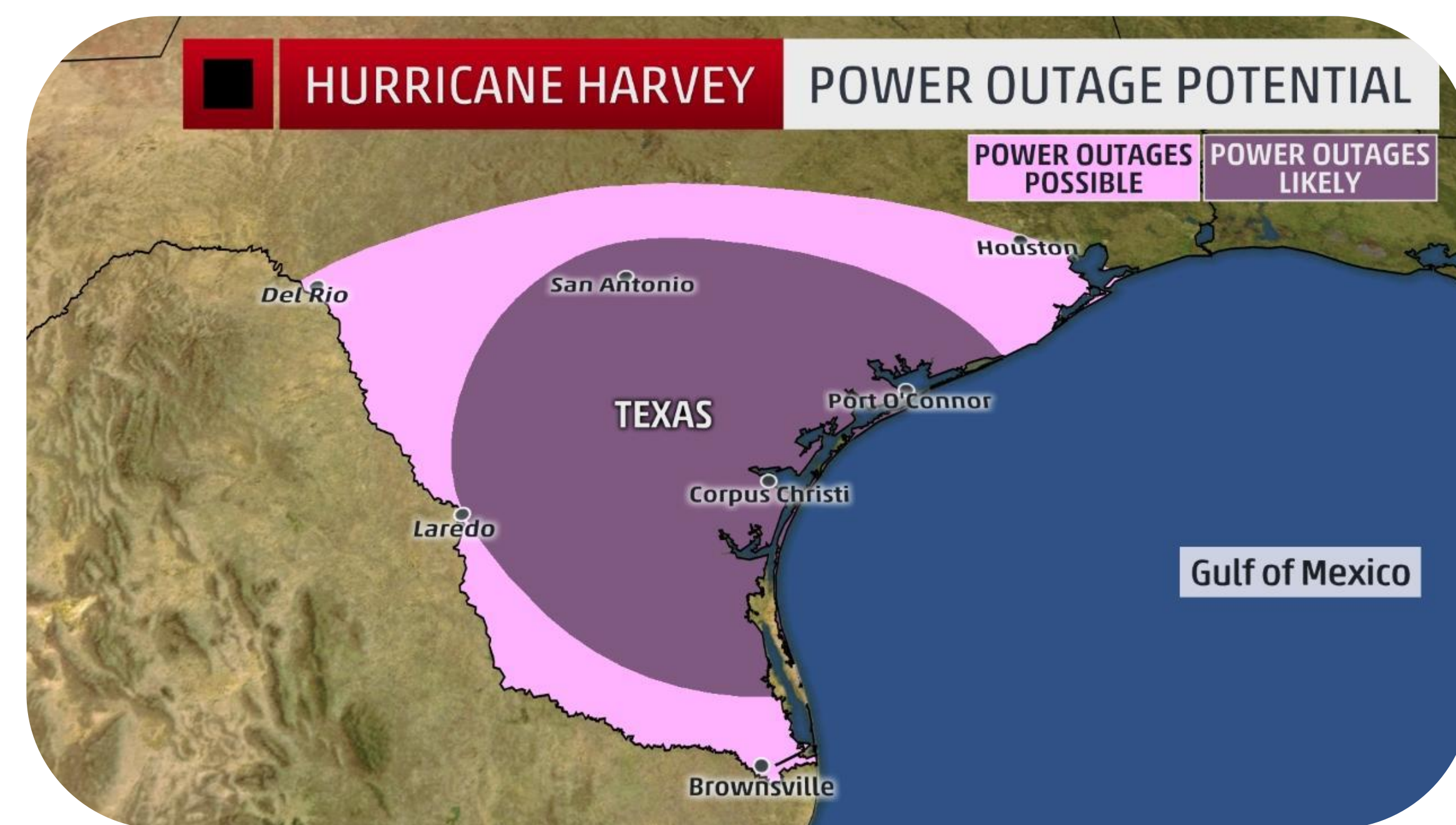


Disaster Management of Power System Restoration

Toward a Resilient Smart Grid
Saeedeh Abbasi, Masoud Barati, and Gino J. Lim

Problem Description

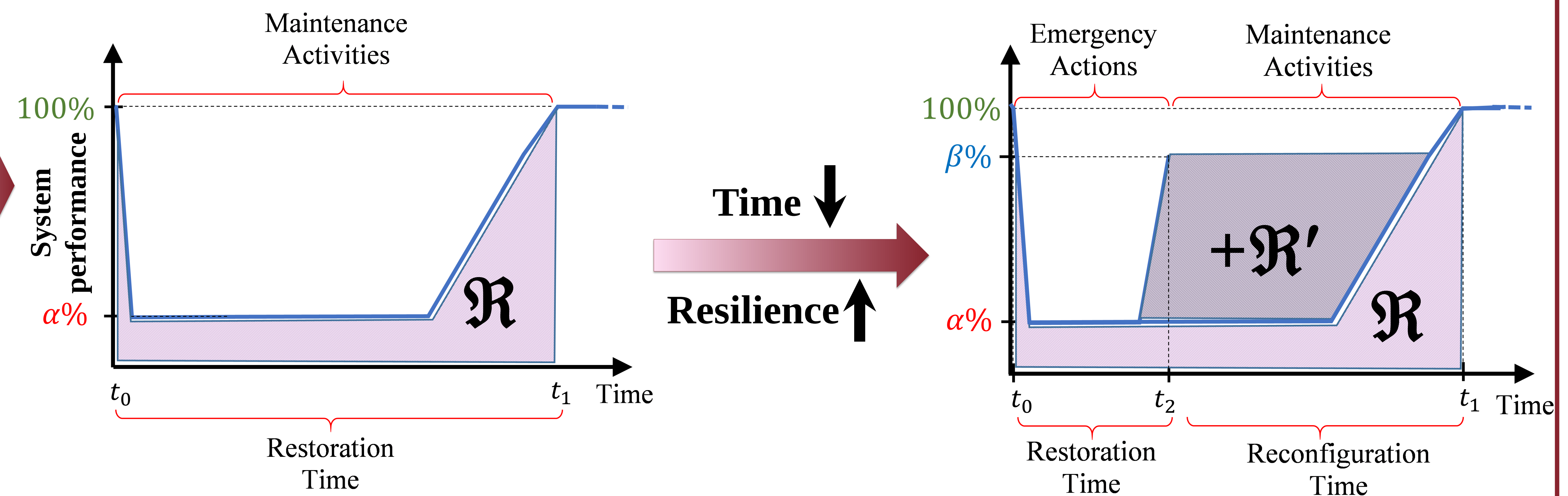
- ⚡ Power outage is expected following a disaster like a hurricane.
- ⚡ It is desired to have the power back ASAP.
- ⚡ So, an exact plan is required for a quick power restoration.



Source: Houston Chronicle, August 2017

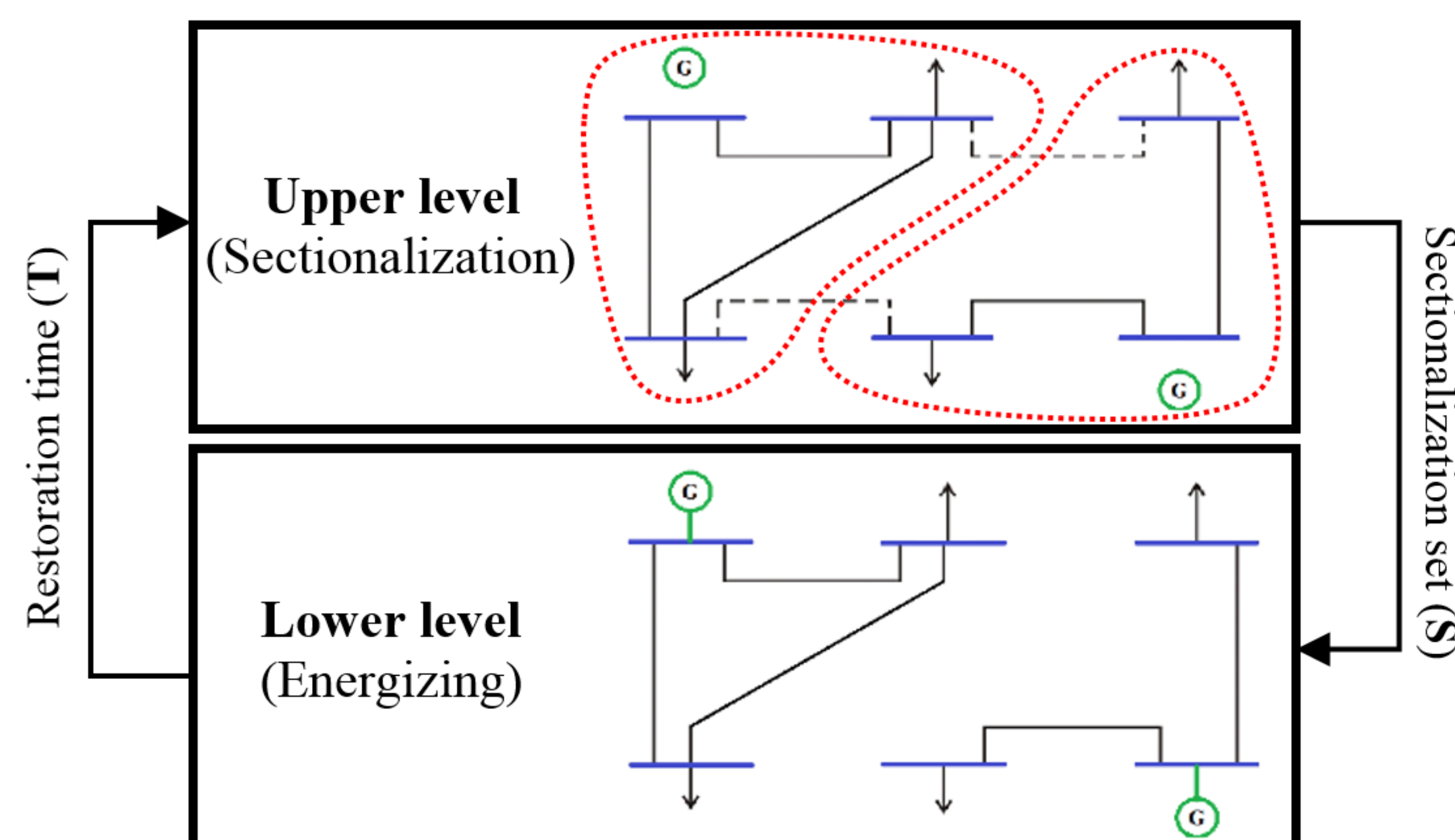
Resilient System

- ⚡ A resilient power system can withstand a disruptive event or be recovered quickly.
- ⚡ A system's resilience can be described through its performance-level over the time.



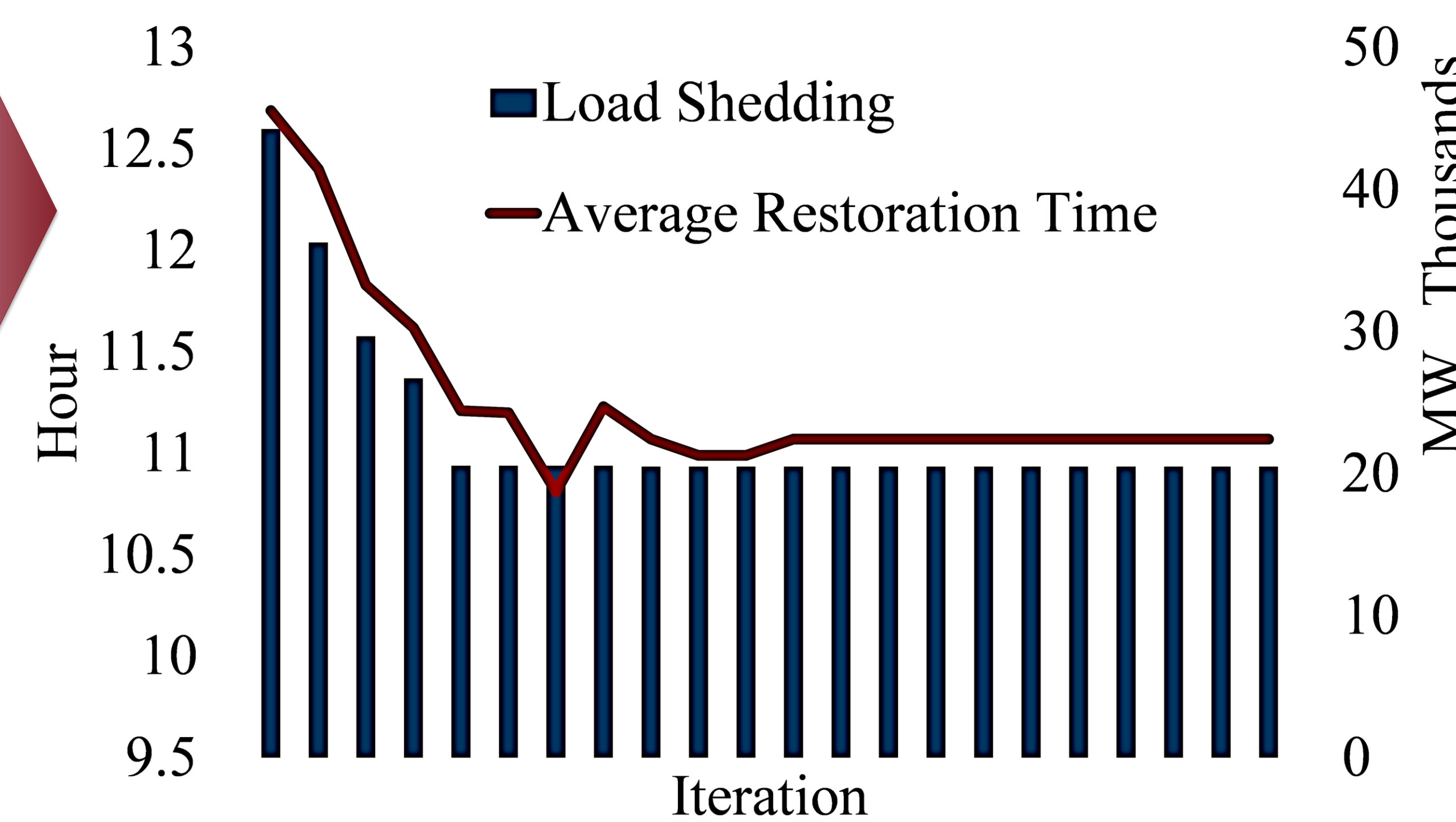
Solution Methodologies

- ⚡ A multi-objective model is formulated to plan for a parallel restoration.
- ⚡ An iterative optimization algorithm is introduced to solve the proposed model.



Results

- ⚡ Power is restored in about 11 hours while it usually takes more than a day.
- ⚡ Above 90% of the demands is supplied.



Restoration of a disrupted a IEEE 118-bus test system

Conclusion

- ⚡ A de-energized power system is recovered, targeting the maximum resiliency.
- ⚡ An optimal network-based sectionalization is provided, penetrating one black-start generator per region.

