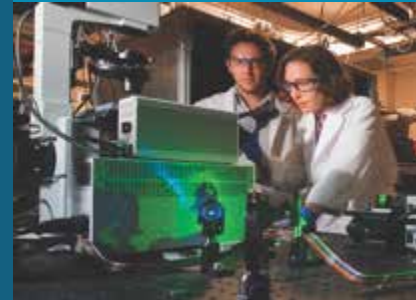


The 2018 Grid of the Future Workshop



PRESENTED BY

Dr. Carol Adkins, Director, Energy, Earth and Complex
Systems



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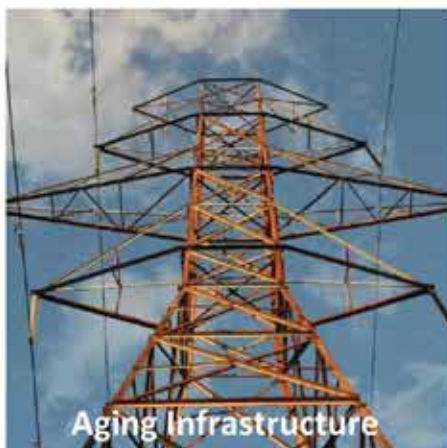
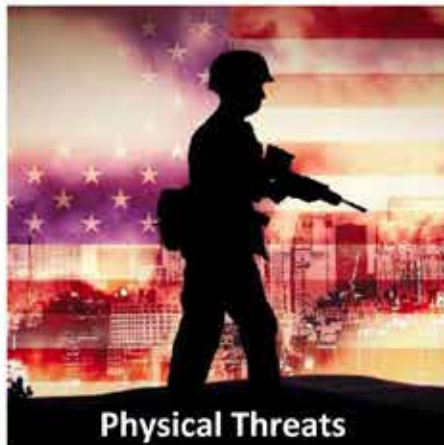
The Electricity Grid



External Drivers for a Modern Grid



Our 21st Century needs a 21st Century grid to adapt to new threats, energy sources, and economic drivers





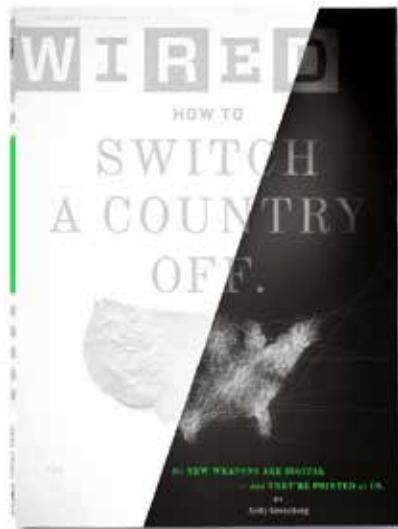
“Resilience” Events Are Rising in Frequency and Impact



Manhattan at night after Hurricane Sandy



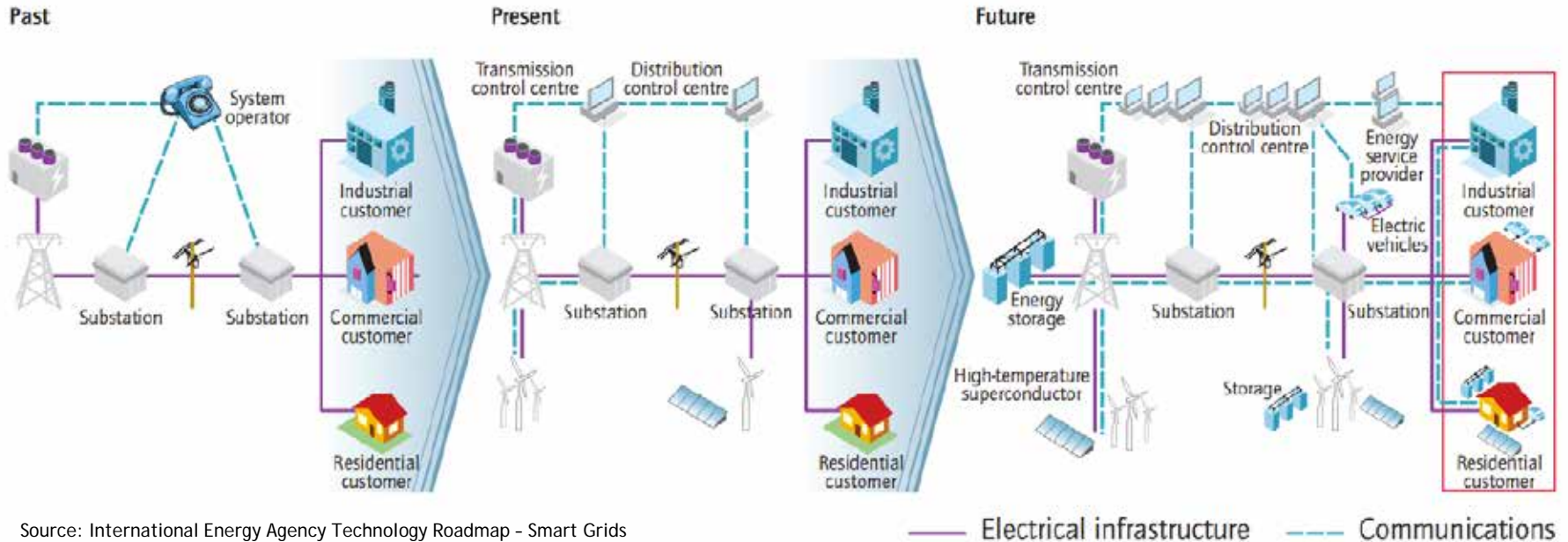
Puerto Rico hit by Hurricane Maria



Wired Magazine cover story on cyber attack on Ukraine's electric grid



Grid Evolution and the Future Grid



Source: International Energy Agency Technology Roadmap - Smart Grids

Grid 2.0

- ▶ Integration of renewables and distributed generation beginning to take off
- ▶ Minimal tools to manage grid instabilities

Future Grid

- ▶ Distributed generation and two-way energy flows
- ▶ Large scale renewable integration. Ability to manage diverse generation mix and intermittency