Game Changers: Components of New Grid Model

- Rapid growth in utility-grade renewables
- The rise of consumer-owned solar
- 33% renewables goal by 2020
- 50% by 2030
New Operational Challenges: **Oversupply and Ramping**

**10,000 MW Ramp**
Nov. 2015

**Potential Oversupply**
Oversupply in 2024 – Each dot represents an hour - assuming 40% renewables

Potential Solutions
- Storage, (targeted) efficiency, DR (up and down)
- Economic dispatch of renewables
- Decarbonize transportation (EVs, Hydrogen)
- Retrofit existing plants – lower Pmin; more flexible
- TOU rates with grid conditions
- Deepen regional coordination
The Rise of the Consumer & the New Energy Network
An entirely new grid construct

- Clean
- Reliable
- Affordable