

# Liberty Utilities Battery Storage Pilot



September 27, 2018

Business Energy Innovation Conference

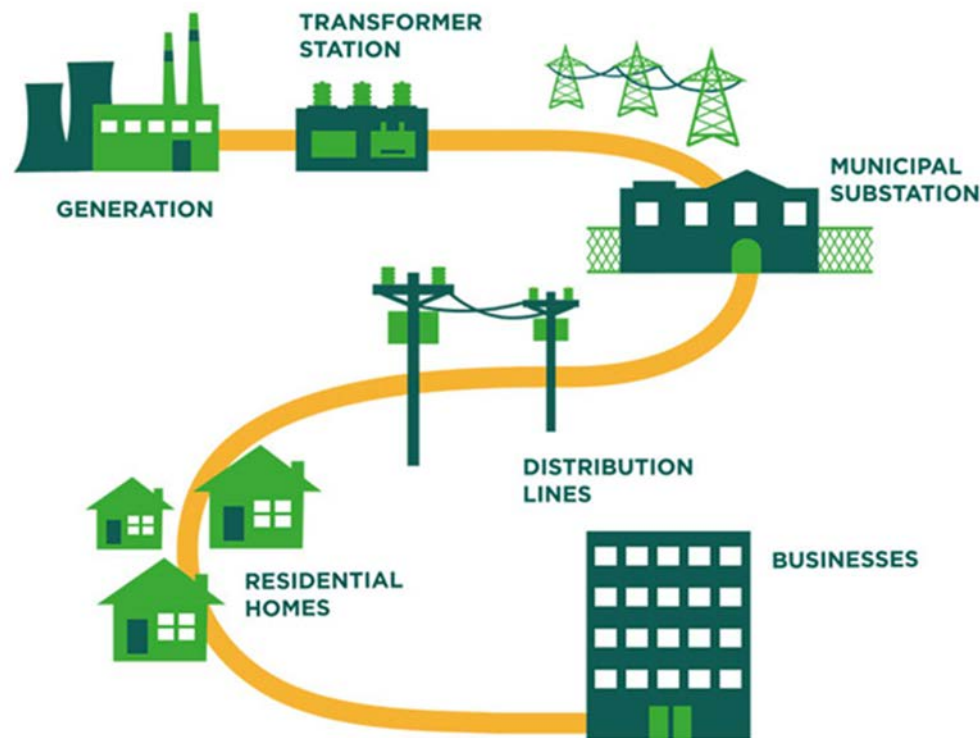
# Utility 1.0 – The Classic Electric Utility

## Characteristics of Utility 1.0

- Large, regulated monopoly
- Protected by barriers to entry
- Predictable, stable return on equity
- A provider of **safe, reliable** and **affordable** services

## Disruptors of Utility 1.0

- Declining renewable energy costs
- Energy storage will eventually facilitate customer independence



*The Traditional Utility 1.0 Power Grid = A Central, One-Way Power System*

# Attributes of a Company in the Utility 2.0 World

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Acknowledge the importance of **customer centricity**



Willing to embrace **new technologies + business models**



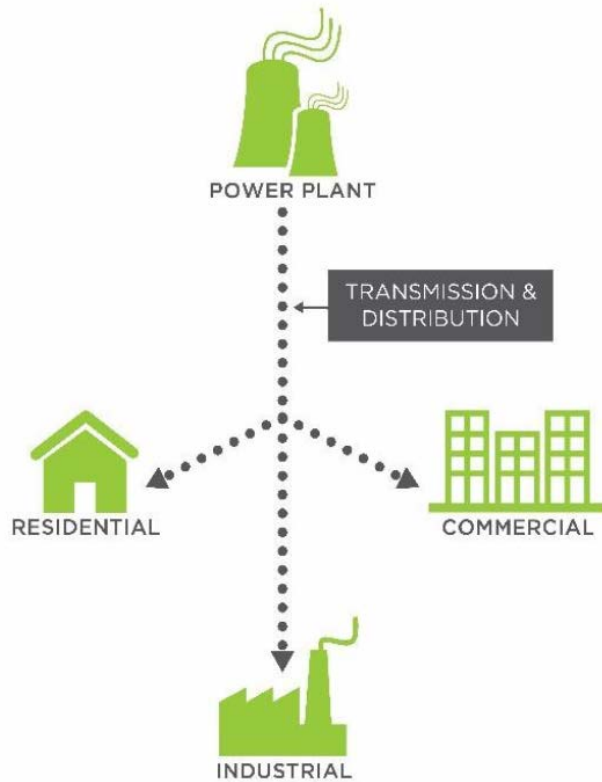
Dedicated focus on **cost-competitiveness**

*Utility 2.0 = Customer-focused, Innovative, and Competitive*

# Active Involvement in Utility 2.0

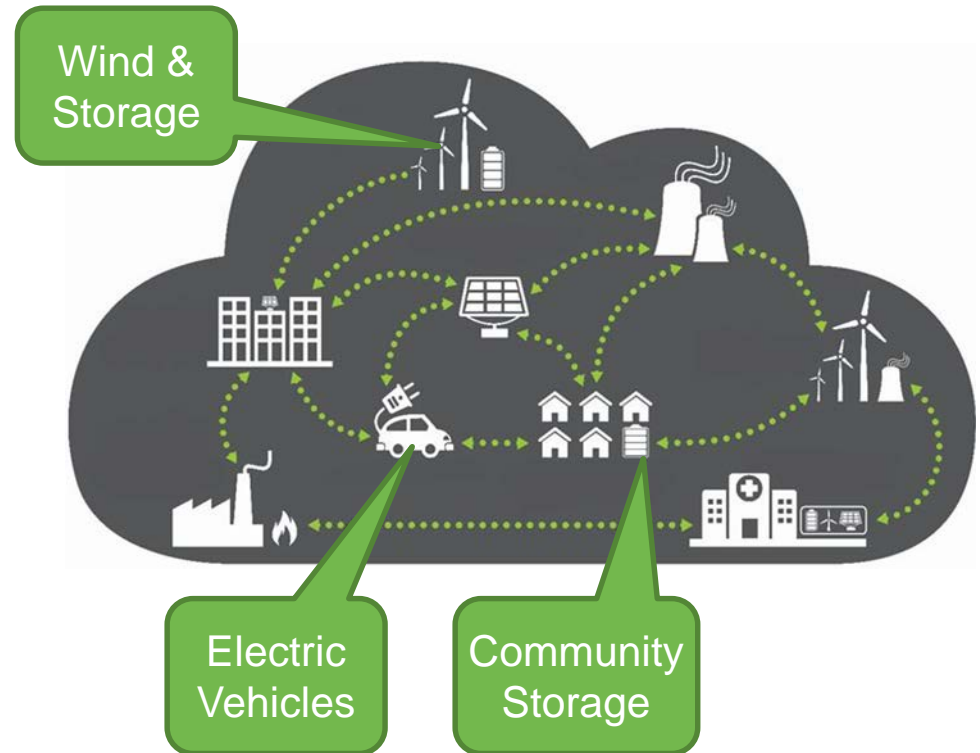
## Utility 1.0

Central, One-Way Power System



## Utility 2.0

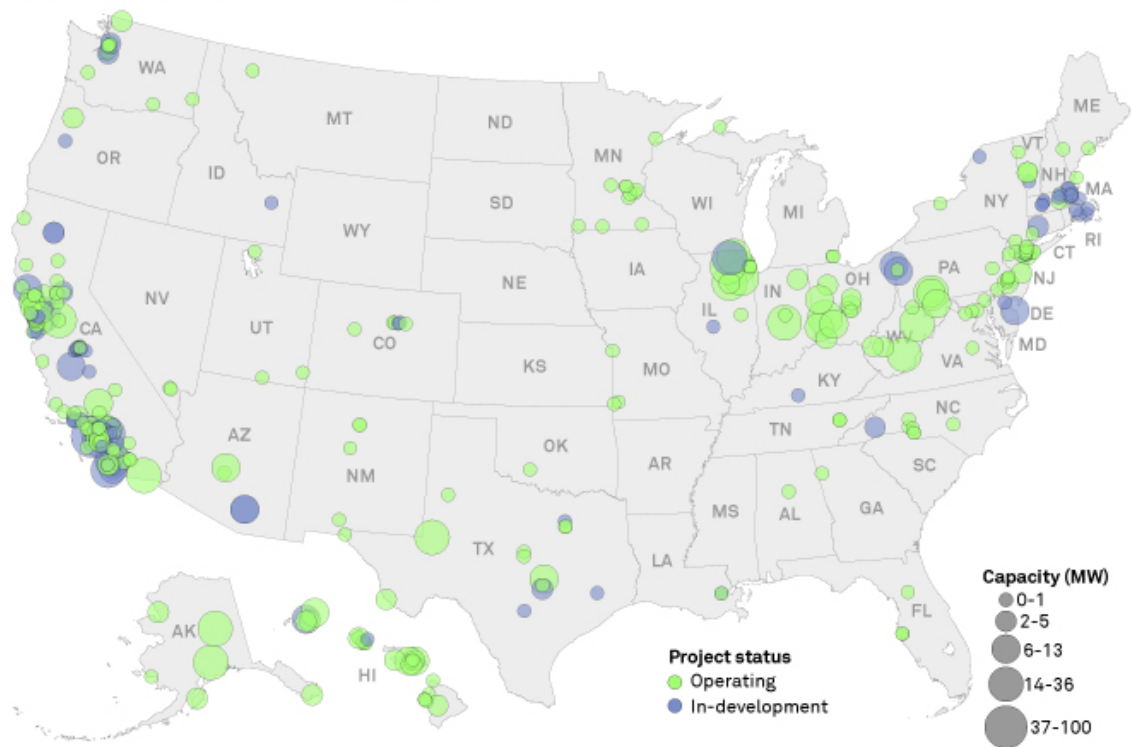
Distributed, Two-Way Power Flows



# Battery Storage Across the US

- NH is surrounded by battery storage

US battery storage capacity (MW)



**S&P Global**

Market Intelligence

As of September 6, 2017.

Includes electro-chemical battery storage projects only.

In-development status consists of contracted projects or projects in other near-term stages of development.

Operating status consists of completed and offline/under-repair projects.

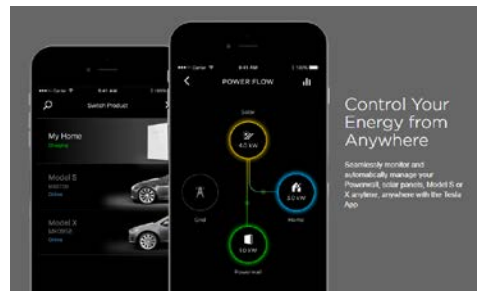
Sources: S&P Global Market Intelligence; U.S. Department of Energy - Global Energy Storage Database

Map credit: VA Odevilas

# Pilot Overview

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- Liberty to own batteries installed in customer homes
  - Requires Wi-Fi and 4G cell service in the area
- Customer will have access to battery 24/7, except when peak is predicted, then utility will control access
- Immediate goal is to reduce Regional Network System and Local Network System transmission costs
- Long-term goal: study batteries to see effect on distribution system and potential deferral/avoidance of future upgrades to system
- Backup power for power outages
  - Depending on home load, backup power could last approximately 12 hours
- Time-of-Use rates allow customers to actively engage in energy usage



# Battery Technology

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- **Tesla Powerwall 2: 13.5 kWh, 5kW capacity**
- **Uses cloud platform to provide integration of batteries into grid**
  - Utility and customer has access to data
  - Platform can report historical data to the utility and the customer
- **10 year warranty on battery**
- **Approximately 15 year useful life**
- **Load Shifting Mode will allow customers to charge off peak and offset home load at critical peak hours**



# Questions?

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