Electric Delivery Reimagined

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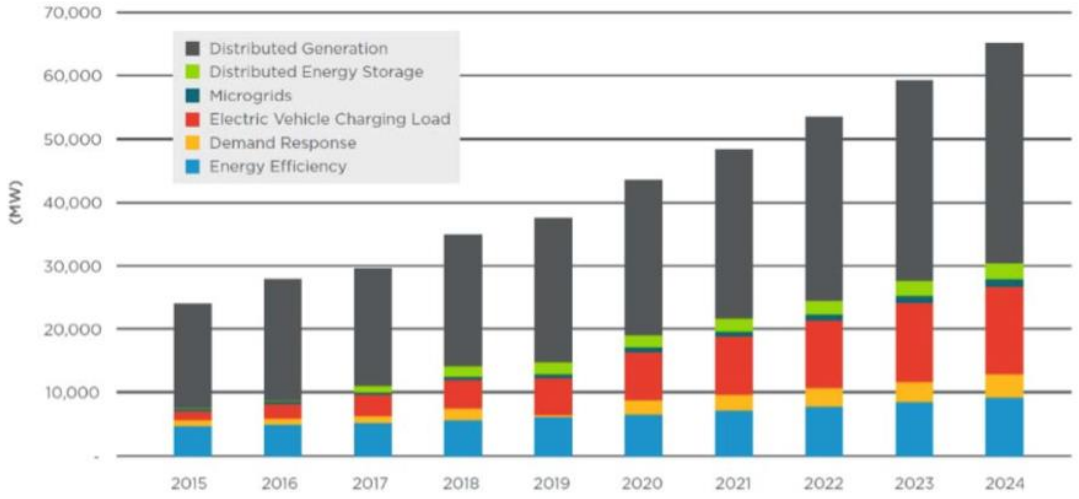
Are customers looking for an energy revolution?

- Distributed solar represented 12% of new capacity additions in 2016
- Navigant projects growth due to regulatory mandates, favorable economics:

Figure 2 – U.S. Annual Installed DER Power Capacity Additions by DER Technology, 2015-2024



Source: Navigant analysis[9]

Most drivers of DER growth are not new.

1. Desire to save money

1. Interest in reliability (combined with new IT capabilities)

1. New capabilities from other technology

1. Preference for renewable energy

The energy revolution is about serving customers better, even if their preferences are unchanged.

1. Many customers want the same things they have always had.
2. The value of reimagining energy delivery is mainly on the *backend*.

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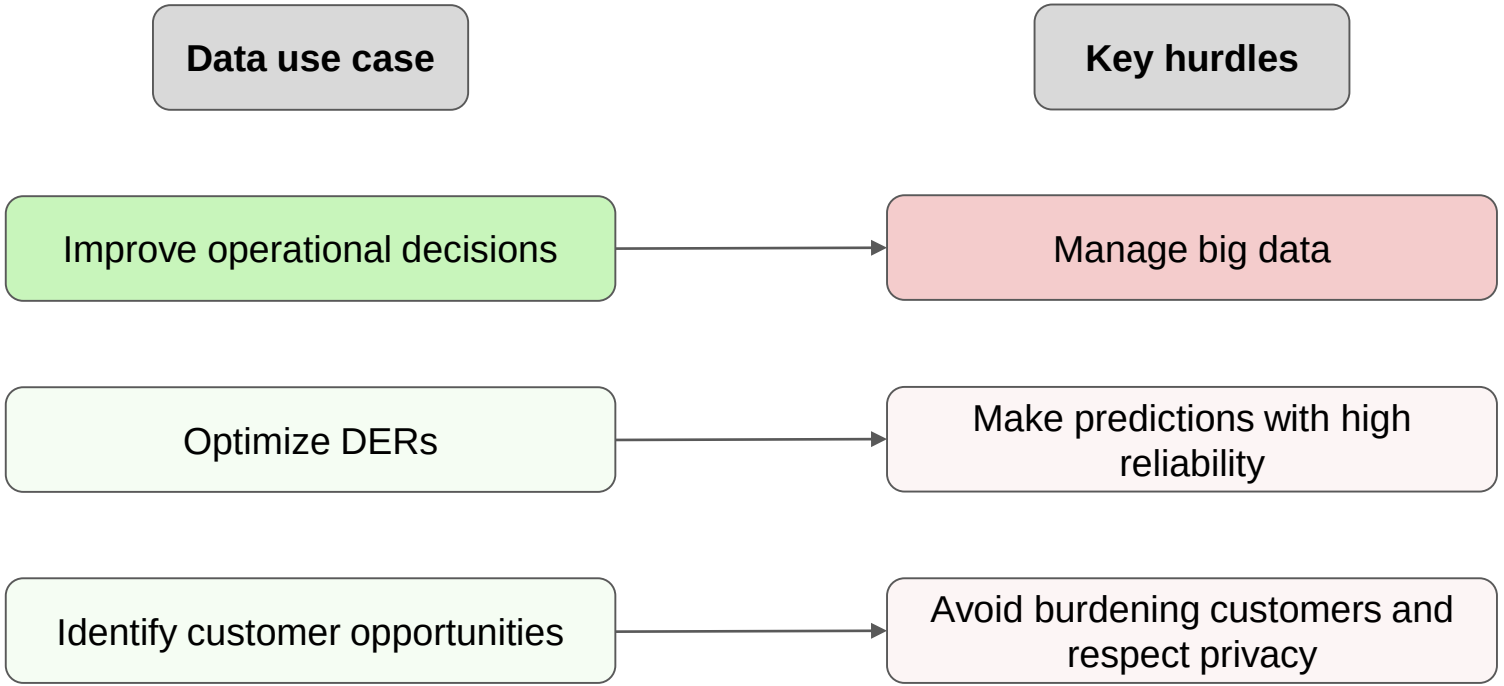

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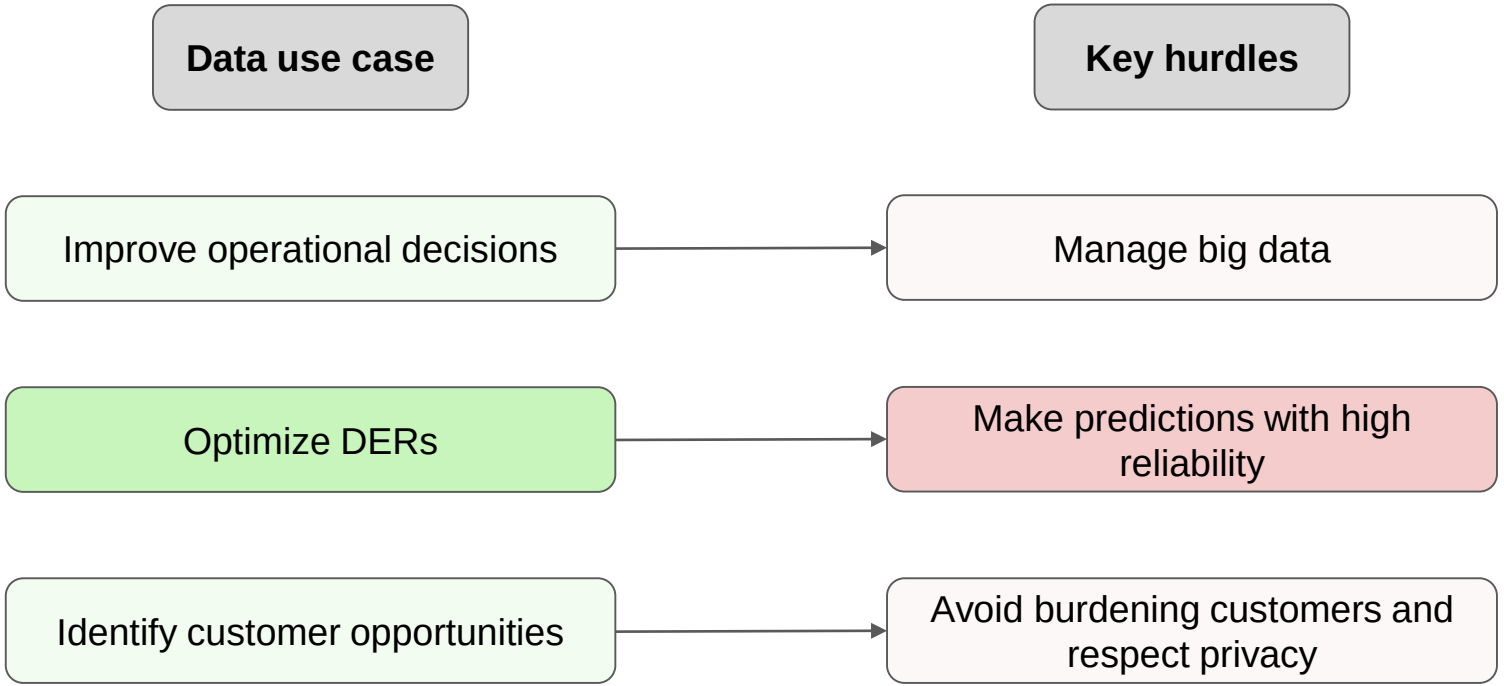

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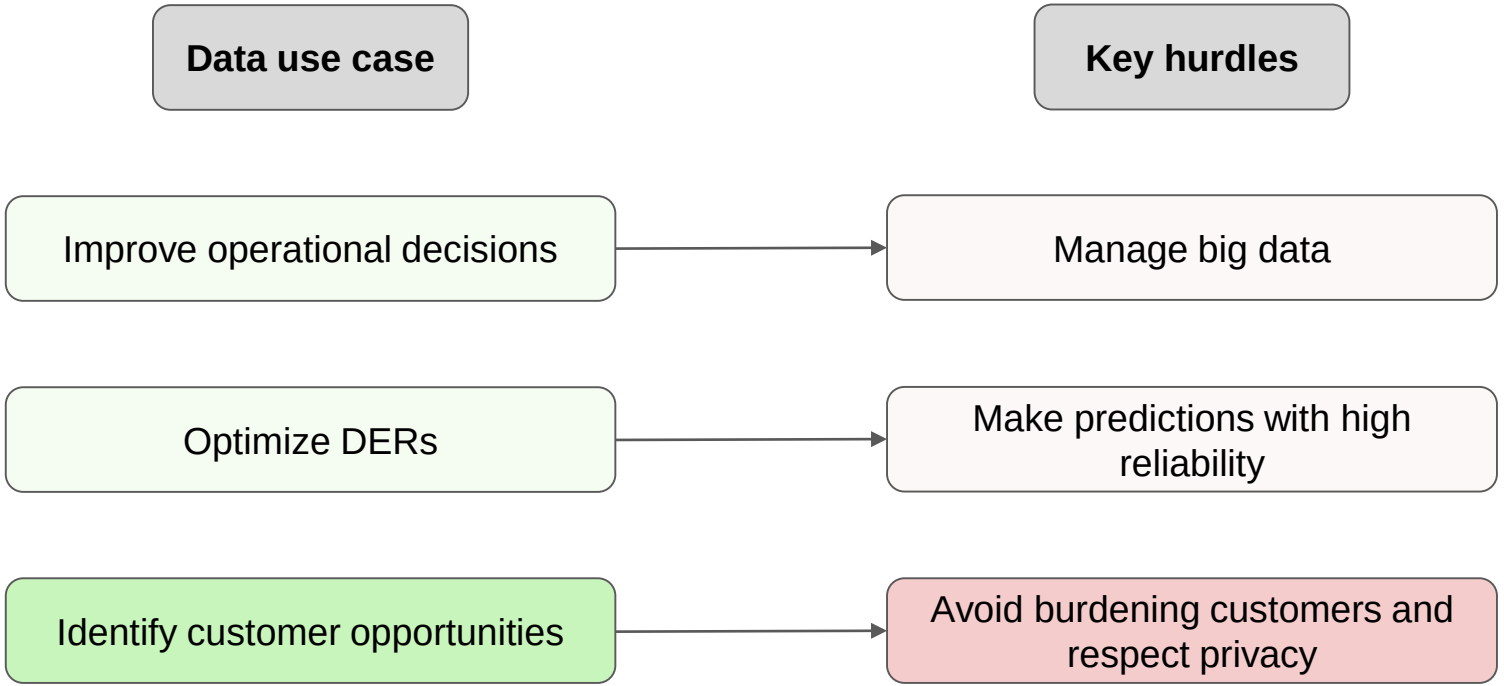

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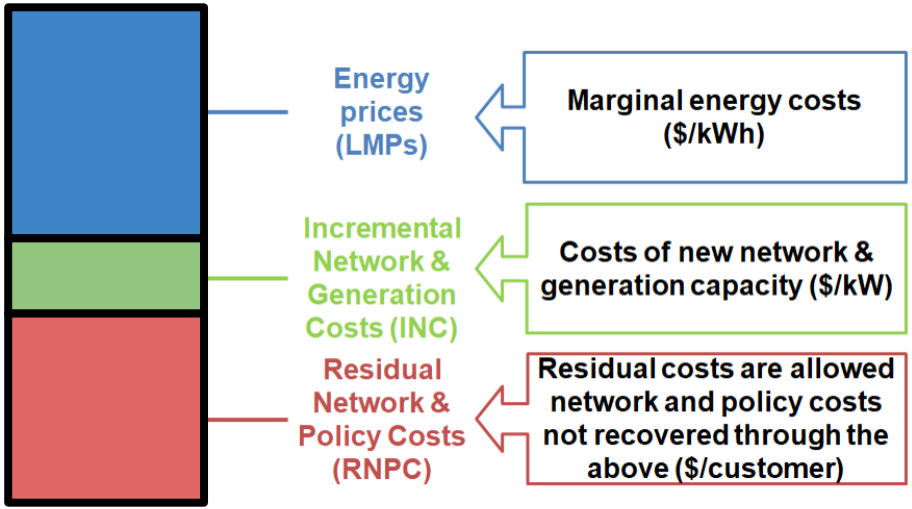
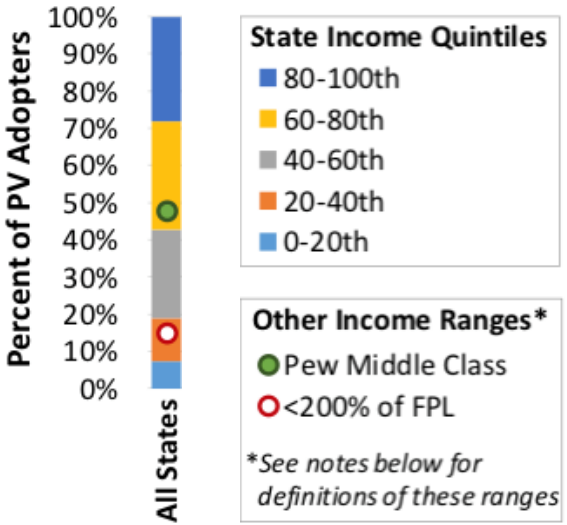
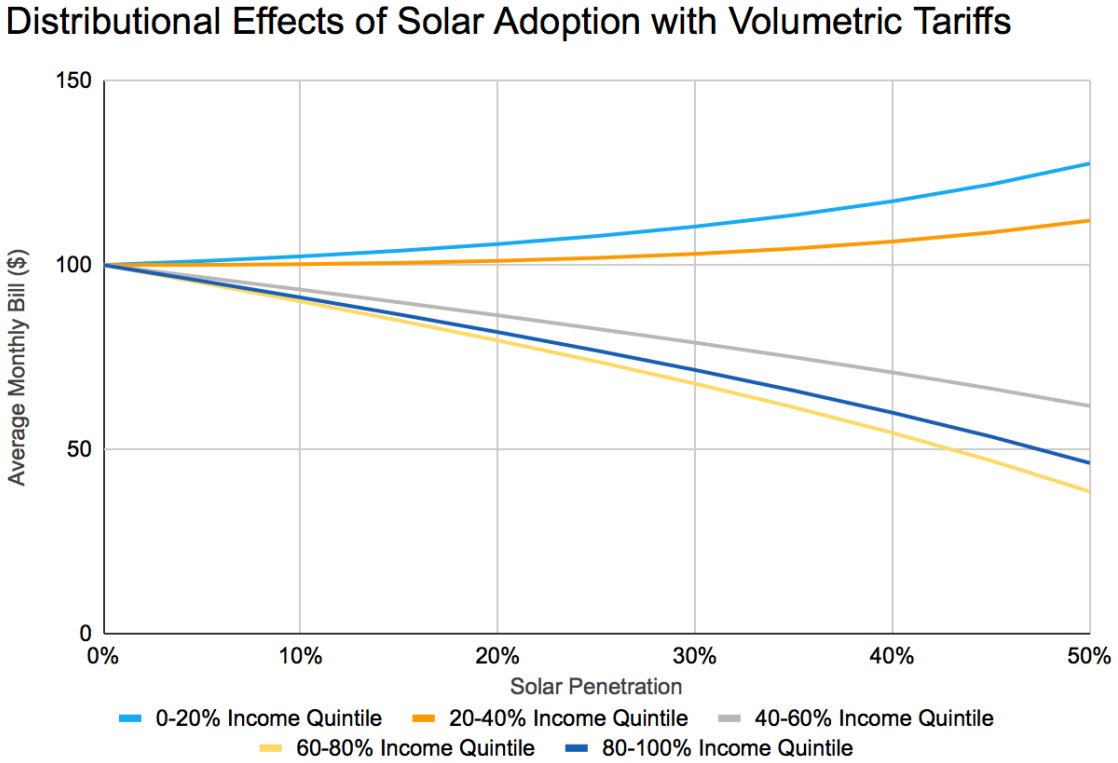
DERs are disrupting outdated electricity rate design

- Four obvious inefficiencies with current rate design:
  - Not time-based
  - Not location-based
  - Fixed costs recovered volumetrically
  - Don’t account for capital investments going forward



Pressure from DERs will drive regulatory changes

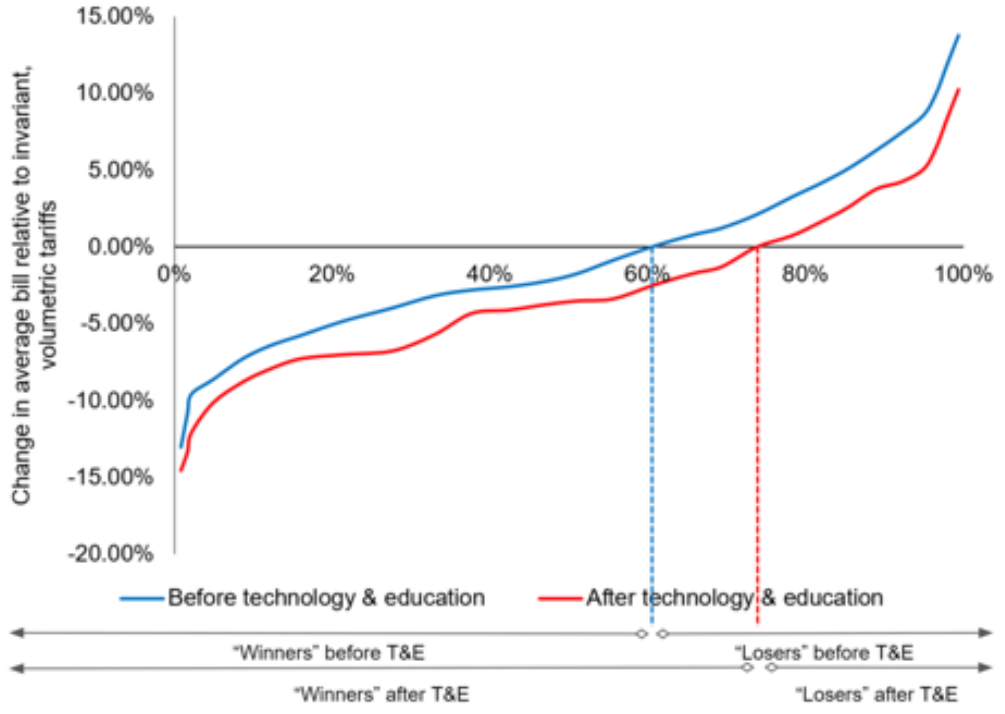




New tariff designs focus on efficiency and other issues.

- Distributional Equity

- Transitional Concerns



Key Takeaways:

- Preferences are not changing drastically, but renewable energy goals and new communications technology are driving an energy revolution.

- For new energy business models, focus on core customer desires -- clean, reliable, inexpensive -- and minimize friction everywhere else.

- If prices and incentives are efficient and fair, then customers will be better off regardless of their preferences.

What issues impact the value of data for the utility?

Data usage: Demand, maintenance needs, scheduling upgrades, utility use cases include more efficient use and integration of renewable energy, cybersecurity threat detection and response, and portfolio and asset management.

Data storage: external companies can help provide utilities more opportunity to use data; companies can vie to offer them services from the data.

Data extent: companies may be “drowning in data”. Enterprise solutions can help them understand what has value and what they should keep.

Data availability: how can utilities make data available to DER providers in ways that don’t compromise customer privacy?

Demand growth is occurring for services that have natural flexibility.

- EV charging
- Electrified heat and hot water
- Data centers
- Indoor farming and cannabis production
- Electrification of industrial processes

Customers want **affordable, reliable, clean** power from their local utilities.

An energy revolution will make this possible.