State of Corporate Renewable Energy Procurement in the United States

David Gardiner and Associates
July 11, 2018

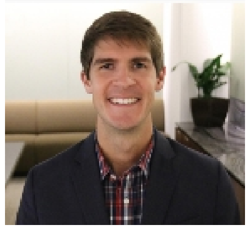
David Gardiner and Associates

Agenda

- Welcome and introductions
- Key findings from industry reports on renewable energy growth
- Discussion of increased corporate demand
- Moderated panel
- Audience Q&A

Attendees can submit written questions through the GoToWebinar side panel.

Featuring



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Director, Research, Solar Energy Industries Association

Hannah Hunt, Panelist
Deputy Director, Electricity Policy and Demand,
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Jenna Goodward, Panelist
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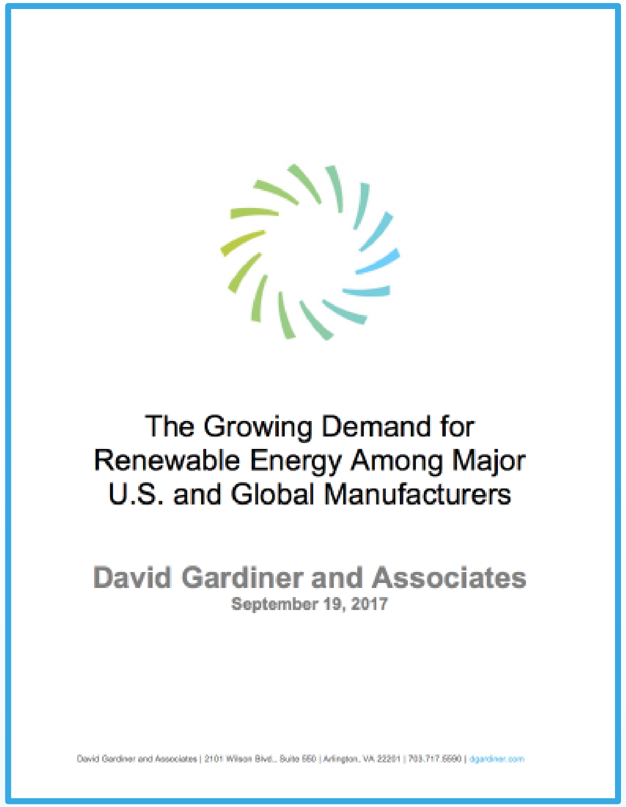
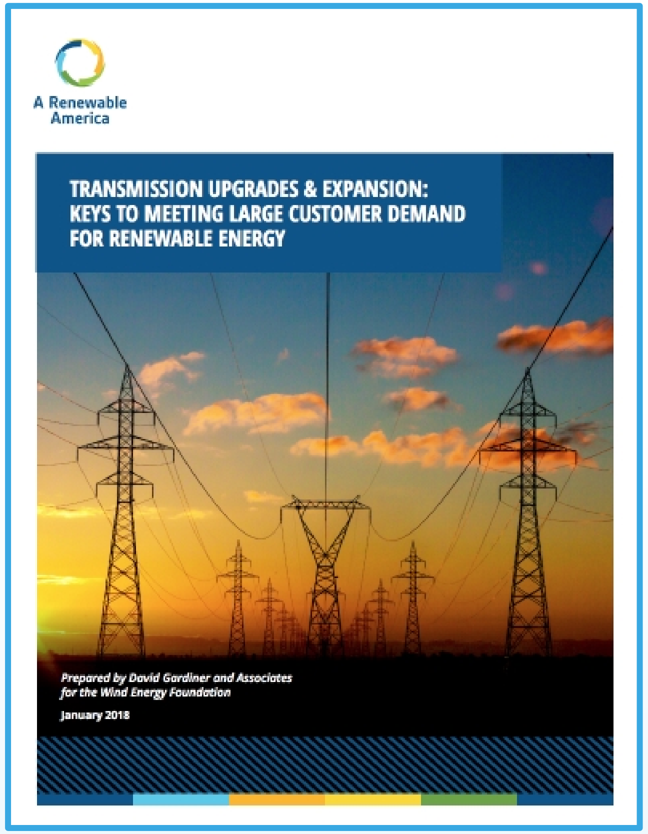
Growing Corporate Interest in Renewables

- Nearly half of the companies in the Fortune 500 and 63 percent of the Fortune 100 have set clean energy goals
- 138 companies have joined RE100, such as AB InBev, Apple, GM, IKEA, Microsoft, Morgan Stanley, Nike, Walmart, and Unilever
- 75 companies have signed onto the Corporate Renewable Energy Buyers' Principles

Our Work on Large Customer Renewable Energy Procurement





DGA is sharing the latest news about policy and market trends:

@CustomerREVO on Twitter   Customer Revolution Monthly Newsletter

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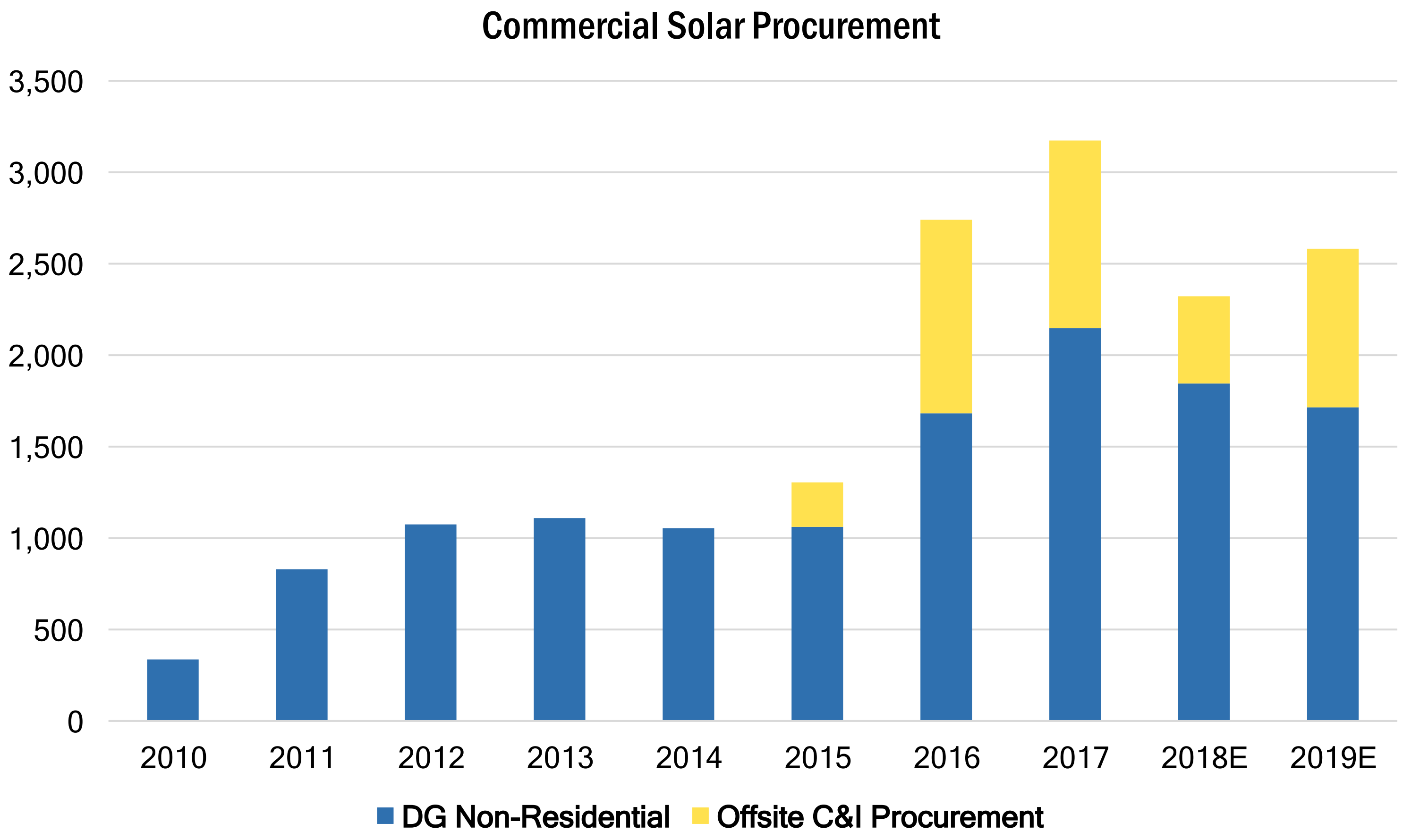
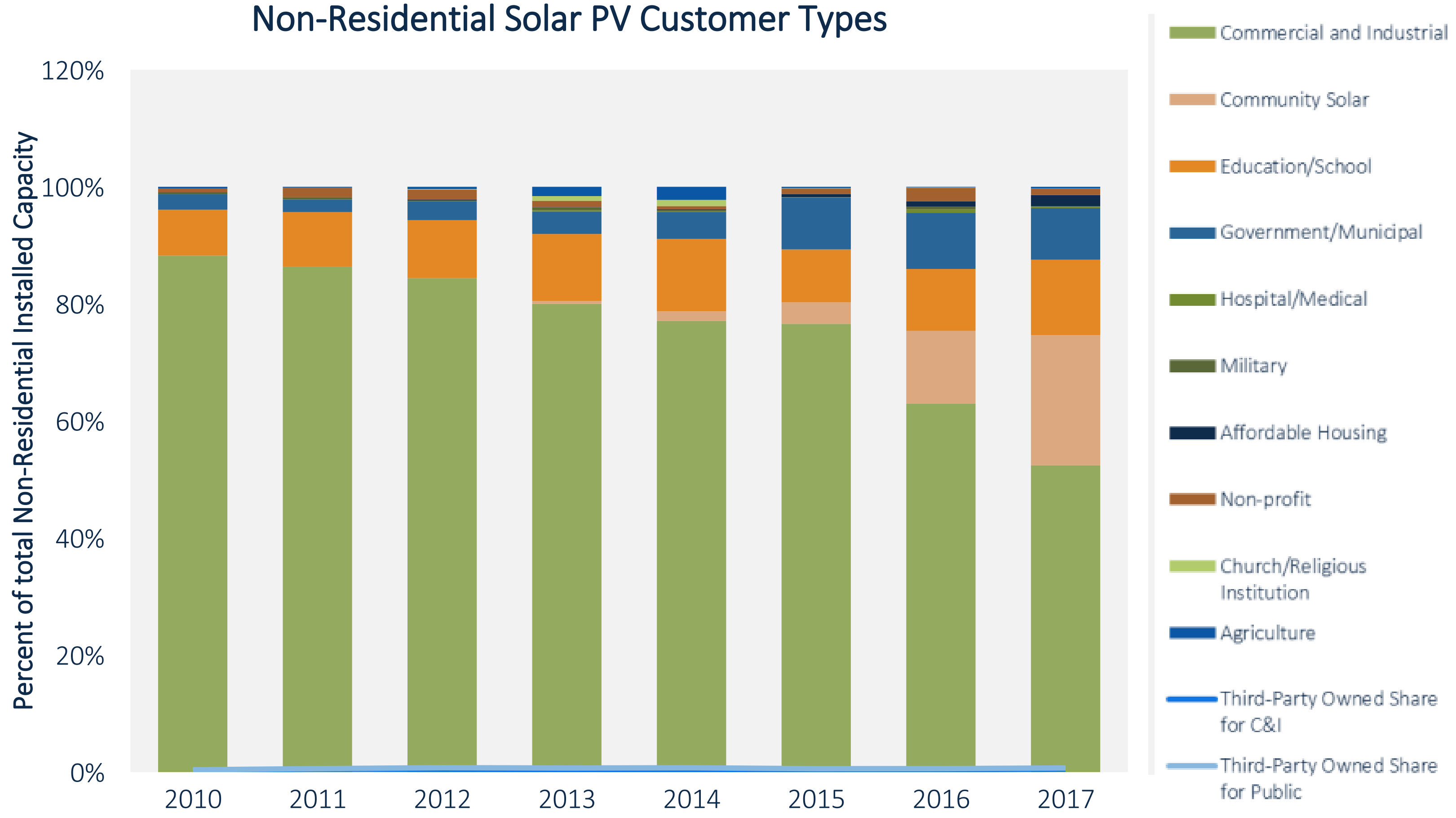
Rapid Increases in Corporate Procurement



Source: GTM Research

- After several flat years, corporate procurement ramps in 2016 and 2017 due to
    - growth of off-site projects;
    - ITC demand pull-in
    - falling costs
    - Demand pull-in from expiring incentives/rate changes
- Corporate procurement accounted for 30% of all solar capacity brought online in 2017- highest total since 2010
- Current and future growth a product of expanded procurement options
    - Physical and Virtual PPAs
    - Green Tariffs
    - Community Solar
    - Commercial PACE

Changing Sources of On-Site Non-Residential Demand



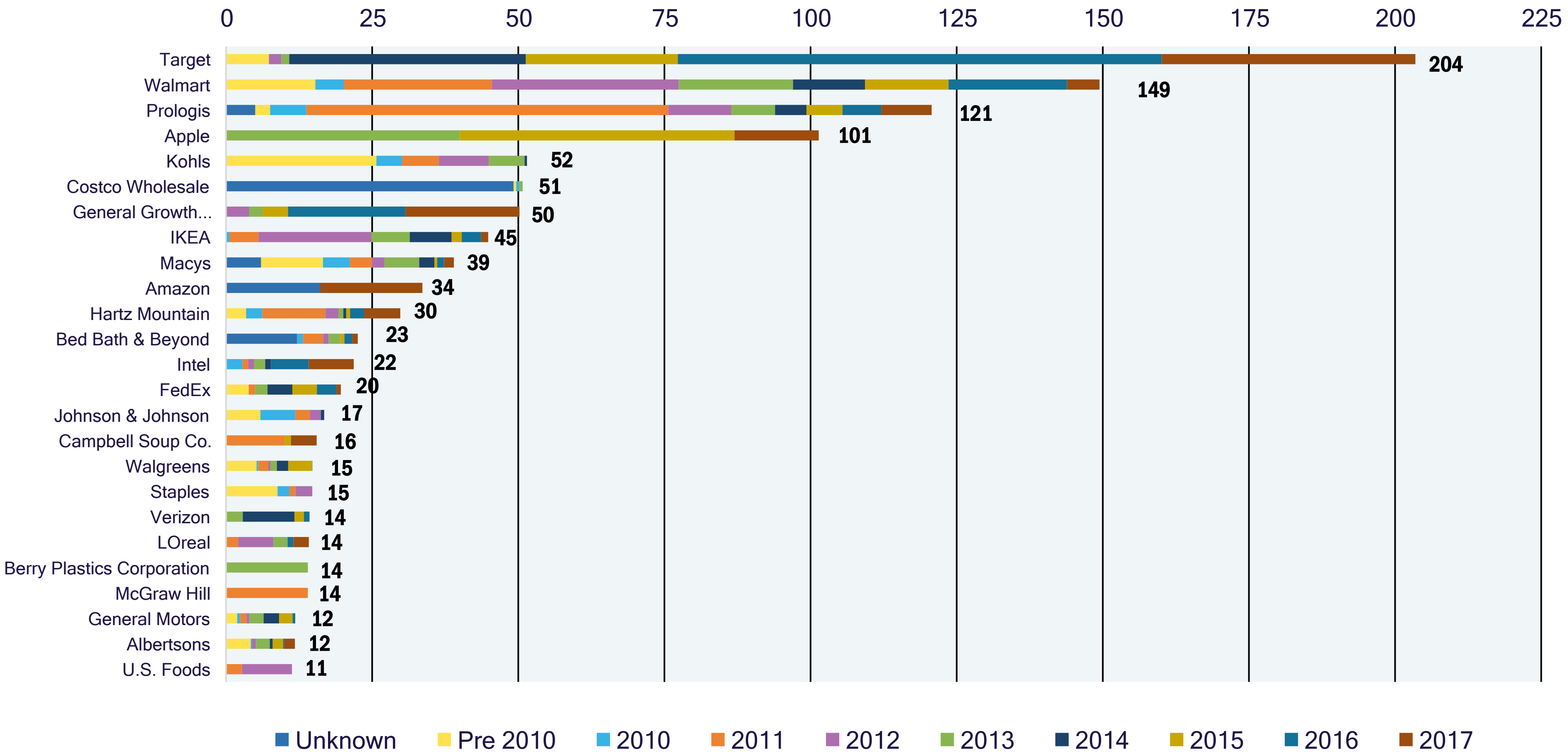
Source: GTM Research

- Traditional C&I losing share (but not MWs) to community solar; non-profit/gov't
- At same time, 3rd party ownership share increasing for both public and private customers
    - Contrast to residential market

Top Corporate Users

- **Target** takes the top spot for the second consecutive year
- **Walmart** has ranked 1st or 2nd for corporate solar every year since the report debuted in 2012
- **GGP Inc.** moves up 2 spots after extensive additions in 2016 and 2017
- **Amazon** makes the list for the first time with surge of installations in 2017

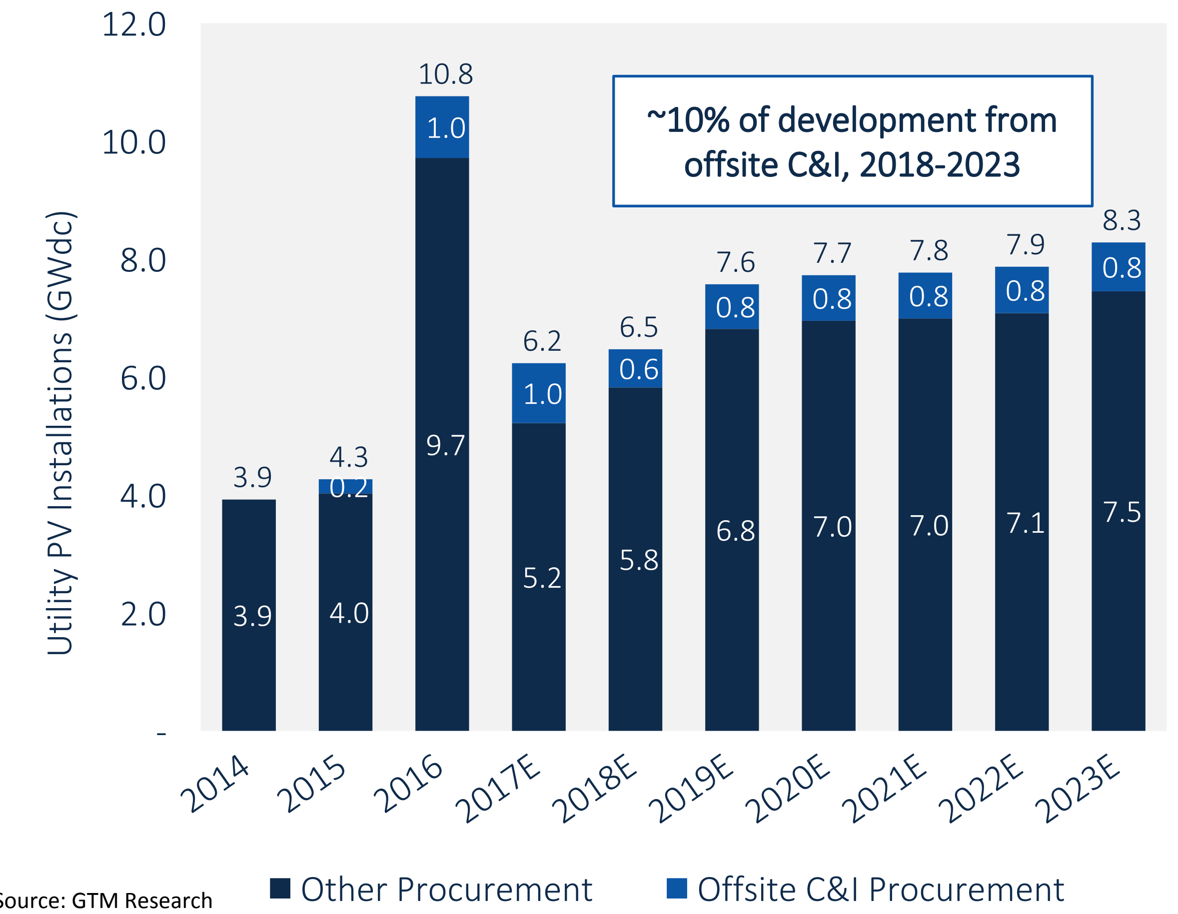
Top 25 Corporate Solar Users by Installed Capacity (Megawatts)



Source: SEIA, *Solar Means Business*

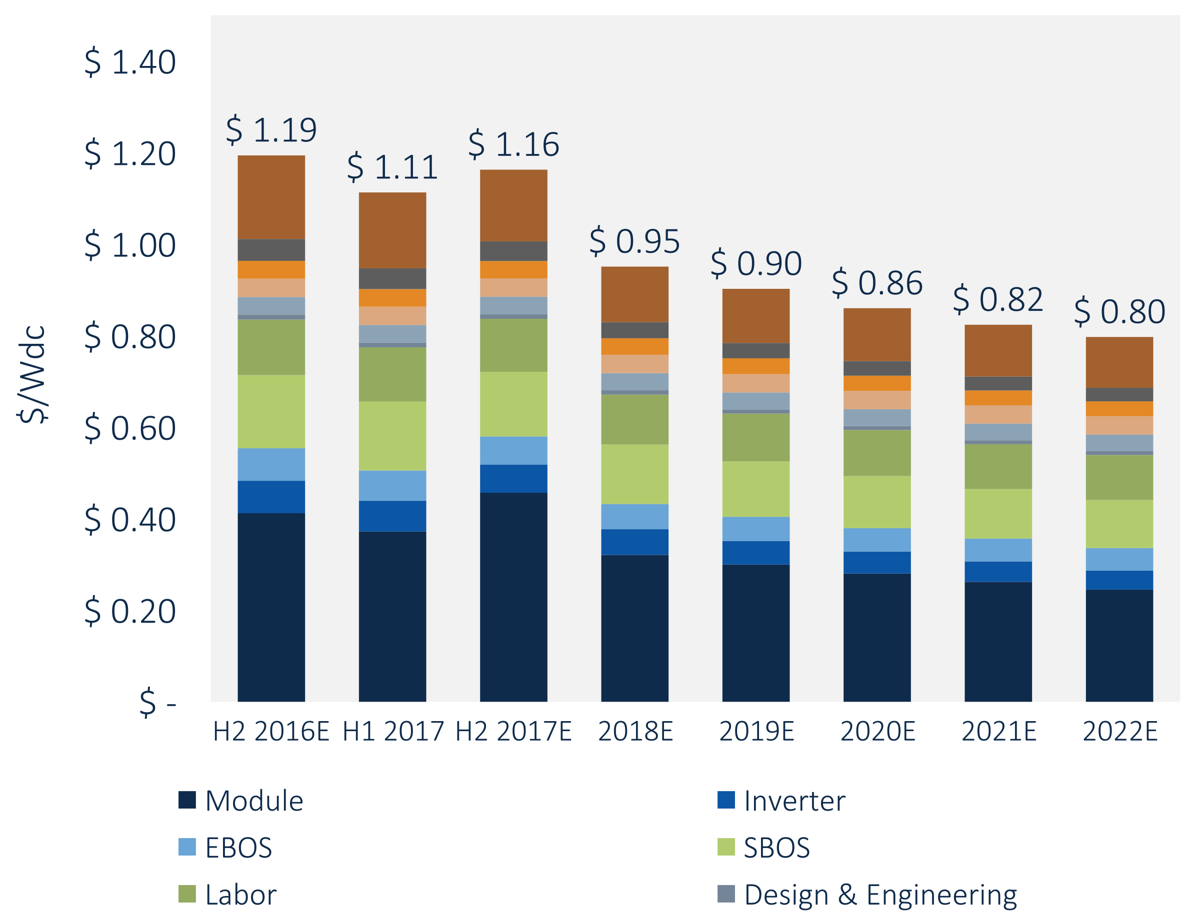
Off-Site Corporate Grows as Prices Fall, Despite Tariff

U.S. Utility PV Forecast 2018-2023



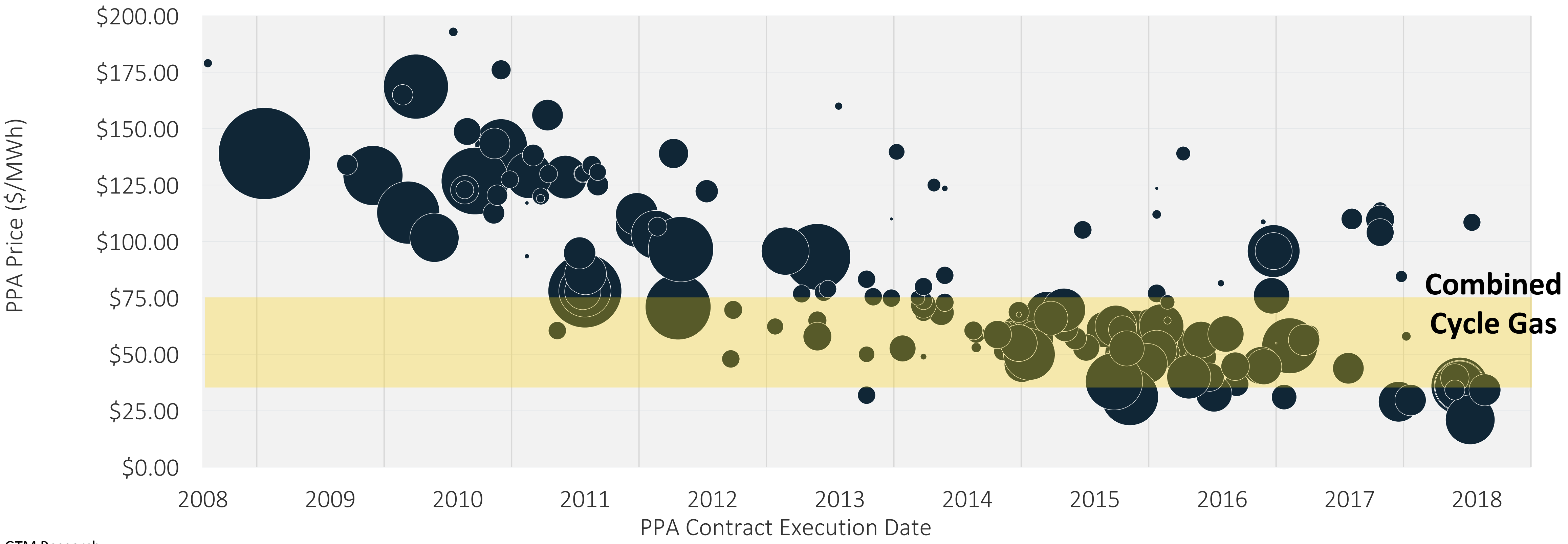
Source: GTM Research

U.S. Utility Fixed-Tilt PV System Pricing H2 2016-2022E ($/Wdc)



Competitiveness of Utility-Scale Solar Drives Demand

Utility PV PPA Prices by Contract Execution Date



Source: GTM Research




Challenges and Opportunities for Commercial Solar

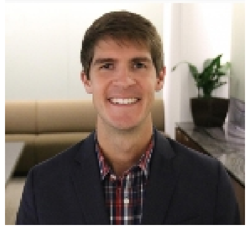
Challenges

- Solar Module Tariff will raise prices and slow growth from 2018 – 2021
- Declining state-level incentives
- Less attractive rate design
- Decline of Federal Investment Tax Credit
- Move from early adopters to mainstream commercial consumers in established markets; customer acquisition issues

Opportunities

- Non-module hardware costs continue to decline; lots of room for non-hardware (soft) costs to decline
- Increased electrification (EVs), internet of things, pushing wide variety of companies to think differently about electricity
- Decreased costs of storage and solar opens up markets to companies looking for alternative resilience and cost saving options
- More large corporates opting for 100% renewables commitment
- As costs come down, tons of room for growth in non-traditional state markets

Featuring



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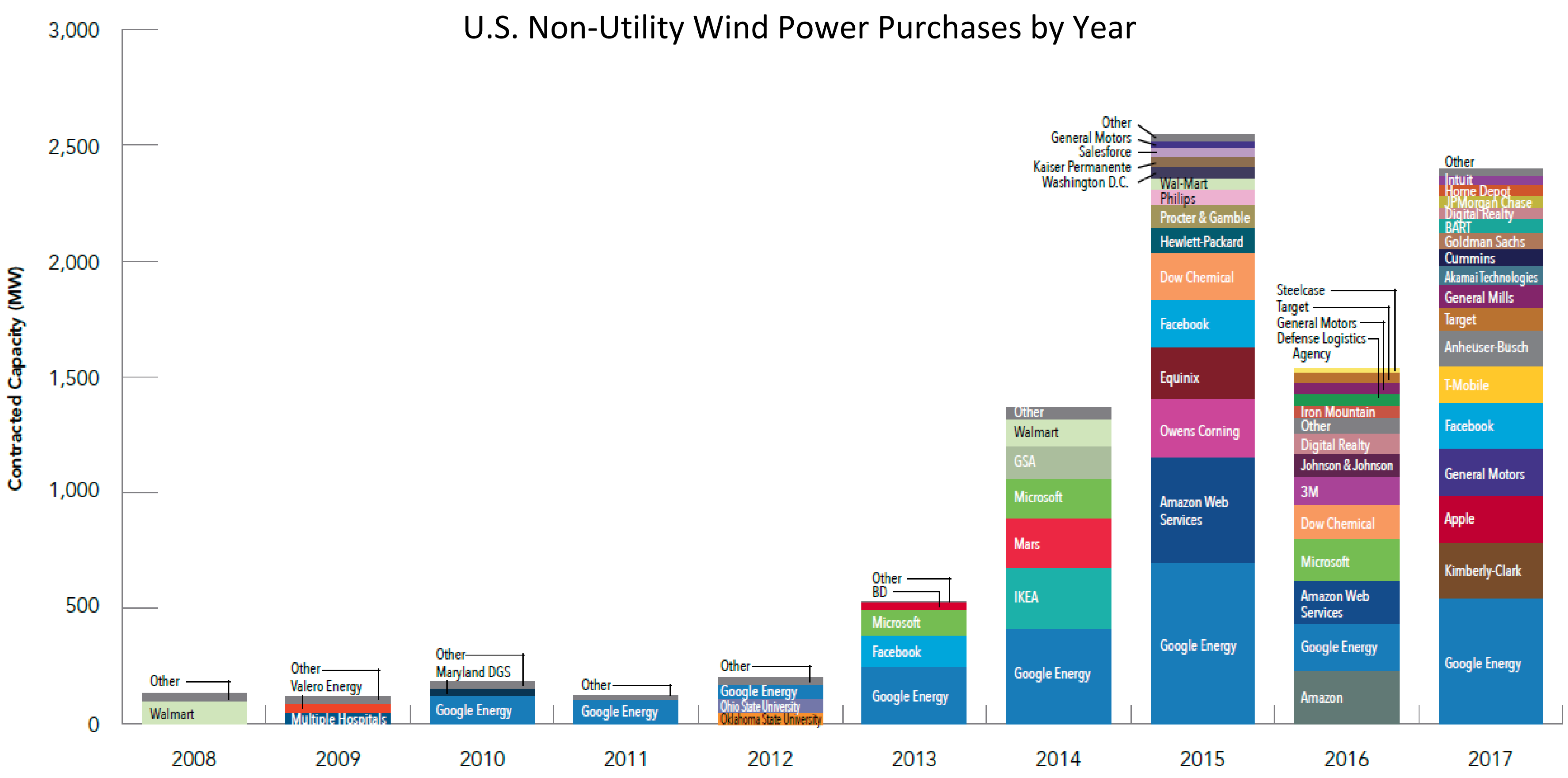
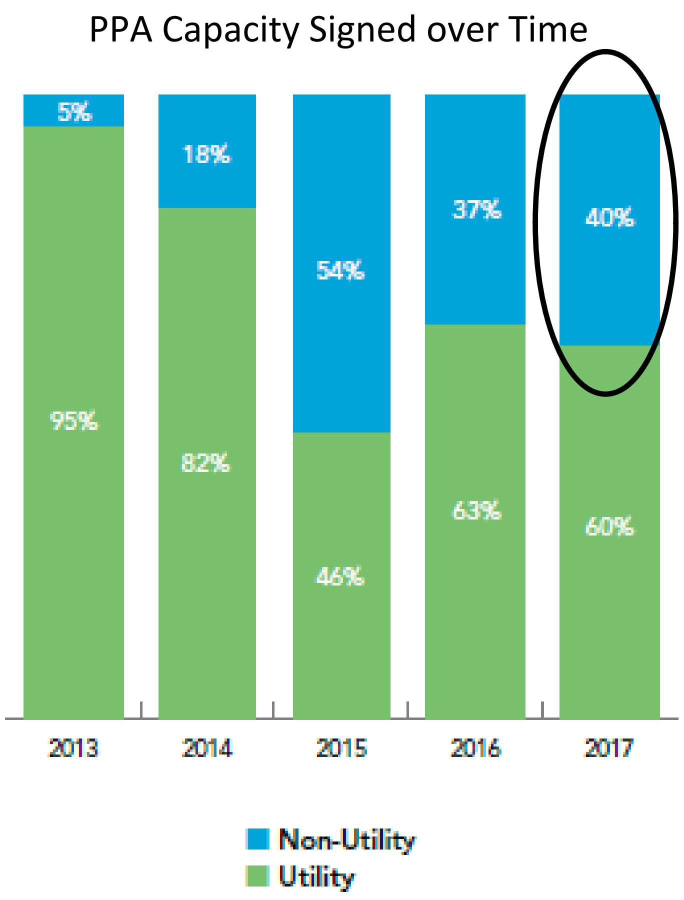
C&I customers procured over 2,400 MW of wind power in 2017



- Additional 1,359 MW procured in 1Q 2018
- Over 10,000 MW procured from 2008 - 1Q 2018
- C&I customers represent 95% of total non-utility procurement

Source: AWEA U.S. Wind Industry Annual Market Report Year Ending 2017

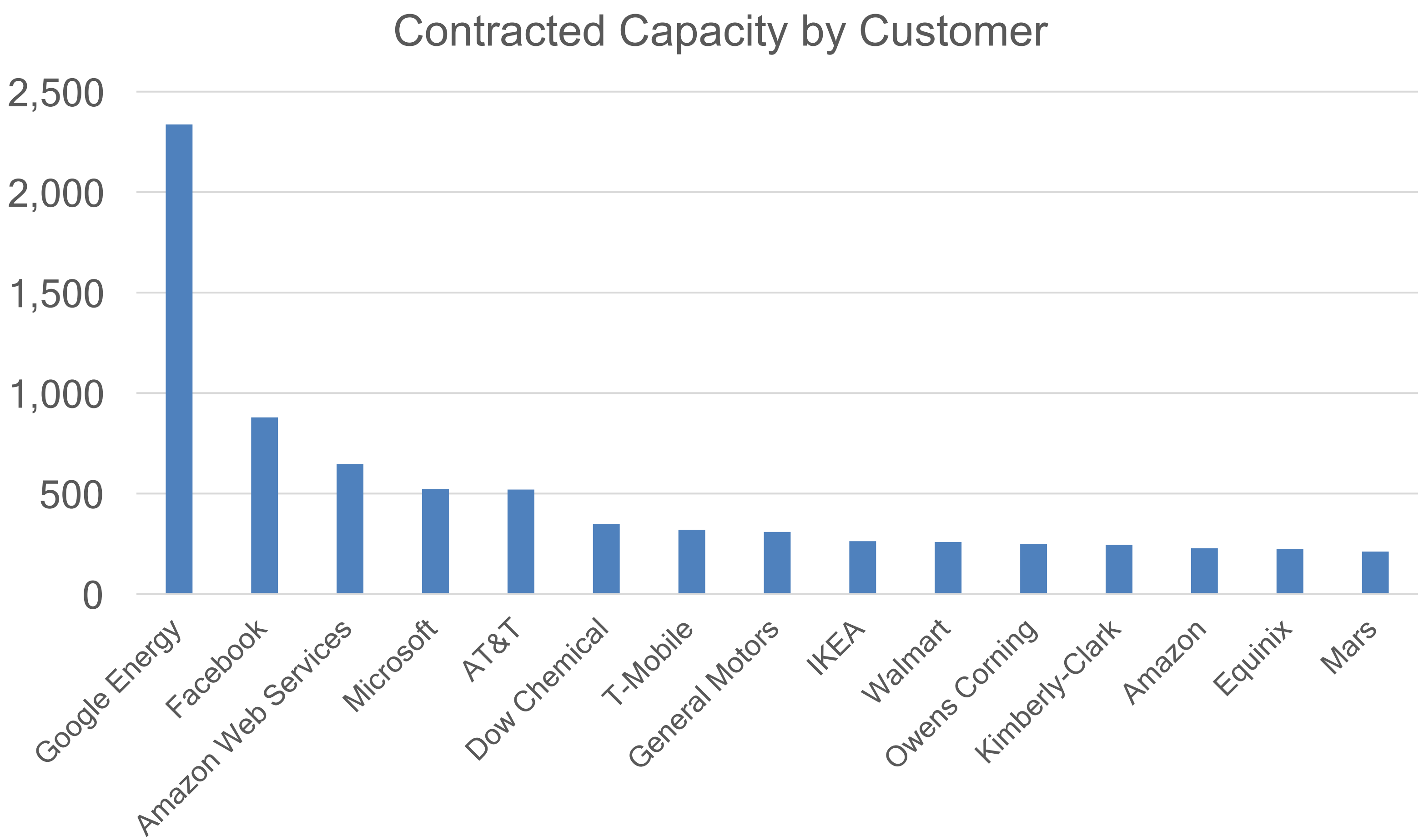
Non-utility customers represent 40% of total wind capacity contracted via PPAs in 2017



- PPAs continue as preferred offtake method for C&I customers (83% of total)
- Increased diversity in procurement options
  - Green Tariffs
  - Direct Investment
  - Long-term REC purchases

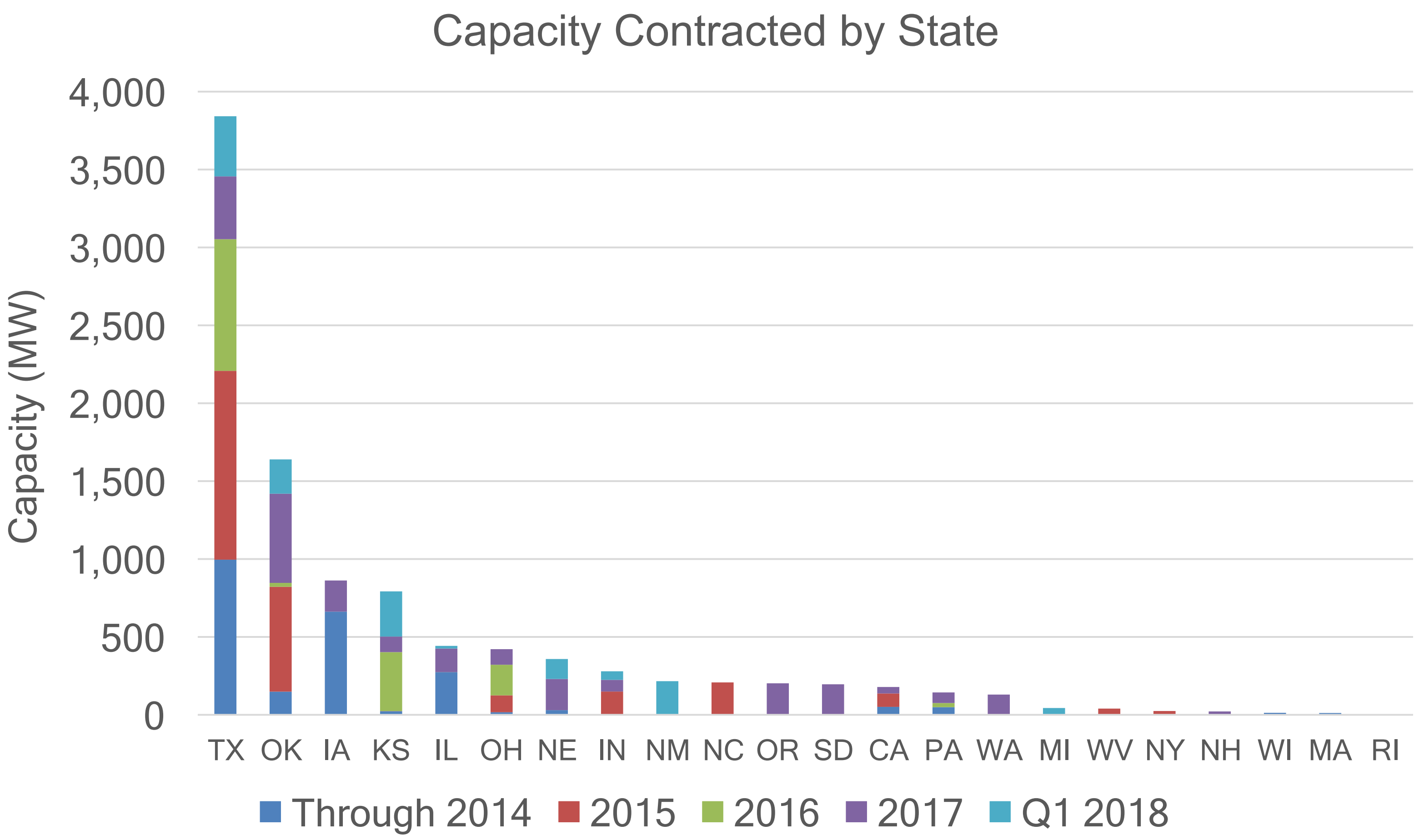
Source: AWEA U.S. Wind Industry Annual Market Report Year Ending 2017

More than 50 C&I customers have procured at least 10 MW of wind power



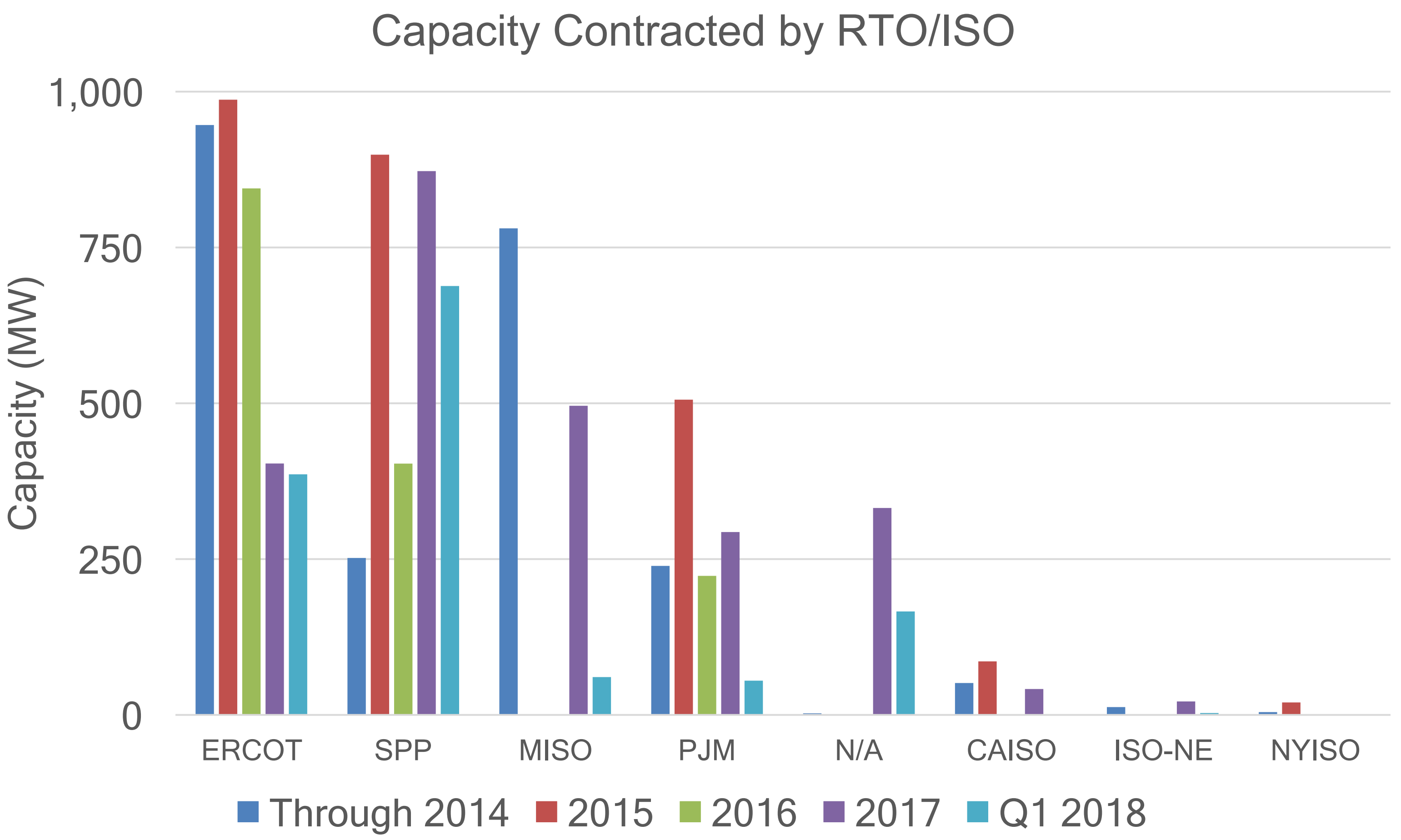
Source: AWEA U.S. Wind Industry Annual Market Report Year Ending 2017

C&I activity focused on Texas, with increasing state diversity



Source: AWEA

C&I activity concentrated in ERCOT and increasingly SPP followed by MISO and PJM

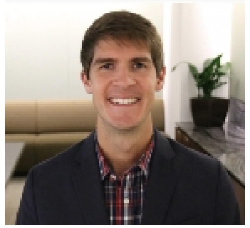


Source: AWEA

Challenges and Opportunities

- Continued wind cost declines
- Transmission investment
- RTO/ISO engagement
- Federal and state policy drivers
- Utility partnerships
- Procurement opportunities for smaller buyers

Featuring



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Powering the Cloud: Microsoft's Energy Journey

Jenna Goodward – Senior Program Manager

Webinar -- State of Corporate Renewable Energy Procurement in the U.S.

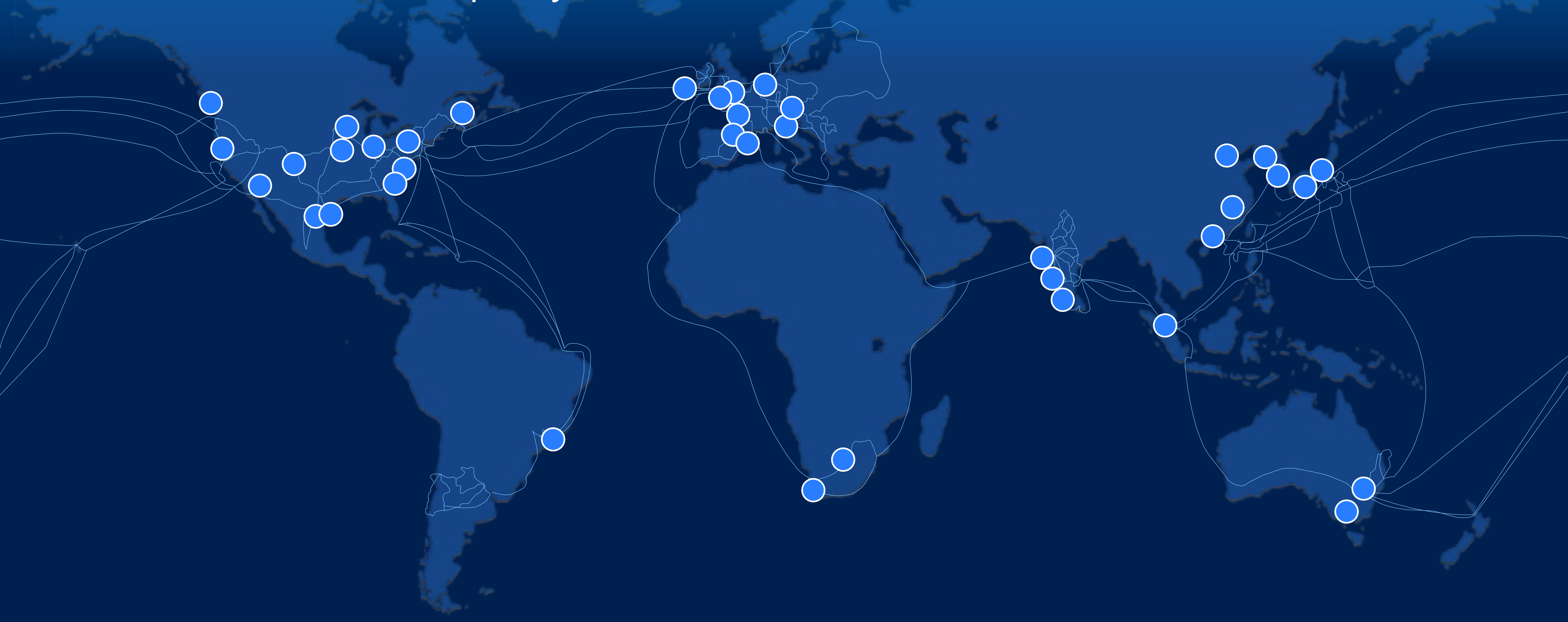
2 Mil
kilometers
intra-datacenter fiber

>1GW
installed
capacity

42
Azure regions

100+
datacenters

Millions
of servers



Commitment to sustainability

2012 → **2018** → **2020** → **Long-term goal**

- **2012**: Carbon neutral
- **2018**: 50% energy use from wind, solar & hydropower
- **2020**: 60% energy use from wind, solar & hydropower
- **Long-term goal**: 100% energy use from wind, solar & hydropower

Leading an advanced energy economy that benefits everyone

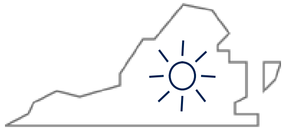
Generate clean energy

Enable the next generation of energy technology

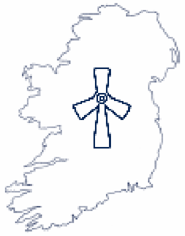
Bring new solutions to market

Generate clean energy

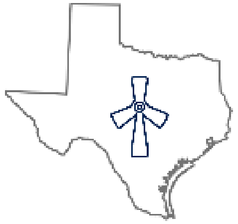
Enabling the transition towards a grid powered by carbon-free energy



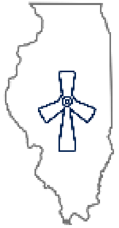
20 MW Supporting solar energy in Virginia



37 MW Advancing wind power in Ireland



110 MW New wind power in Texas



175 MW Harnessing the wind in Illinois

180 MW Capturing clean energy in the Netherlands

Next generation energy technology: Flow batteries

- As more renewables come onto the grid, use existing resources as backup power options
- Long term: Grid-interactive batteries store hours of energy vs. minutes

agder energi

Smarter grid with Agder Energi in Norway

https://www.youtube.com/watch?v=cxKphN8iVHE

Questions?

Please submit any written questions through the GoToWebinar panel on the right side of your screen, and we will answer as many as possible.

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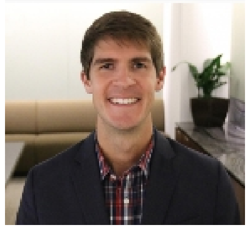
Panelist discussion



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Thank You

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Additional questions? Email Isabel@dgardiner.com

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