

# Solar Means Business

Tracking Corporate Solar Adoption in the U.S.



# About SEIA

- Founded in 1974
- 1,000 member companies from all 50 states
- **Our mission:** build a strong solar industry to power America
- **Our goal:** 100 gigawatts of solar capacity by 2022



# About this Report

- Solar Means Business tracks **solar adoption by companies at U.S. facilities**
  - The report focuses on America's largest companies, but includes available data for companies of all sizes
  - Report covers **systems installed by the end of 2017**
- **6th annual edition** of this report
- This report does not represent a comprehensive look at all commercial solar activity in the U.S. Instead, it **focuses on on-site solar installations** at the country's largest and most recognizable companies
  - Report based on **system-level data for nearly 7,400 systems**
  - Data in this report captures roughly 22% of all 2017 commercial solar activity
  - Report **does not include data for most off-site solar installations**, which have grown in number in recent years (31 currently in operation according to GTM Research). The multi-party nature of many of these projects makes it difficult to assign project specifics (solar capacity amounts, environmental attributes, etc.) to certain companies.
- Data comes from a variety of sources:
  - Directly from the system owners
  - From installers, with permission of system owners
  - From publicly available data sources such as state regulatory bodies
- All data in this report can be cited to SEIA *Solar Means Business 2017* , unless otherwise noted



# Key Findings

- Each of the top 3 companies held on to their [2016 positions](#), but each with significant additions
  - **Target:** 203.5 megawatts (MW) (up from 147.5 MW in 2016 report)
  - **Walmart:** 149.4 MW (up from 145 MW in 2016 report)
  - **Prologis:** 120.7 MW (up from 108 MW in 2016 report)
- 2017 was the 3<sup>rd</sup>-largest year for installations by America's top companies, with **325 MW installed**. Growth was led primarily by falling costs and changes to incentive programs in key states.
  - 2017 grew 2% over 2016, and 43% over 2015



# Key Findings



- Solar Means Business database has expanded as installations grow, companies take greater interest in making data available and research methods improve
  - Now tracking **2,562 MW** of commercial projects across nearly **7,400 project sites** and representing **more than 4,000 companies**
  - Up from 1,092 MW and 1,947 project sites in 2016 report
- The systems tracked in this report generate **3.2 million megawatt hours of electricity** each year, enough to **power 402,000 homes** and offset 2.4 million metric tons of CO2 annually
- While commercial adoption has increased generally, we are seeing increasing procurement of large off-site projects (not tracked in this report). These projects allow companies to offset a bigger portion of their electricity use- which is of growing importance to tech firms like Microsoft, Apple, Facebook and Amazon Web Services



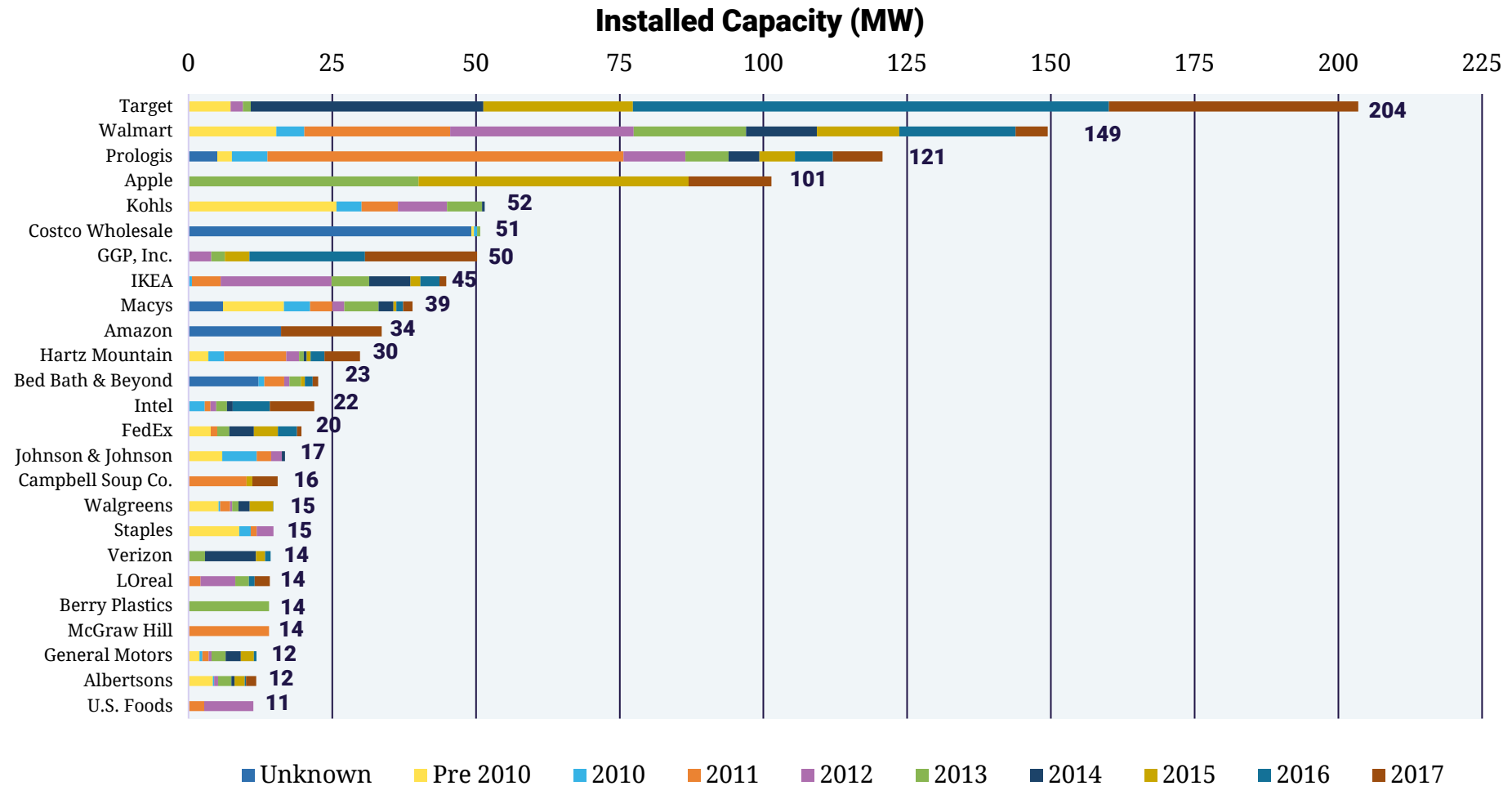
# Top Corporate Users

Tracking Solar Adoption by America's Largest Companies

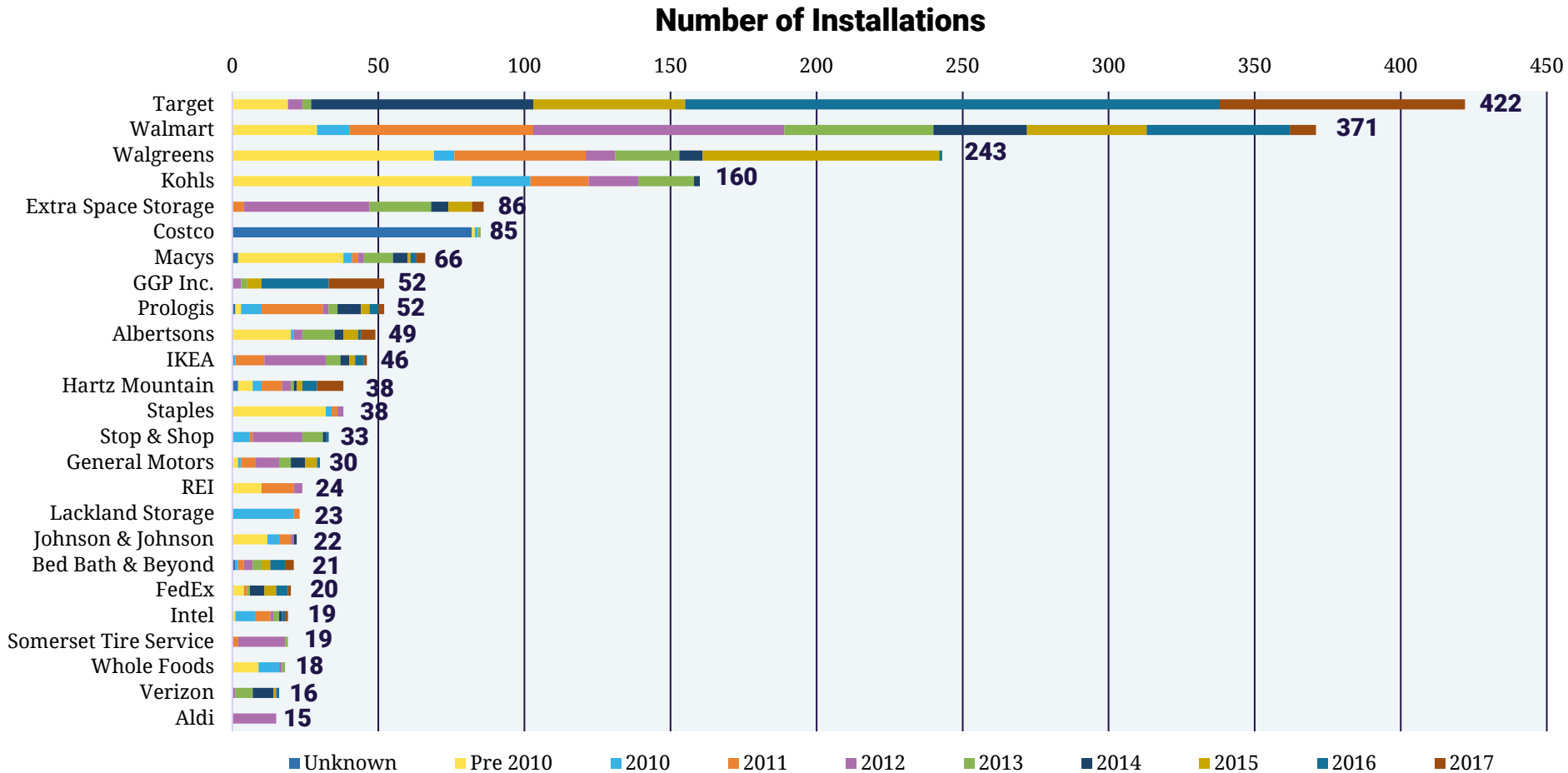


# Top 25 Corporate Users by Installed Solar Capacity

- **Target** takes the top spot for the second consecutive year
- **Walmart** has ranked 1<sup>st</sup> or 2<sup>nd</sup> 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 Users by Number of Solar Installations



- **Target and Walmart** continue to hold the top two spots for installations
- Remaining list is dominated by retailers with smaller building footprints
- **Extra Space Storage** cracks top 5 with dozens of small systems in Massachusetts, New Jersey and New York, while **Lackland Storage** makes top 20



# Company Spotlight: Target

## What's the driving force behind Target's solar procurement targets?

Making renewable energy a larger part of our electricity portfolio is a key piece of our climate strategy. In 2017, we announced our goal to power our operations by 100% renewable energy. This goal sends a strong signal to the energy sector of what Target needs to power the future of our business and for our guests. We're pleased to join other retailers and leading companies in making this pledge, and we're working with our peers and utilities to make this goal a reality.

## What benefits do you see from your solar projects?

Rooftop solar projects have a strong financial case, as they help us manage our energy expenses. Since 2013, Target has worked to be a leading solar installer among retailers. These projects allow us to reduce our energy consumption on our utility bills, and they ease demands on the local grid. In some cases, Target may generate the solar energy in support of utility and state clean energy programs and policies, and in those instances, we do not retain the renewable energy credits.

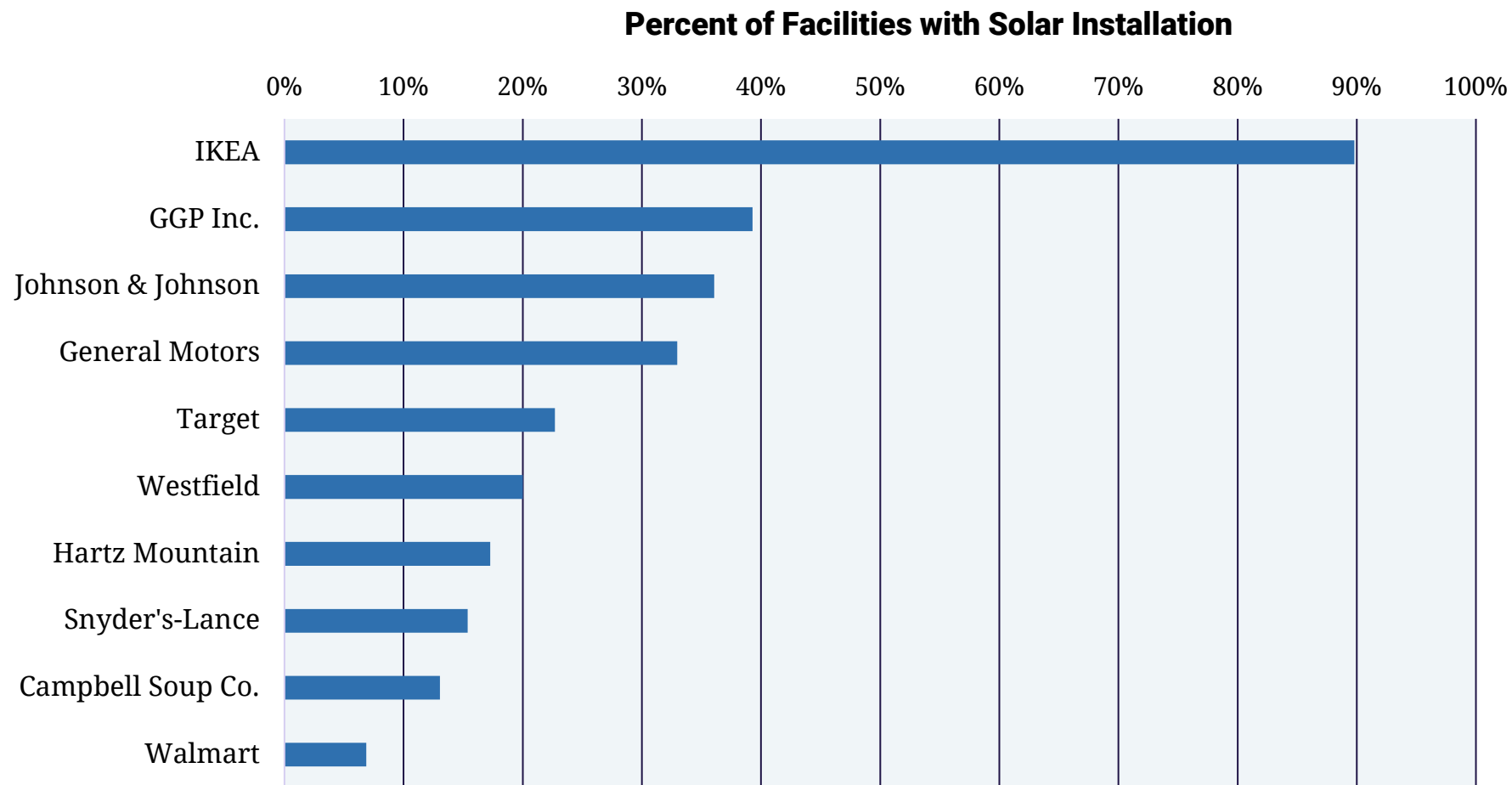
## What are your future solar plans?

By 2020 over 500 Target locations will have rooftop solar systems, each of which may have the potential to produce up to one-third of a location's electricity needs. Today, 436 of our locations have rooftop solar. On emerging trends in energy innovation, we see energy storage as an integral tool to increasing our renewable energy consumption and improving resiliency at stores in climate-impacted communities.

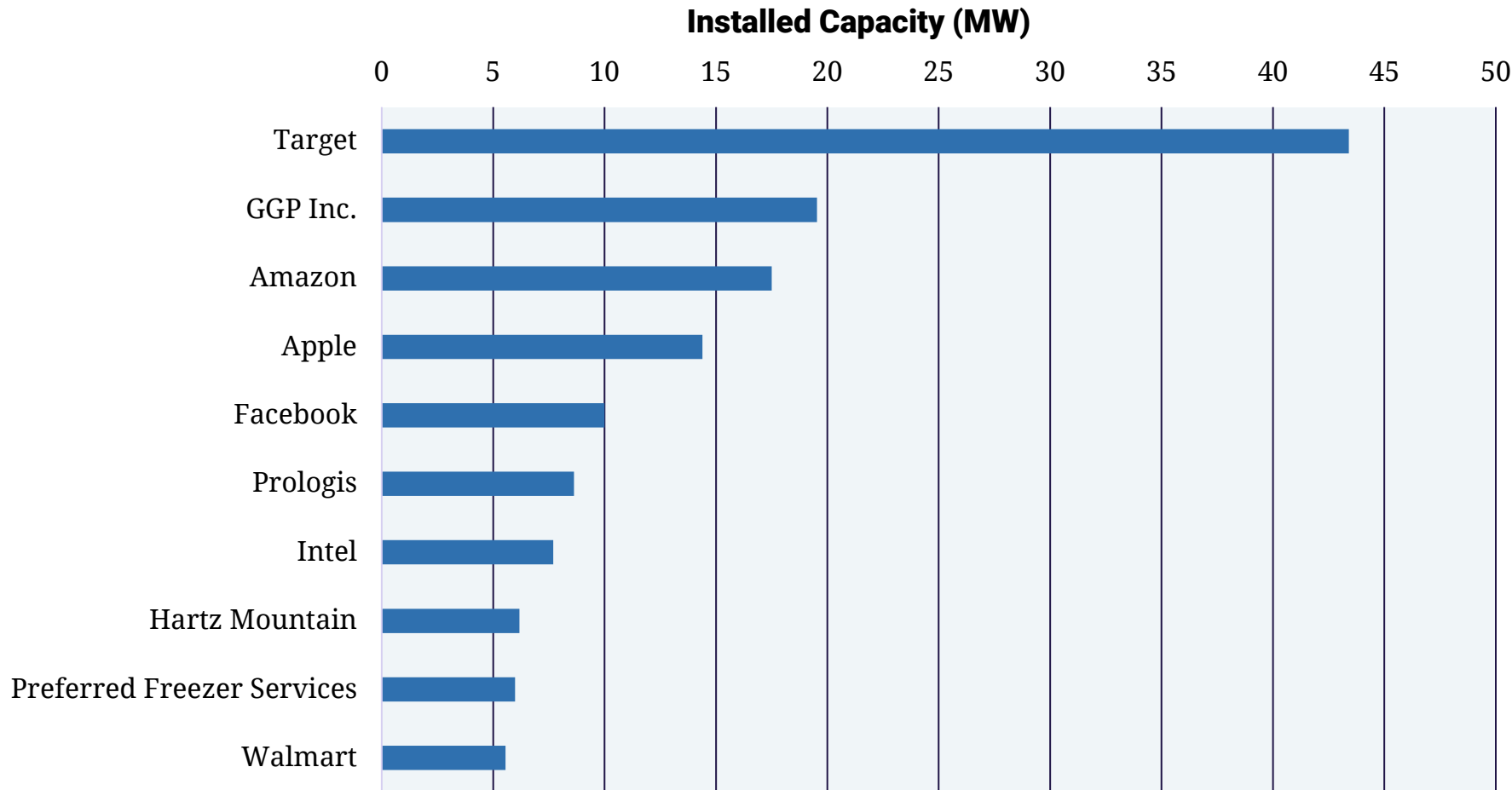


# Top 10 Corporate Users by Percentage of Facilities with Solar

- **IKEA** takes top spot for the 6<sup>th</sup> consecutive year
- **GGP Inc.** moves up two spots after adding solar to 42 of their properties over the last two years
- Despite having over 1,800 and 5,400 facilities respectively, **Target** and **Walmart** each make the top 10
- **Hartz Mountain** added solar to 14 of their properties in 2016 and 2016 to maintain the 7<sup>th</sup> spot in the list



# Top 10 Corporate Users by 2017 Installed Solar Capacity



- **Target** completed over 43 MW of solar projects in 2017, more than doubling that of runner-up **GGP Inc.**
- List newcomer **Amazon** installed at least 17.5 MW of projects in 2017 (separate from Amazon Web Services off-site projects)
- Tech firms **Apple** and **Facebook** round out the top 5, with Apple's install powering their headquarters in Cupertino and Facebook's powering data centers in [New Mexico](#).

# Top 10 Corporate Solar Users – Fun Facts

## #1

Target added more than 40 MW of solar in 2017 - more than 23 U.S. states and any other U.S. retailer

## #2

Every week, 9.6 million people, or roughly 3% of the U.S. population, visits a solar-powered Walmart

## #3

Prologis has installed more solar capacity than 21 U.S. states and plans to have 200 MW of solar installed by 2020

## #4

Apple's solar facilities produce enough electricity annually to fully charge more than 44 million iPhones every day for a year

## #5

More than 19,300 Americans work at a solar-powered Kohl's

## #6

Every year, more than 11 million hot dogs are sold at solar-powered Costcos

## #7

Since 2011, General Growth Properties has reduced their grid-purchased electricity consumption by more than 267.9 million kilowatt-hours, enough energy to power all of the homes in Napa, CA for one year

## #8

Every day, more than 60,200 Swedish meatballs are sold at solar-powered IKEA stores across the U.S.

## #9

Macy's has installed enough solar capacity to power more than 1.7 million televisions during their annual Thanksgiving Day Parade

## #10

Amazon's solar installations generate enough electricity to power more than 1.4 million Echo Dots every year

For sources and references, see page 26

# Solar Means Business Coast to Coast

## Corporate Solar Installations by Facility Type

- Retail
- Data Center
- Distribution
- Self Storage
- Office
- Manufacturing / R&D
- Hotel / Event / Conference Center
- Other

To explore the full map, visit [seia.org/solarmeansbiz](http://seia.org/solarmeansbiz)

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**Solar Means Business** 

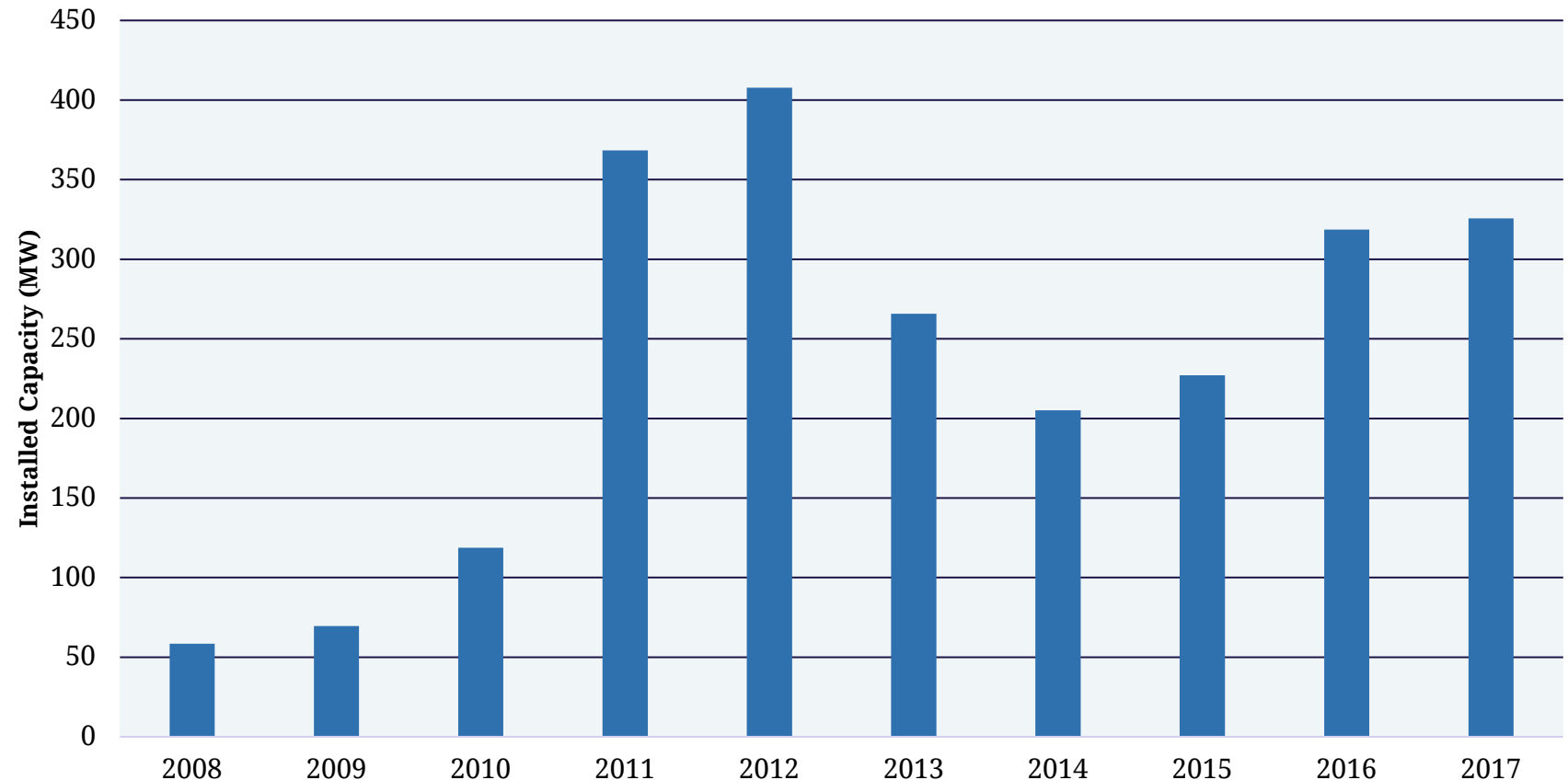
# Trends in Corporate Solar Procurement



# Corporate Installations Have Grown in Recent Years

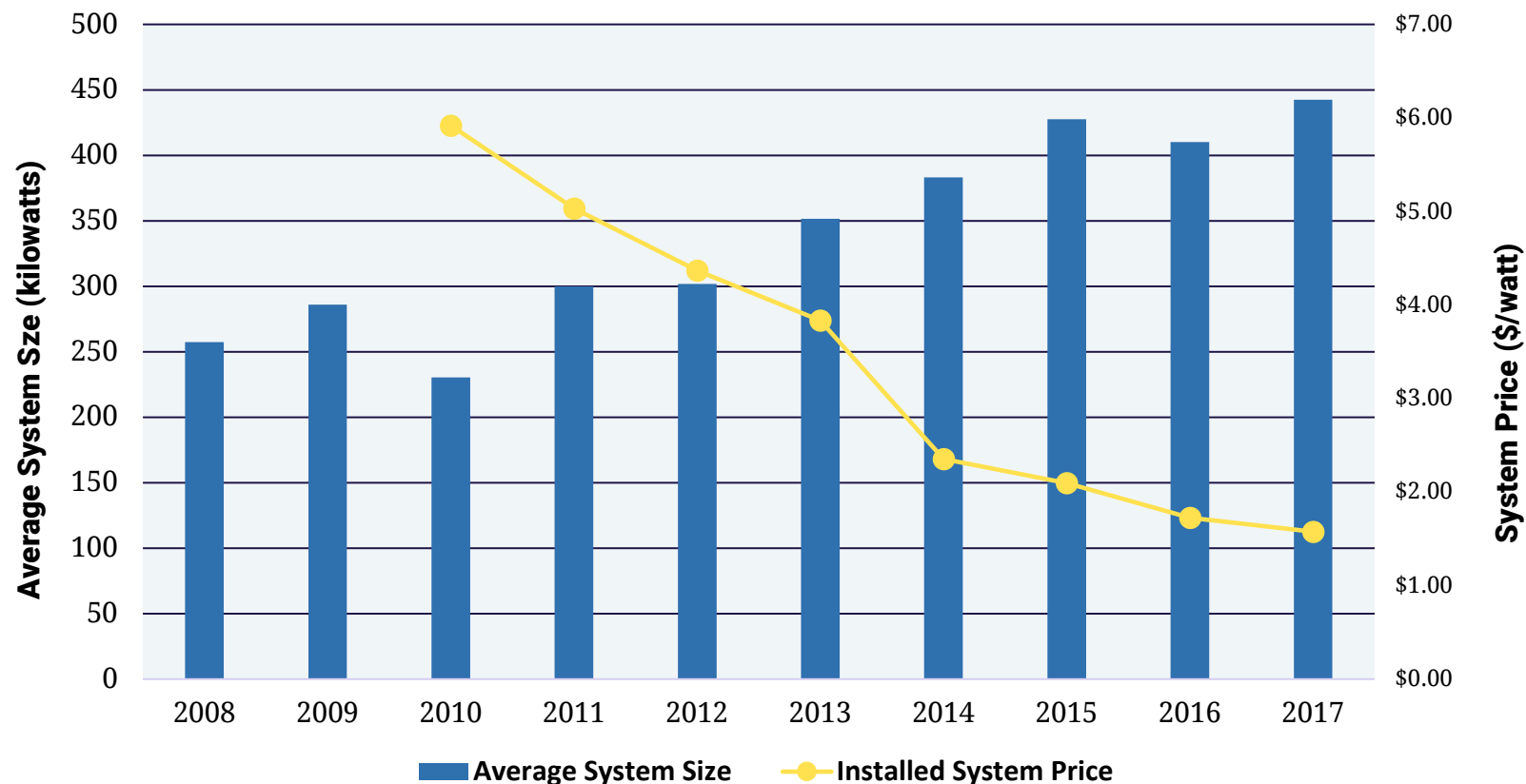
- Solar Means Business doesn't represent all commercial solar installations, instead focusing on on-site projects at the largest companies
- **326 MW were installed** by Solar Means Business companies in 2017, representing 2% growth from 2016 and marking the third-largest year.
- Recent installations **driven by declining prices**, related increase in average system size, and changes to incentive programs in [Massachusetts](#) and [California](#)
- Surge of installations in 2011 and 2012 based around expiring/declining incentives in specific state markets

Annual Solar PV Installations by Solar Means Business Companies



# System Size Increasing as Prices Fall

Solar Means Business Average Annual System Size



Sources: SEIA Solar Means Business 2017;  
SEIA/GTM Research U.S. Solar Market Insight

- Average system size for SMB projects has grown consistently over the last decade, **reaching 443 kW in 2017**
- This growth is led by two factors:
  - Continued declines in commercial system pricing; **prices have fallen by 73% since 2010**
  - Growth in use of [Power Purchase Agreements](#), allowing more corporate to install larger systems with lower financing costs
- This analysis does not include most off-site corporate projects, most of which are large scale projects which would push average system sizes higher



# Company Spotlight: Campbell Soup Company

## What's the driving force behind Campbell Soup Company's solar procurement targets?

Campbell Soup Company has a long-standing sustainable business strategy that contributes to our bottom-line, to the communities in which we work, and to the expectations of our consumers. Part of that strategy is a renewable energy program which enables Campbell to contribute to the clean energy economy as part of its climate protection efforts, while also driving cost savings for the company.

## What benefits do you see from your solar projects ?

Each of Campbell's solar projects contribute to our long-term economic viability and the strength of the regional power supply. Campbell's renewable projects are delivering clean energy to the grid and demonstrating the viability of energy sources like solar. Our Camden, NJ., installation which recently came online, will generate more than 5 million kilowatt hours of electricity per year, or the equivalent of approximately 20 percent of the annual electricity usage of Campbell's World Headquarters. The project joins four existing renewable energy projects at Campbell facilities in the U.S.: a 9.8 MW solar array in Napoleon, Ohio; a 1 MW solar array in Bloomfield, Conn.; and a 1.2 MW fuel cell and 1.4 MW fuel cell in Bloomfield, Conn. In total, these projects contribute more than 27,000 MWh of renewable energy to the grid annually.

## What are your future solar plans?

Campbell continues to explore viable projects throughout our network, including virtual PPAs that would open up new opportunities for greater environmental impact.

## Any advice to companies starting out?

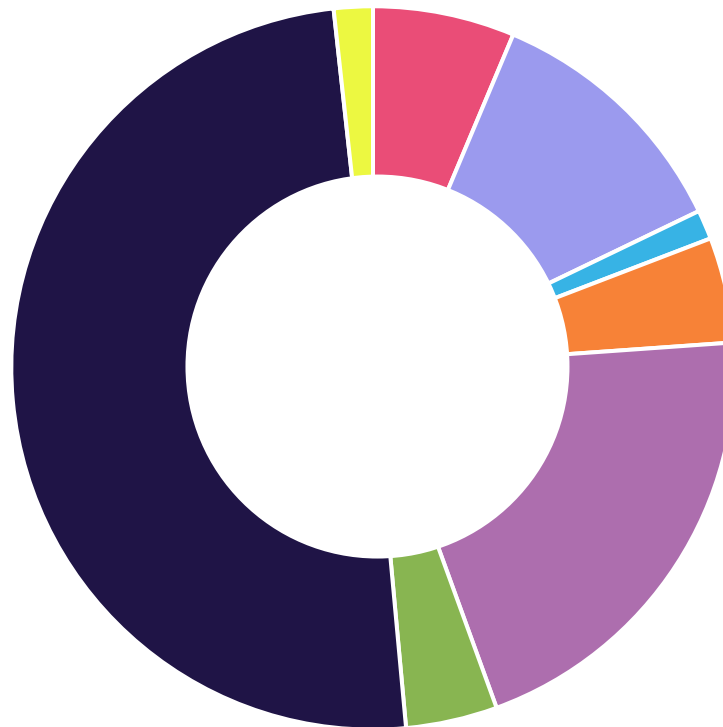
When starting out, explore markets that incentivize the creation of solar projects to make a clear business case for projects that are unfamiliar to the organization. This will help gain executive buy-in for the future.



# Retail Continues to be Dominant Facility Type

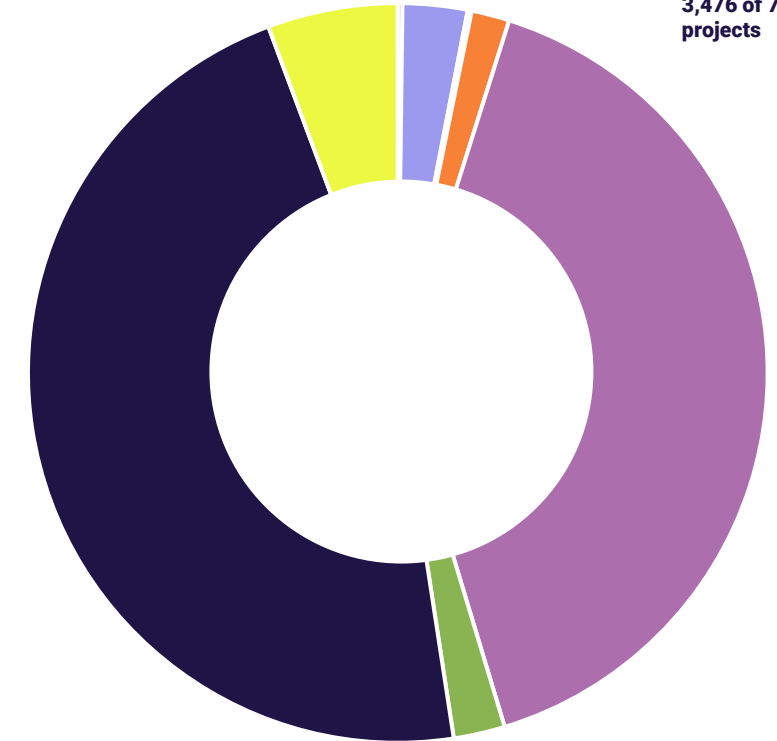
## Solar Means Business Solar Capacity by Facility Type

- Data Center
- Distribution
- Hotel/Event/Conference Center
- Manufacturing/R&D
- Office
- Other
- Retail
- Self-Storage



## Solar Means Business Installations by Facility Type

- Data Center
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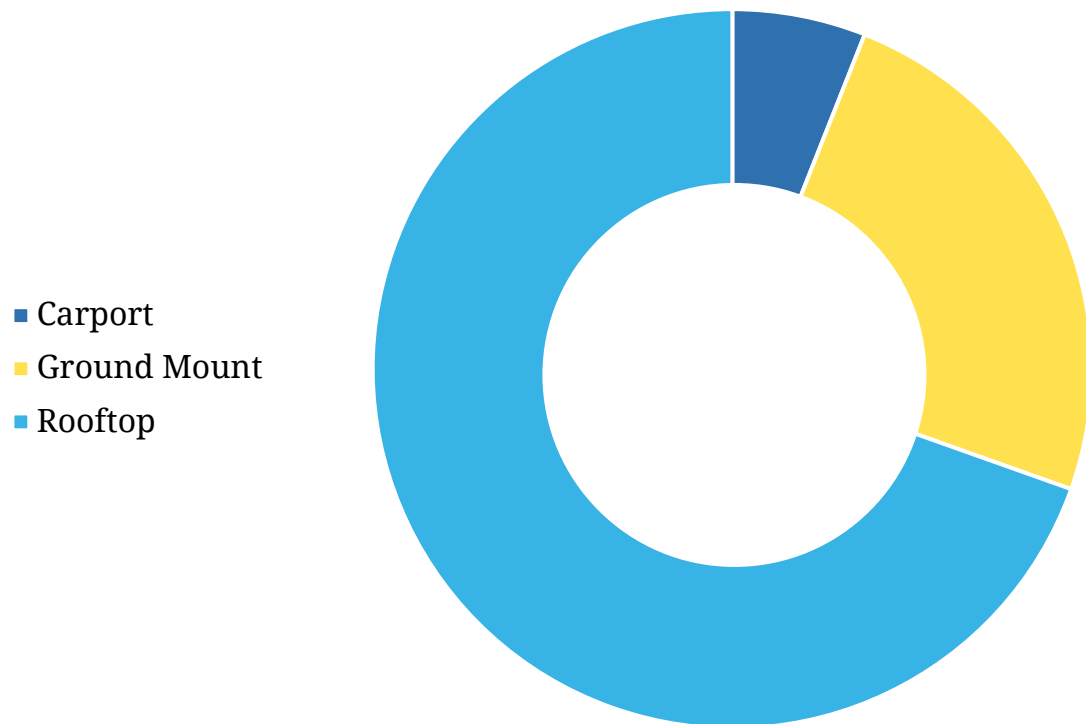


Note: Facility Type data only available for 3,476 of 7,478 projects

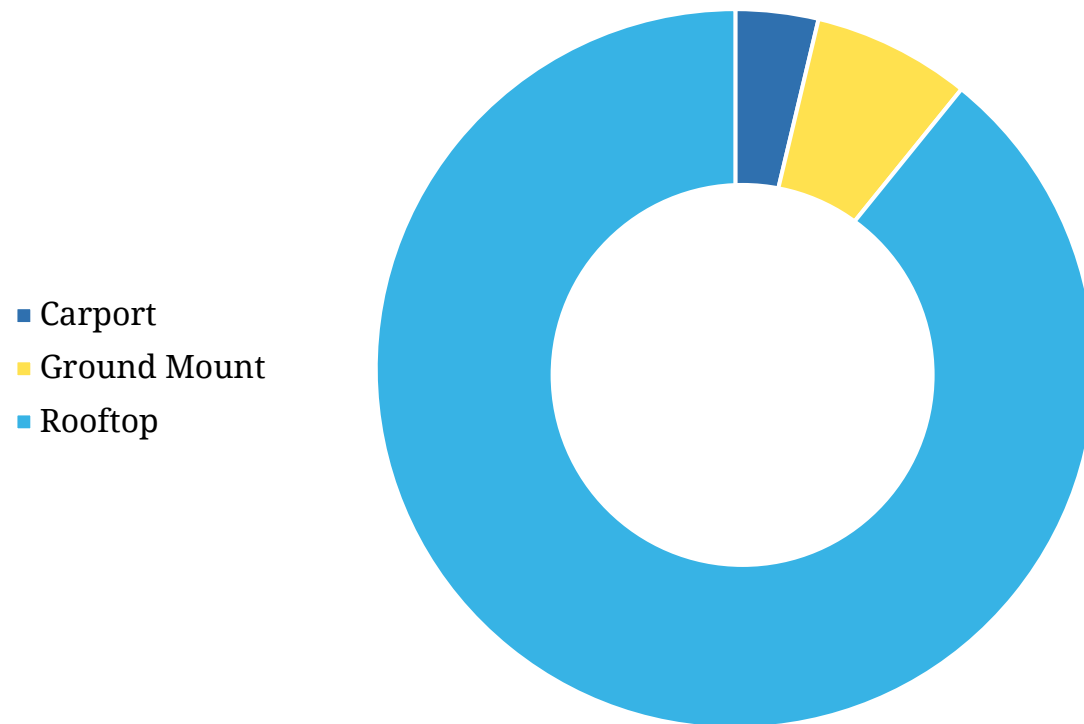
Retail sites continue to constitute the largest share of SMB solar projects, both in terms of capacity and installations. Though installations at large retail centers like Target and Walmart are included in retail, the bulk of the list is made up of retailers with smaller building footprints. Installations at office buildings tend to be smaller, leading to disparity within that category between capacity and installations. 2016 and 2017 saw **rapid growth in installations at Self-Storage facilities**, which can make use of large building footprints and flat roofs.

# Most Corporate Systems are Rooftop

## Solar Means Business Capacity by Mounting Type



## Solar Means Business Installations by Mounting Type

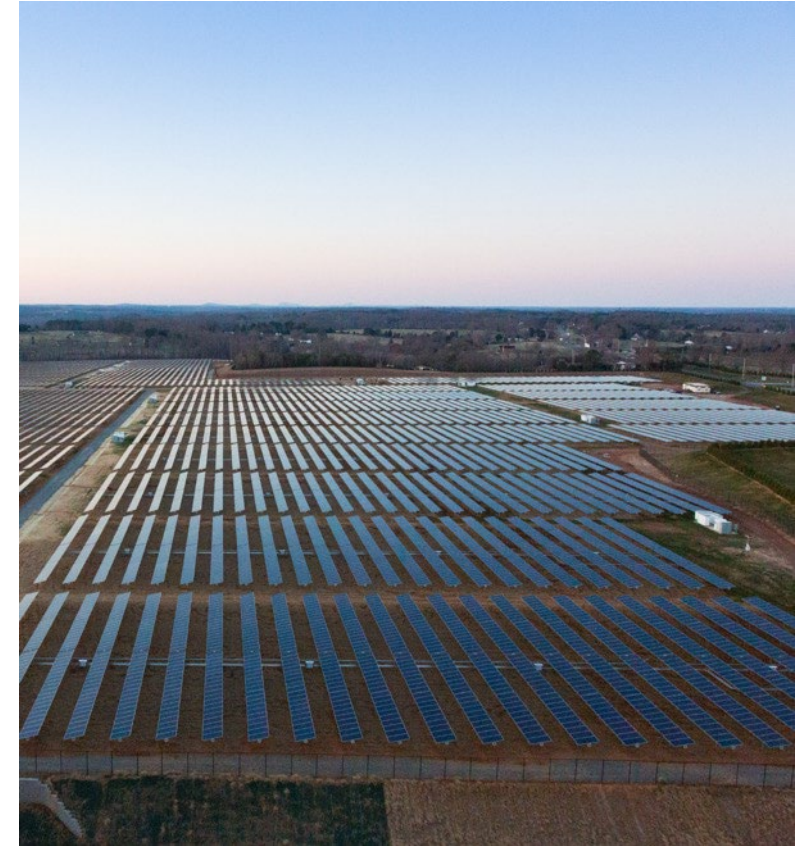


Note: Mounting Type data only available for 2,107 of 7,478 projects

Rooftop systems continue to make up the majority of the Solar Means Business database, **constituting 70% of capacity** and 89% of all installations. Unsurprisingly, ground mount systems tend to have larger system capacities than rooftop, leading to the disparity between ground mount capacity and installations.

# Growth of Off-site Corporate Procurement

- While not explicitly tracked in this report, off-site corporate procurement has been a major driver of corporate solar installations in recent years
  - GTM Research counts **31 operating off-site corporate projects** plus 21 in development
  - Projects of this type include 56 MW of off-site solar procured by **Walmart** as part of a recently-completed 72 MW project owned by utility Alabama Power
- These projects allow companies to tap into economies of scale by siting projects in areas where larger system sizes are possible
- Projects also benefit from multi-party financial arrangements in which multiple companies buy a share of the generation from a single project
  - Enabled by physical PPAs (in which the corporate buys and takes legal title for the electricity from a system) and virtual PPAs (in which a corporate doesn't directly take title to the electricity from the system, but the revenue stream from the sale of that electricity on the open market)
- Tech companies have taken interest in off-site solar to offset electricity demand from their data centers:
  - **Facebook**: Contracted for three 10 MW projects in New Mexico
  - **Amazon Web Services**: Contracted for 260 MW of solar in Virginia
  - **Microsoft**: Will purchase 315 MW from two solar facilities in Virginia
- Off-site procurement is expected to continue to grow as both solar developers and corporates become more familiar with the transaction.



# Company Spotlight: Microsoft

## What's the driving force behind Microsoft's solar procurement targets?

As Microsoft continues to build a global cloud to better serve our customers, we're using more energy - already we use nearly as much electrical power as a small American state. To sustainably address these needs, we're procuring [increasing amounts](#) of solar electricity (and other forms of renewable energy) to meet our next clean energy milestone: 60% renewable energy for our datacenters by 2020.

## What benefits do you see from your solar projects?

Our latest, and largest, solar agreement with sPower in Virginia represents the largest corporate purchase of solar energy in the United States to date in a state that's critical to the advancement of clean energy in the U.S. We're optimistic about the future of solar, and other clean power sources, and are working with our partners and utilities to leverage our buying power to help bring more clean energy onto the grid in areas where we operate around the world.

## What are your future solar plans?

Microsoft plans to continue to expand our renewable energy portfolio, including solar power, until our datacenters run entirely on renewable energy. We're also using more solar to power our offices, such as in Silicon Valley and recently in [India](#).

## Any advice to companies starting out?

Look for projects like our recent deal with sPower in Virginia, where there is a larger anchor tenant buying most of the energy, and invest in those. The anchor tenant will secure the deal and reduced both risk and price for the developer, allowing them to sell the project's remaining clean power at a more affordable price.

## Anything else you'd like to add?

Our latest solar [deal with sPower](#) ensure the development of two new solar projects in Virginia, Pleinmont I & II, that will also avoid more than 500,000 metric tons of carbon dioxide equivalent – that's akin to cutting the greenhouse gas emissions of 110,000 passenger cars a year –and will produce 715,000 MWh/year.



# Microsoft



# The Bigger Picture

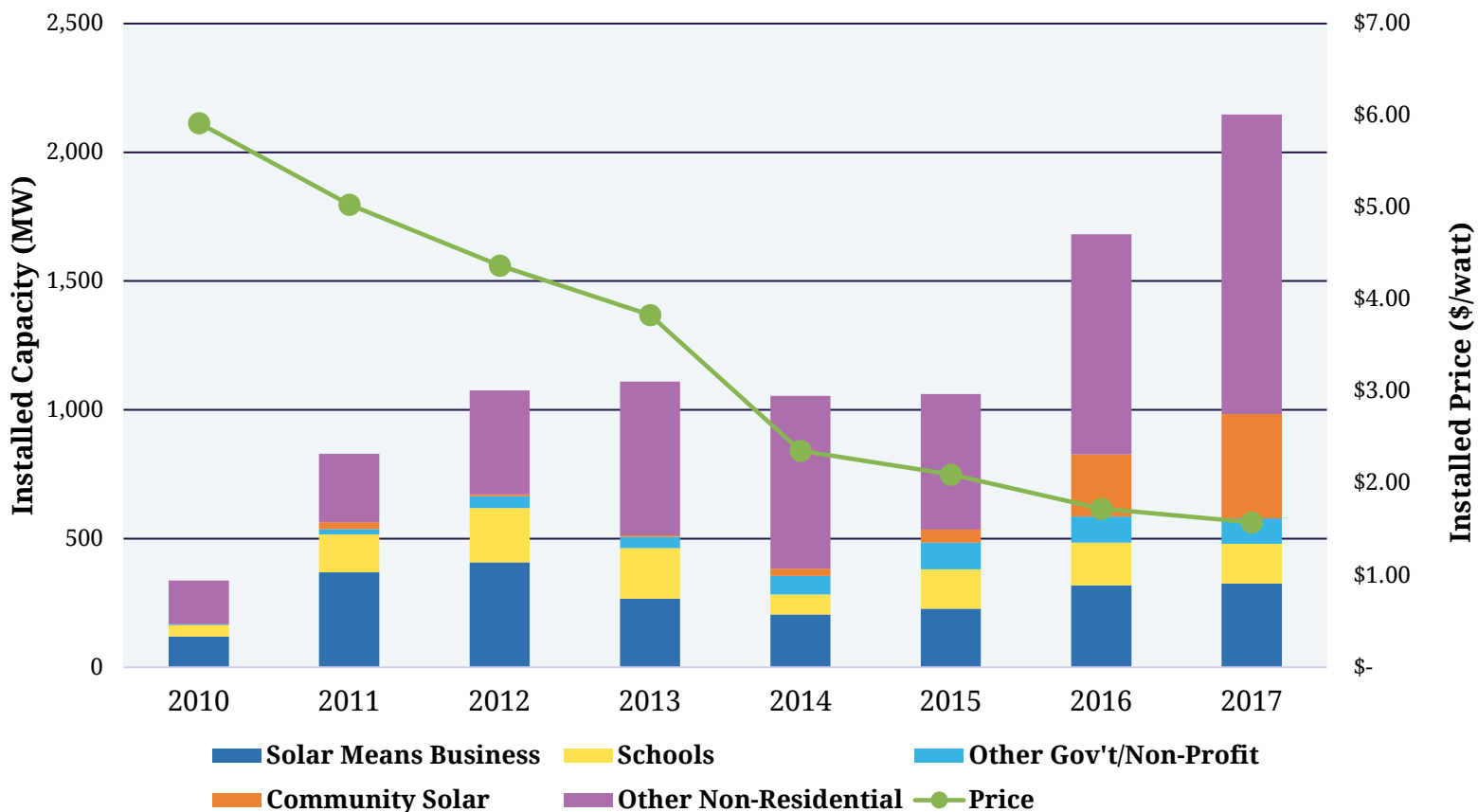
Corporate Solar Installations in a Dynamic Marketplace



# Solar Means Business in Perspective

- As noted, this report is not a comprehensive look at U.S. commercial solar, but at on-site solar adoption by America's largest companies
- SEIA/GTM Research tracks non-residential solar in aggregate in our [Solar Market Insight](#) report series. In that report non-residential is defined to include commercial, school, government, non-profit and community solar installations
- In 2017, data from **Solar Means Business** represented **15% of all non-residential installations**, and close to a quarter of all commercial installs.
- Historically, the non-residential segment has been led by commercial installs; in recent years community solar has grabbed a larger share
- Commercial market growth in 2016 and 2017 owed to three factors
  - Declining prices
  - Demand pull in from potential [ITC expiration](#) and expiring incentives in key state markets
  - Growth of financing opportunities (PPAs, Contracts for Difference, off-site arrangements, [Commercial PACE](#))

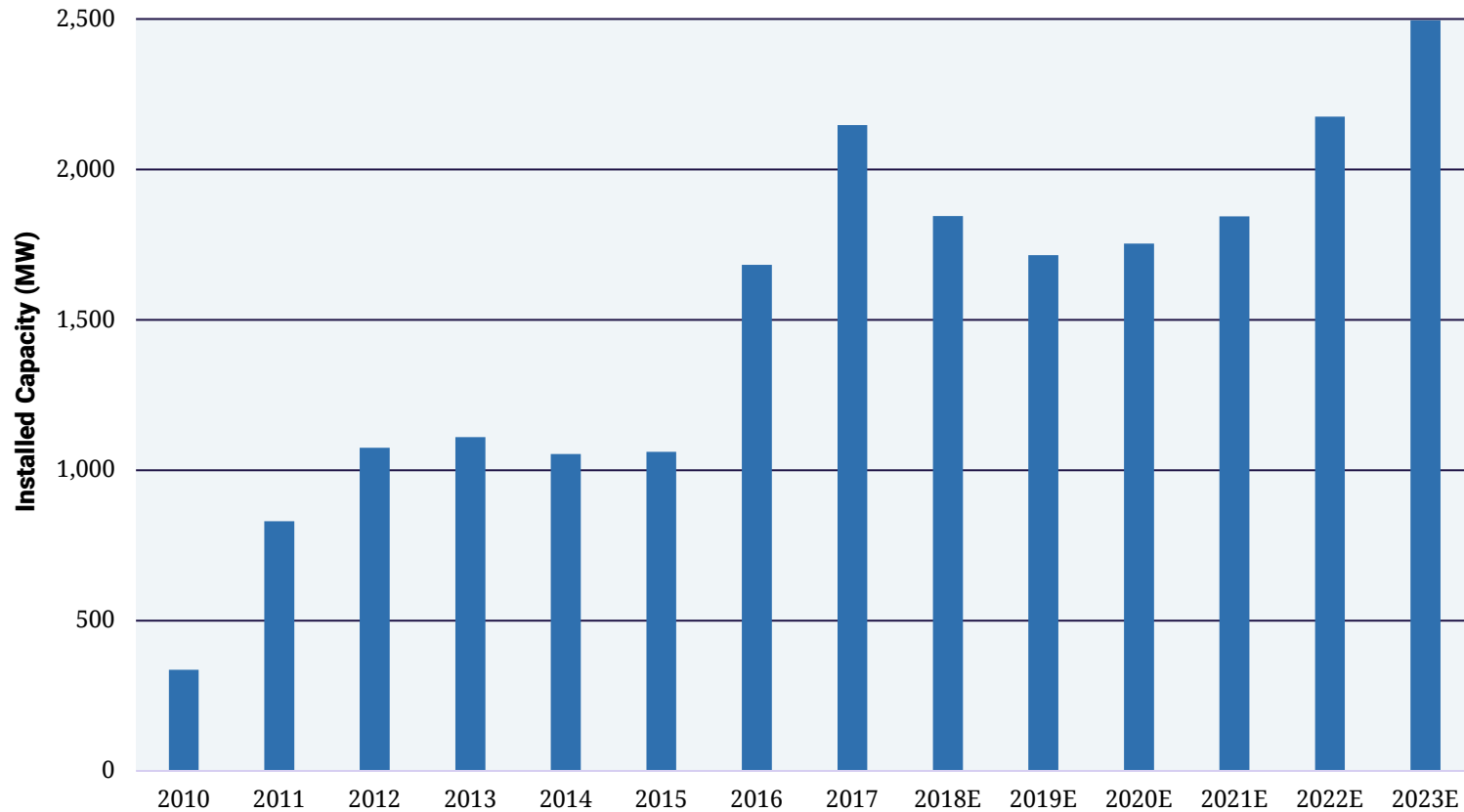
## Non-Residential Solar PV Installations by Project Type



Sources: SEIA Solar Means Business 2017; SEIA/GTM Research U.S. Solar Market Insight

# Looking Forward

## Non-Residential Installations



Source: SEIA/GTM Research U.S. Solar Market Insight

- Commercial installations are expected to decline in 2018 as incentive regimes change in [Massachusetts](#) and [California](#) moves to less favorable TOU rates for commercial solar customers
- From 2018 – 2020 commercial installations will be **slowed due to [impact of solar module tariffs](#)**.
- Past 2020, tariffs will decline, likely leading to a drop in system prices.
- At the same time, the [Investment Tax Credit](#) will be declining from 30% to 26% in 2020, 22% in 2021 and then 10% in 2022. **Growth from 2021 – 2023 will be led by developers using commence construction rules to monetize higher ITC levels**, coupled with lower system prices from the elimination of tariffs



# 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

# Sources and Acknowledgements

## Sources for Top 10 Company Facts

1. Target; SEIA/GTM Research *U.S. Solar Market Insight*
2. Calculation based on data from <https://www.nytimes.com/2017/08/16/business/walmarts-ceo-had-plenty-to-say-about-trump-so-did-his-customers.html>
3. SEIA/GTM Research *U.S. Solar Market Insight* and <https://www.prologis.com/about/sustainable-industrial-real-estate/environmental-stewardship>
4. Calculation based on electricity use needed to charge iPhone 6, from <https://blog.opower.com/2014/09/iphone-6-charging-47-cents/> and SEIA solar PV system production assumptions using TMY3 data [http://rredc.nrel.gov/solar/old\\_data/nsrdb/1991-2005/tmy3/](http://rredc.nrel.gov/solar/old_data/nsrdb/1991-2005/tmy3/)
5. Calculation based on data from Kohl's Q1 2016 Fact Book
6. Calculations based on <http://www.businessinsider.com/costco-hot-dog-combo-coke-pepsi-2013-2>
7. Calculations based on <http://sustainability.ggp.com/year-2016/default.aspx>
8. Calculation based on <https://www.wsj.com/articles/ikea8217s-path-to-selling-150-million-meatballs-1381967800>
9. Calculation based on <https://www.usatoday.com/story/news/nation-now/2017/11/22/macys-thanksgiving-day-parade-what-you-need-know/889671001/>, <http://energyusecalculator.com/> and SEIA solar PV system production assumptions using TMY3 data [http://rredc.nrel.gov/solar/old\\_data/nsrdb/1991-2005/tmy3/](http://rredc.nrel.gov/solar/old_data/nsrdb/1991-2005/tmy3/)
10. Calculation based on <https://www.esource.com/es-blog-2-17-17-voice-control/ok-google-how-much-energy-does-alexa-consume> and SEIA solar PV system production assumptions using TMY3 data [http://rredc.nrel.gov/solar/old\\_data/nsrdb/1991-2005/tmy3/](http://rredc.nrel.gov/solar/old_data/nsrdb/1991-2005/tmy3/)

Many thanks to the following solar developers for submitting data for this report:





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