



Charting the Emergence of Corporate Procurement of Utility-Scale PV Webinar

NREL Webinar
October 9, 2017

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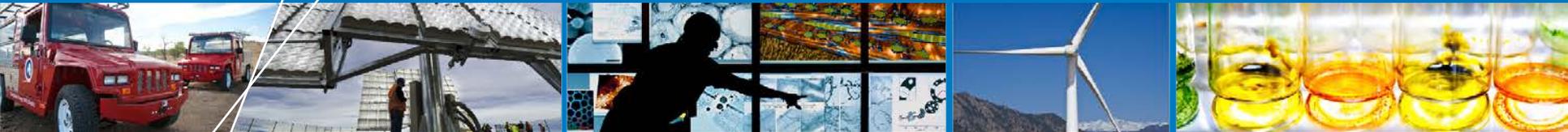
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Webinar Structure

- **Overview of key report findings**
 - Jenny Heeter (NREL)
- **What corporations want and how to get there**
 - Kevin Hagen (Iron Mountain)
- **Serving the corporate market**
 - Garrett Sprague (CustomerFirst Renewables)
- **Serving the corporate market**
 - Stan Blackwell (Dominion Virginia)
- **Overseeing the corporate market**
 - Jennifer Snyder (Regulatory Analyst)
- **Q&A**

Charting the Emergence of Corporate Procurement of Utility-Scale PV



**Jenny Heeter, Senior Energy
Analyst at National
Renewable Energy
Laboratory**

Overview

1. Purchasing Models:

- Off-site Solar PPAs
- Retail Choice
- Utility Partnerships: Green Tariffs and Bilateral Contracts
- FERC Authorized Wholesale Seller of Electricity

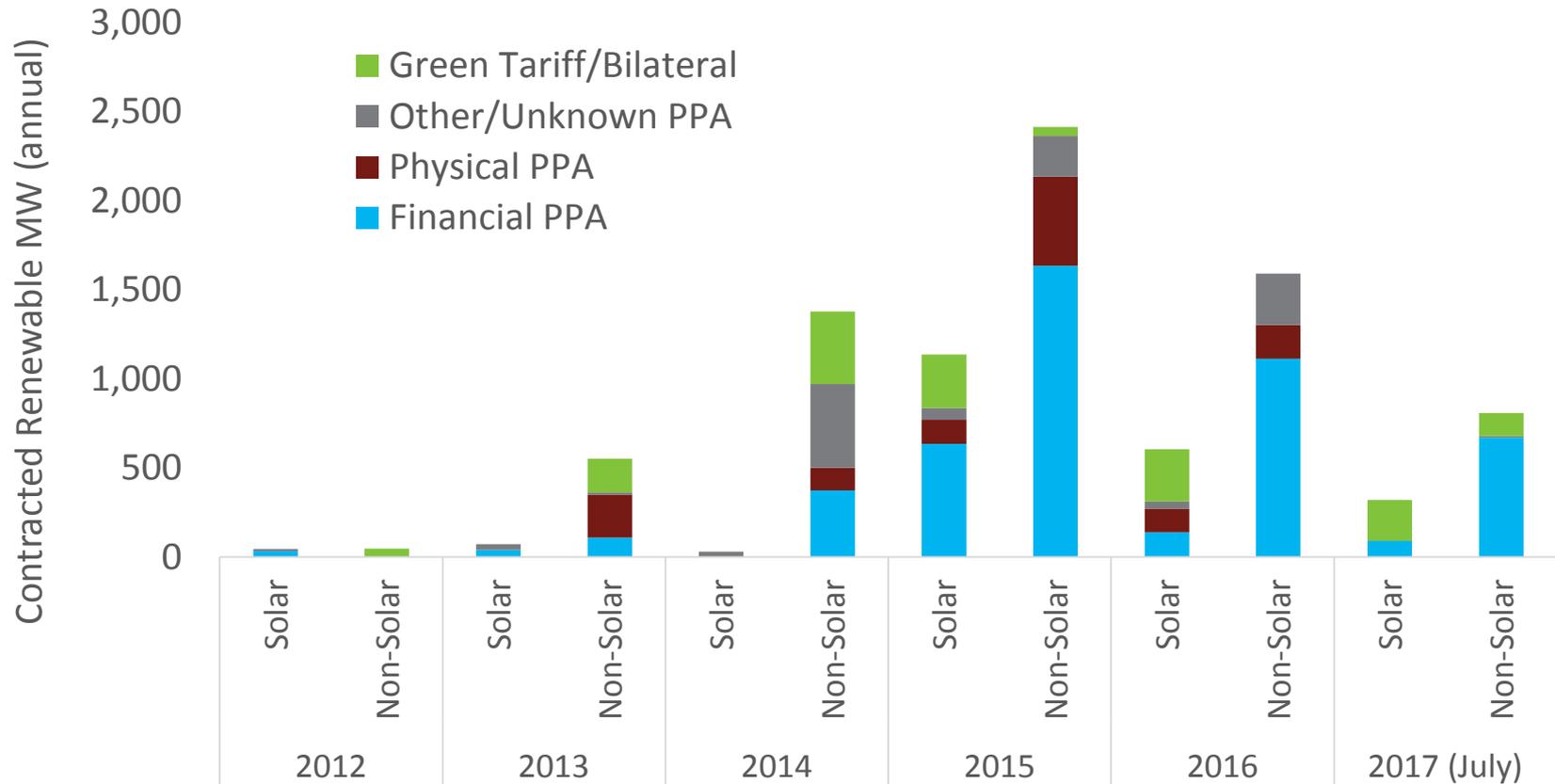
2. Market Status

3. Comparison

Corporate Purchasing Models

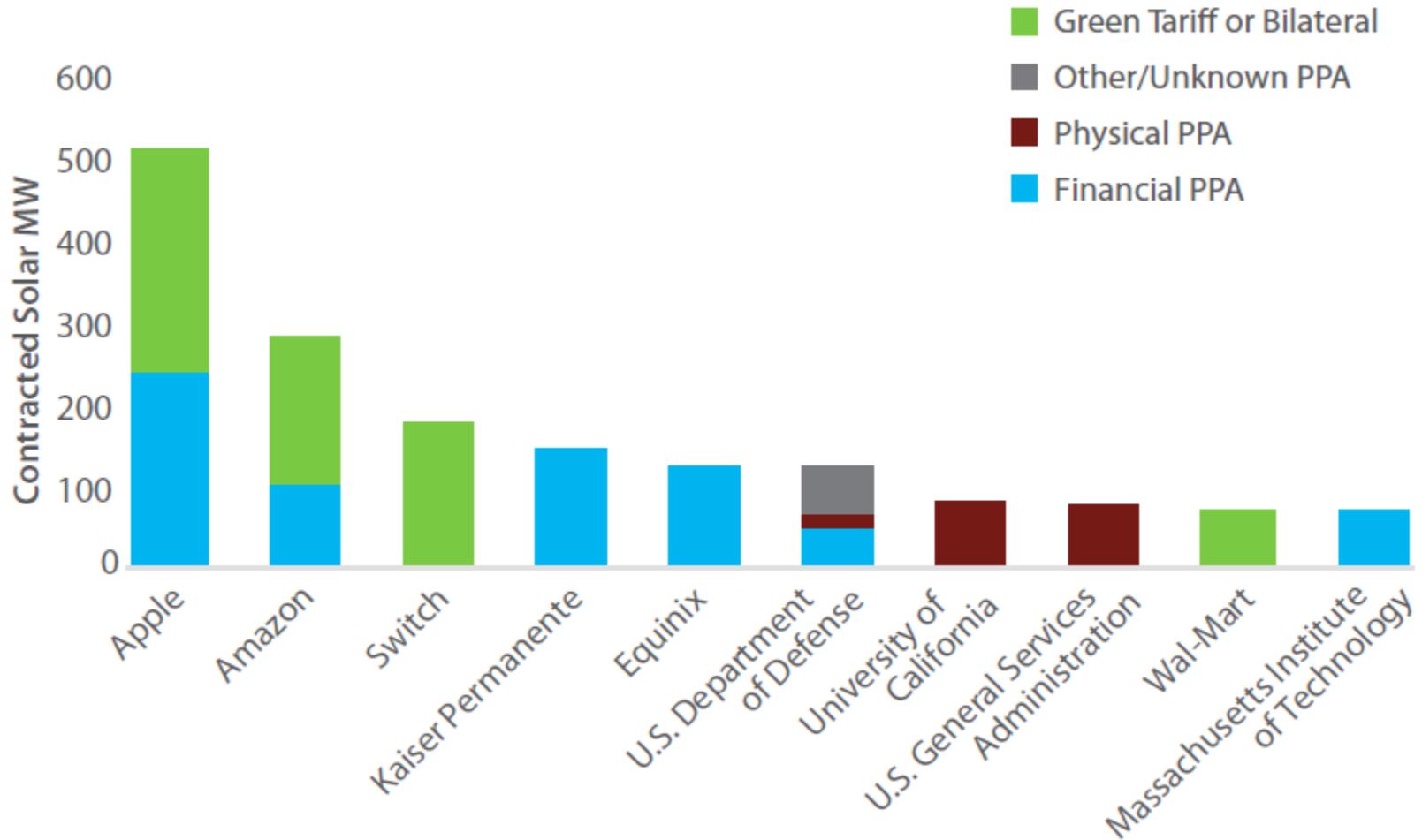
- **Power purchase agreements (PPAs):** Through the use of a PPA, a corporate customer can sign a long-term contract with a developer to secure physical or virtual rights to electricity generation and the environmental attributes of a project.
- **Retail choice:** In states that allow retail choice, a corporate customer has the opportunity to purchase electricity from a competitive supplier on a short-term or long-term basis.
- **Utility partnerships:** Some utility service territories offer green tariff options that allow a corporation to enter into an agreement with their utility to procure renewable energy from a utility-owned or managed project with an established long-term rate; other utilities have established bilateral contracts that allow similar structures but for only one customer.
- **Licensed wholesale electricity seller:** A corporation can seek authority from the Federal Energy Regulatory Commission (FERC) to buy and sell electricity on the wholesale market.

Solar Contracts Represent about 25% of all Renewable Energy Contracts, 2008-July 2017



In recent years, solar has represented about 30% of the total market for off-site corporate procurement. Solar dominates the green tariff and bilateral contract segment, at 86% and 100% in 2015 and 2016, respectively.

IT Companies are Pushing Utilities for New Solar Options

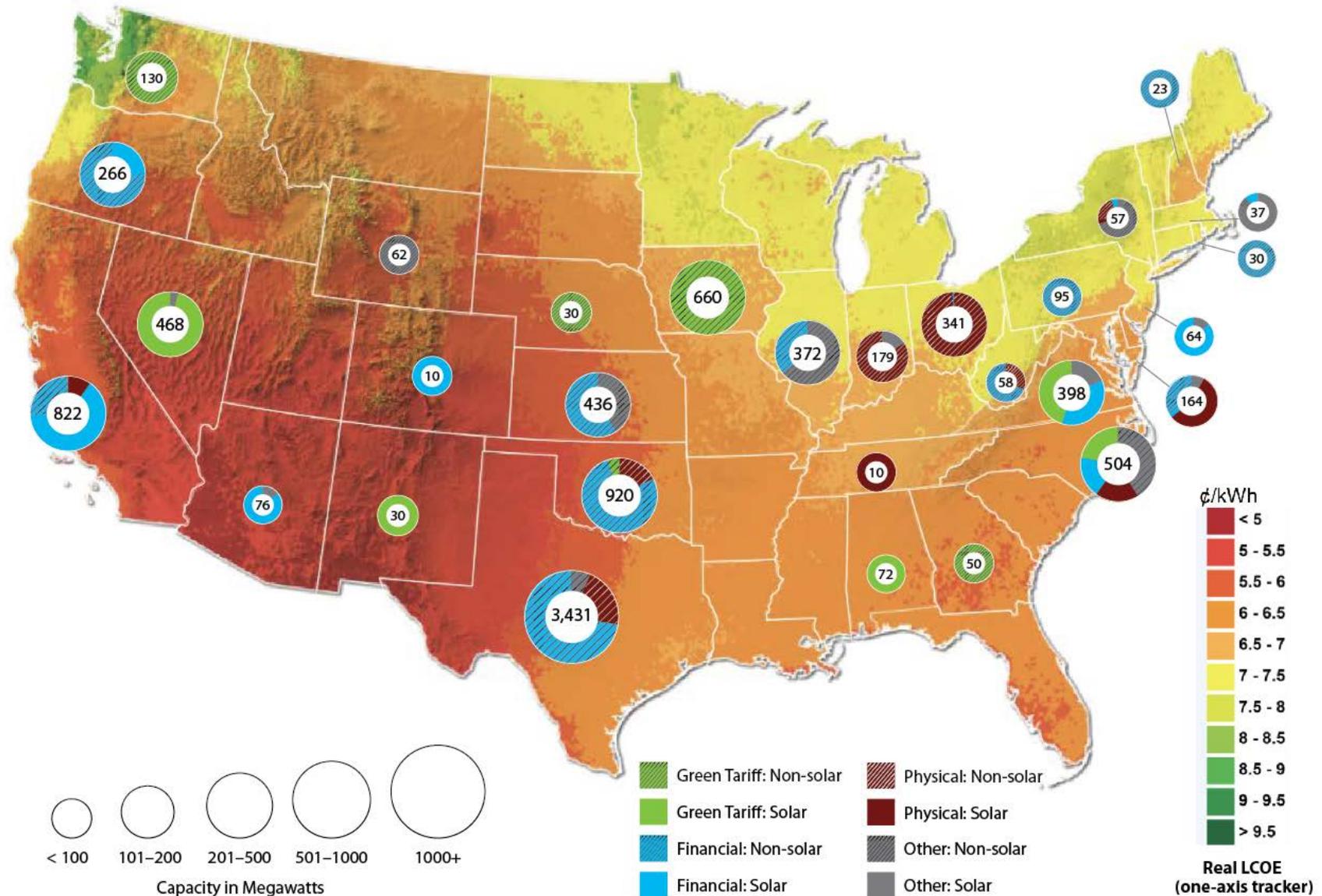


Note: Not all companies may be retaining the RECs from their purchase; where RECs are not retained, no renewable or carbon claim can be made by the company specific to that facility.

Procurement Model Comparison

	Power Purchase Agreements	Retail Choice	Utility Partnership	Licensed Wholesale Electricity Seller
Availability	Typically requires wholesale market access	Full or partial access in 21 states	Certain utility jurisdictions in 17 states	Any company that owns or has interest in owning utility-scale generation
Corporate Access	Large corporate customers, and emerging aggregation opportunities	All or certain large corporate customers, no aggregation opportunities	Certain large corporate customers and emerging aggregation opportunities	Any company, no aggregation opportunities
Energy Market Expertise and Corporate Approval Requirements	Medium–high	Medium–low	Low–low	Very high–Very high
Contract Length	10–20 years	Negotiable	Varies by utility program	Negotiable (typically longer term, 10–20 years)
Hedging Opportunity and Risk Profile	High, but subject to wholesale market hub or node price volatility	Opportunity depends on length of contract and is subject to retail market price volatility	Opportunity depends on length of contract, credit structure, and/or wholesale market price volatility	High, but subject to wholesale market hub or node price volatility

To Expand Corporate Solar Procurement, Better Purchasing Options are Needed in Areas Where Solar is Lowest Cost



Publication:

Heeter, Jenny, Jeffrey J. Cook, and Lori Bird. 2017. Charting the Emergence of Corporate Procurement of Utility-Scale Solar. NREL/TP-6A20-69080.

Golden, CO: National Renewable Energy Laboratory.

<https://www.nrel.gov/docs/fy17osti/69080.pdf>

Fact sheet:

Pathways for Off-Site Corporate PV Procurement. 2017. NREL/TP-6A20-69081. Golden, CO: National Renewable Energy Laboratory.

<https://www.nrel.gov/docs/fy17osti/69081.pdf>

Full slide deck:

<https://www.nrel.gov/docs/fy17osti/70003.pdf>

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Renewable Energy Strategy

@KevinHagen

Director Corporate Responsibility

Global leader in storing, protecting and managing critical information and assets.

- **Records Management**
 - **Data Management**
 - **Document Management**
 - **Data Centers**
 - **Art Storage**
 - **Secure Shredding**



- **\$3.8B Sales**
- **25,000 employees**
- **+1400 secure Facilities**
- **46 Countries**
- **85 Million Sq ft**
- **220,000 customers**
- **94% of FORTUNE 500**
- **Publically Traded REIT (NYSE: IRM)**
- **Listed on the DJSI**



How much we use



Use less = Pay less

When we use it



Avoid peak time
Reduce peak kW

The rate we pay

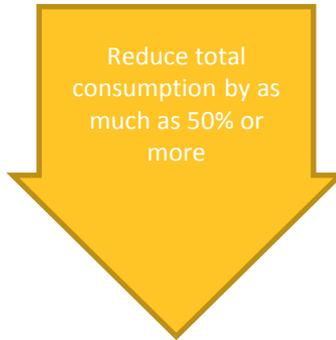


Mitigate rate increases

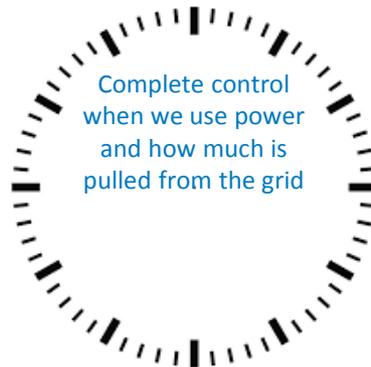
The Source



Increase percentage of Green Power



Reduce total consumption by as much as 50% or more



Complete control when we use power and how much is pulled from the grid



Complete rate certainty & stability



100% Renewable

3 Tactics for Green Power Procurement



SOLAR

On-Site 20 year Solar PPAs

- 4.2 MW installed at existing locations
- Approx 4.5 MW under contract in development



WIND POWER

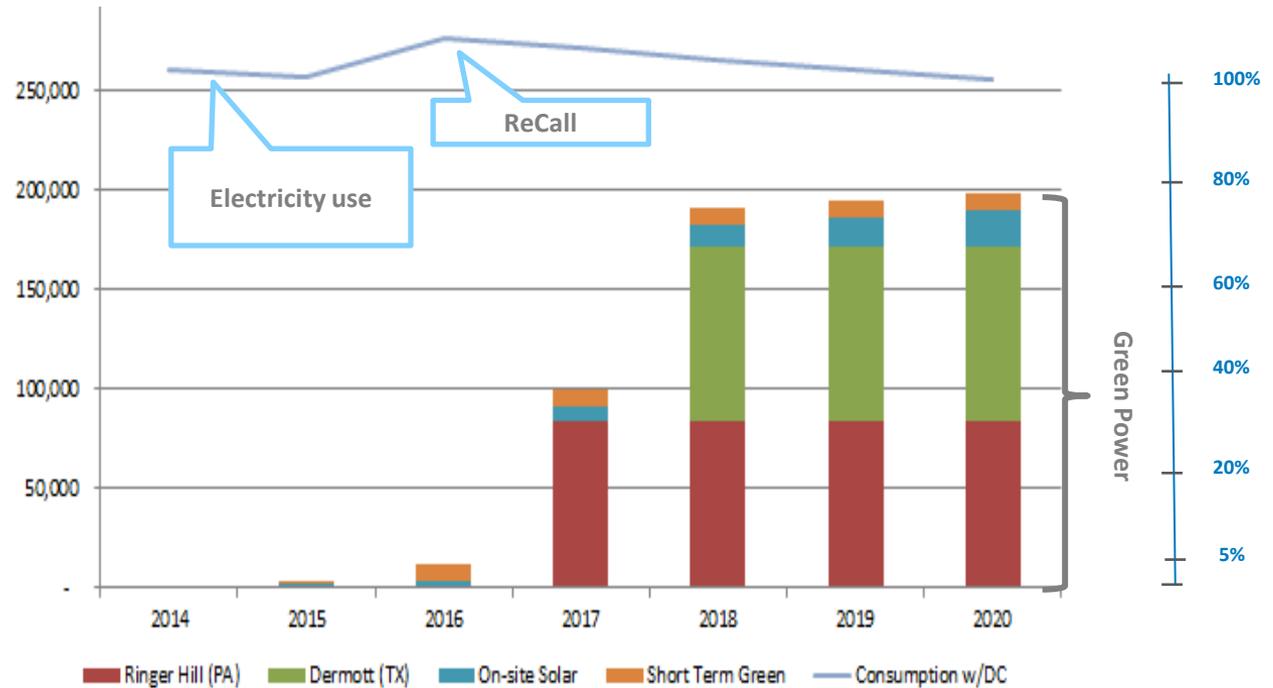
Short Term Direct Power Purchase

- 2016 1 yr/ 8,700 MWhrs Wind via RPD
- 2017 2 yr/ 31,000 MWhrs Wind via RPD

15 year "Virtual" Wind PPAs

- 25 MW with NJR Ringer Hill, PA
- 25 MW with Lincoln Clean Energy, Amazon Wind Farm TX

Forward View of Renewable Electricity in NA



Lessons Learned

- **Sustainable business thinking reveals risks and opportunities we would not have otherwise seen**
 - Organizational Blind Spots
- **Energy was a great prototype of sustainable business change**
 - From blind spot to risk/cost reduction to customer facing opportunity
- **Sustainable Business Skills & Competencies**
 - Metrics matter
 - Drives Innovation – dealing with complexity
 - Internal collaboration
 - And ...

Sustainability is a Team Sport

**CORPORATE RENEWABLE ENERGY
BUYERS' PRINCIPLES: INCREASING
ACCESS TO RENEWABLE ENERGY**



Increasing Market Access with Aggregation



Customer  First
Renewables

Garrett Sprague, Associate on business development team

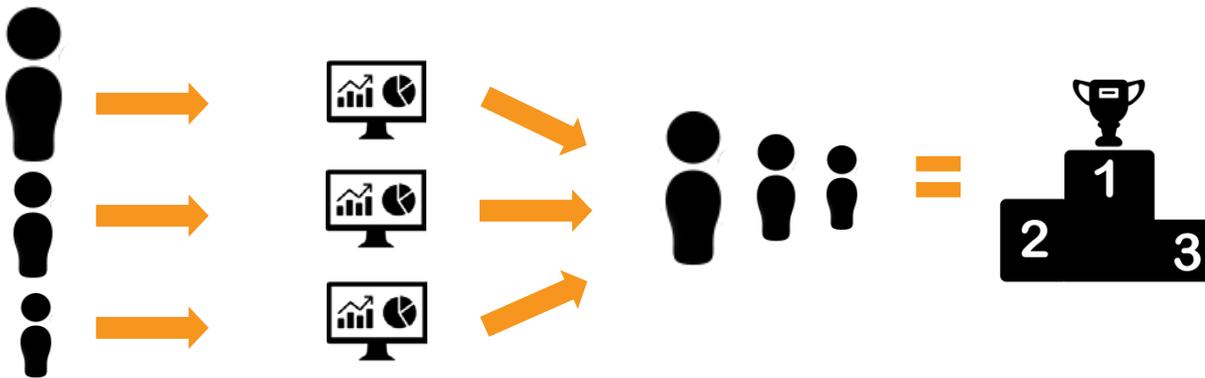
Context Setting: Approaches to Aggregation

Supply-side Products (Disaggregation)



- > Ease of transacting
- > Easy to communicate
- > New renewables?
- > Shorter-term

Demand-side Aggregation



- > Competitive solicitation
- > Flexible
- > Transparent
- > Collaborative

Demand-side Case Study: A Better City Aggregation

Convened by



Percent of Electricity Consumption	40%	100%	100%
Percent of Output	73%	26%	~1%
# of MW	44 MW	15 MW	< 1 MW
# of MWh	~106,500 MWh	~ 38,000 MWh	1,500 MWh

60 MW Summit Farms Solar



255,000 solar panels



650 acres



146,000 MWh



Power for ~9,700 homes

Lessons Learned:

Concept	Detail
Time	> Well-structured buyer aggregations take the same amount of time as individual procurements
Simplification	> Define minimum standards that must be met based on priorities
Flexibility	> Alignment and consensus are key > Each partner signs their own PPA
Collaboration	> Collaboration leads to confidence > Checks and balances between cross-organizational functional stakeholders
Dispersed Load	> Organizations can include load regardless of geographic location > Integrated approach to enhance value at each site
Cost	> Costs are shared on a pro rata (per MWh) basis > Smaller intuitions bare a proportional share of the cost

Keys to Success

An Approach, not a Product

1. **Vision:** Alignment around common goals and objectives
2. **Core team:** One stakeholder from each 'partner'
3. **Strategize:** Build business case;
4. **Convene:** Educate and build consensus
5. **Find advisor:** Issue request for advisory services
6. **Optimized RFP:** Align partner organizations; Issue tailored RFP
7. **Buying Power:** Leverage your buying power with others

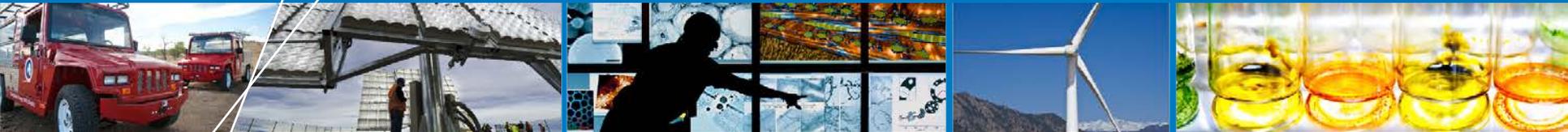


Garrett Sprague
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Accelerate your organization's switch
to renewable energy with a trusted
advisor and tailored solution

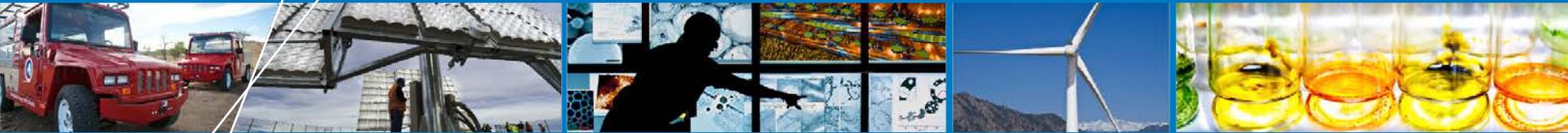
Customer  First
Renewables

Serving the Corporate Market



**Stan Blackwell, Director
Customer Service and
Strategic Partnerships at
Dominion Energy**

Corporate Procurement of Renewable Energy In Washington State



**Jennifer Snyder, Regulatory
Analyst**



Voluntary residential renewable energy programs

- **Legislative Direction:** In 2001, Washington state legislature passed a law requiring all electric utilities to offer voluntary alternative energy resources ([RCW 19.29A.090](#)).
- **Puget Sound Energy:** [Green Power](#) and [Solar Choice](#) Programs
 - Over 40,000 residential customers
 - Green Power is \$10/month, Solar Choice is \$20/month
- **Avista:** [Buck-A-Block Program](#)
- **Pacific Power:** [Renewable Energy Program](#)



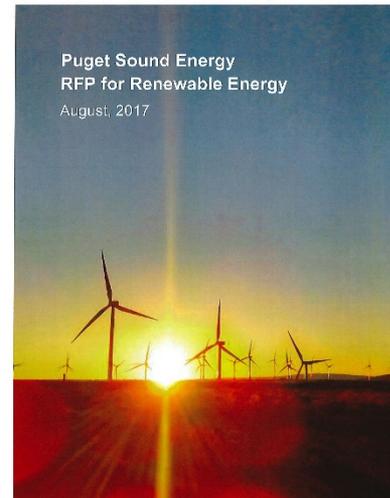
PSE Green Direct Program

- Puget Sound Energy Electric Tariff [Schedule No. 139](#)
- First-in-the-nation, subscriber-based, voluntary, long-term program for the output of a specific, new renewable energy resource.
- Designed for large corporate customers, government institutions, and municipalities.
 - Customers must have an aggregate annual load of 10,000 MWh, or be a government institution.
- UTC approved on September 28, 2016, in [Docket UE-160977](#).



PSE Green Direct Program

- Phase I was capped at 75 aMW and was fully-subscribed in June 2017.
 - Project is the RES Americas Skookumchuck Wind Energy Project located south of Olympia, WA.
 - Customers included King County, Western Washington University, Target, Starbucks, REI, Sound Transit and the cities of Mercer Island, Anacortes, Bellevue, and Snoqualmie.
- PSE issued a second RFP in August 2017 and hopes to enroll customers in Phase II in the middle of 2018



PSE - Microsoft Special Contract

- PSE's existing direct access tariffs, Schedule 448 (Power Supplier Choice) and Schedule 449 (Retail Wheeling Service), are closed to new customers.
- Based on sustained interest by Microsoft, PSE originally filed a new direct access tariff – Schedule 451 for Schedule 40 customers with a minimum average of 10 aMW at one or more sites in a year.
 - Only Microsoft met those requirements.
- PSE's filing was resolved through an all-party Settlement, and approved as a Special Contract (July 2017).
- Testimony, documents, and orders can be found in [Docket UE-161123](#)



Regulation in the Public Interest

- The Commission approved the Special Contract in [Order 06, UE-161123](#)
 - The Commission regulates in the public interest, ensuring that rates are fair, just, and reasonable.
 - The Commission must balance the pursuit of individual and state energy policy goals, such as increasing renewable energy, with the needs of all utility customers.
 - Large business access to wholesale markets, regardless of the rationale, should not result in unreasonable and unaffordable rates for remaining customers.
 - “Microsoft’s suite of commitments in the Settlement addresses these concerns to a significant degree.” (para. 92)
 - Microsoft will remain a transmission and distribution customer.
 - Special Contract automatically renews in five-year increments until Microsoft has the ability to meet its needs with self-generation.

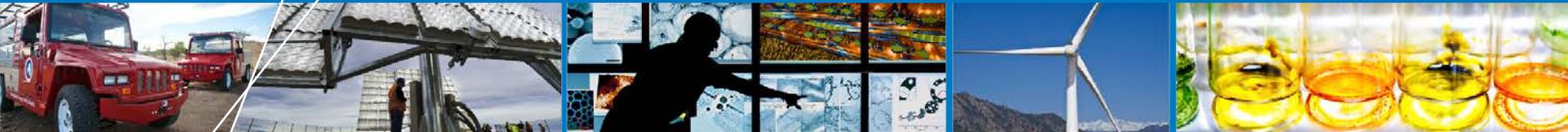
- Important considerations included the nature of the customer, its unique characteristics, and that the terms were submitted as a special contract.
 - Special contracts are not precedential.
 - Microsoft has the capability and size to assume the risks and benefits of direct access.
 - The contract limits direct access to Microsoft's two core areas of operations (campuses) comprising 80% of its load. The remaining 20% will continue to take service as a bundled customer.
 - "Single point locations with large demands, such as those identified by Microsoft, are best suited for direct wholesale market access because they minimize the amount of affected transmission, distribution, and metering facilities, thereby reducing the network impacts and greatly facilitating the energy scheduling and financial settlement processes." (para. 93)

- **\$23.6 million transition fee**
 - Puget Sound Energy proposed using the Revenue Lost methodology.
 - ✓ The net present value of the revenue and cost differences with and without Microsoft over a 20-year period.
 - ✓ PSE estimated that it would be revenue short \$23.6 million over the first five years.
 - Some parties, including Microsoft, disputed PSE's proposed methodology and five-year time frame.
 - In Settlement, Microsoft chose to pay the proposed exit fee.
 - The Commission did not endorse a particular transition fee methodology, finding that the evidence in the record amply supported the fee as reasonable.
- The Commission's Order is explicit that the exit fee does not include Colstrip Generating Facility closure costs.

Suite of Commitments

- Microsoft committed to purchase renewables above-and beyond state Renewable Portfolio Standard requirements.
 - 25% through 2020
 - 40% beyond 2020
 - Commission Staff enforces compliance with agreed-to RPS standards
- 100% Carbon-free Power
 - Existing hydro does not count for RPS compliance, but is carbon free.
 - Fossil-fuel power to provide ancillary services must be offset by renewable energy credits.
- Microsoft committed to continue to pay into conservation programs, as if it remained a Schedule 40 customer.
- Similarly, Microsoft committed to funding low-income assistance fixed at current rates,
 - Plus, additional funding (half current low-income assistance rates) for low-income weatherization and renewable energy.

Question and Answer Session



For further information related to the content of this presentation contact:

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