State of the Voluntary Green Power Market

March 13, 2019

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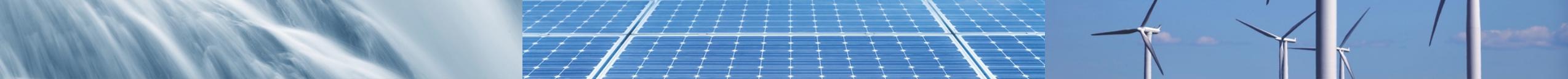- Mic & Speakers

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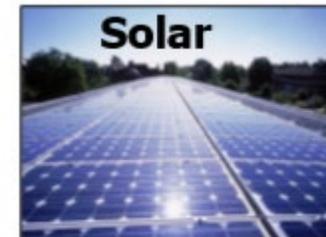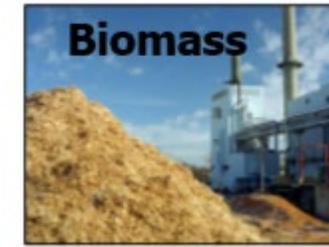
Speakers and Agenda

- Speakers:
  - Christopher Kent, Program Manager, U.S. EPA's Green Power Partnership
  - Eric O'Shaughnessy, Renewable Energy Analyst, National Renewable Energy Laboratory

- Agenda:
  - Basics of Green Power
  - Green Power Partnership Overview
  - GPP Program Data Summary
  - Status and Trends in U.S. Voluntary Green Power Market
  - Question and Answer session
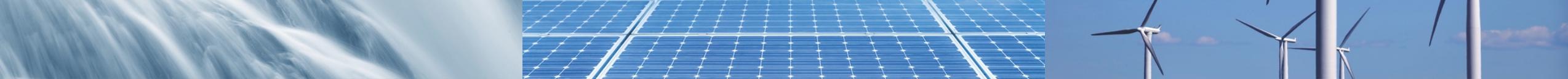
What is Green Power?

- Subset of renewable energy – representative of resources and technologies that offer the highest environmental benefit.
- Electricity generated from natural resources that replenish themselves over short periods of time, including the sun, wind, moving water, organic plant and waste material (biomass), and the Earth's heat (geothermal).
- Must be from "new" facilities placed into service within last 15 years.
- Must be from the "voluntary" market.

Categories of Green Power Supply

Category	Green Power Supply Option
Retail Supply Options: • Standardized products (e.g. resource mix, price, 3rd-party certification status) for sale to consumers from retail suppliers, such as utilities, competitive electricity suppliers, and REC marketers. • Generally involve short-term commitments by the consumer to purchase a pre-determined volume or a volume tied to their electricity consumption. • The renewable energy project(s) used to supply the product may be periodically changed by the supplier during the duration of the contract.	**Unbundled Renewable Energy Certificates (RECs)**
	Competitive Green Power Product
	Utility Green Power Product
	Community Choice Aggregation
Project-Specific Supply Options: • Generally customized products negotiated between the consumer and supplier. • Involve long-term commitments by consumers to purchase a volume tied to the output of a pre-determined generation capacity. • The renewable energy project used to supply the product is constant throughout the term of the contract or commitment.	**Self Supply**
	Utility Green Tariff
	Shared Renewables
	Physical Power Purchase Agreement
	Financial Power Purchase Agreement

For more information visit: https://www.epa.gov/greenpower/green-power-supply-options

Green Power Partnership Overview

- Summary
  - The U.S. EPA's Green Power Partnership is a voluntary program that encourages organizations to use green power.
- Objectives
  - Reduce U.S. greenhouse gas emissions
  - Expand the voluntary green power market
  - Standardize green power procurement as part of best practice environmental management
- Program Activities
  - Provide technical assistance and tools on procuring green power
  - Provide recognition platform for organizations using green power in the hope that others follow their lead
- ~1,500 Partners are purchasing >55 billion kWh annually
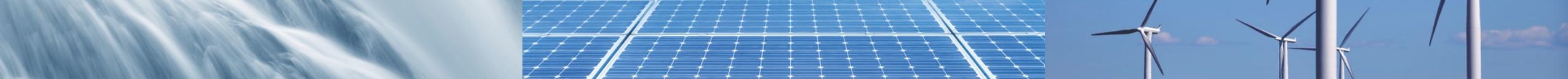
Partnership Requirements

- EPA supports Partners' procurement of green power by offering advice, technical support, tools and resources, and recognition.
- Partners agree to procure green power and provide an annual update.
- In return, EPA commits to:
  - Provide public recognition
  - Provide procurement and communications assistance, as requested
  - Provide a brief description of the Partner's green power use on EPA's website

	Partnership Benchmark
If your annual electricity use is:	You must, at minimum, use this much green power:
Over 100,000,000 kWh	3% of your use
10,000,001-100,000,000 kWh	5% of your use
1,000,001-10,000,000 kWh	10% of your use
Under 1,000,000 kWh	20% of your use

EPA's 1,500 Green Power Partners

U.S. EPA's Green Power Partnership

- **Credible Benchmarks & GHG Quantification**
  - Metrics for "How much green power is enough?"
  - Definition of eligible renewables & products
  - Greenhouse gas accounting and calculations

- **Planning & Implementation Resources**
  - Purchasing strategy guidance
  - Marketing and communications support
  - Toolbox for Renewable Energy Project Development

- **Recognition**
  - Top Partner Lists
  - Use of the Partner mark
  - Green Power Leadership Awards
  - Promotional opportunities

- **Best Practices & Innovation**
  - New contract mechanisms

EPA's Top Partner Lists

Green Power Partnership National Top 100

Released on February 5, 2019

NATIONAL TOP 100

The National Top 100 list represents the largest green power users within the Green Power Partnership. The combined green power usage of these Top 100 Partners amount to more than 47 billion kilowatt-hours annually, which represents approximately 86 percent of the green power commitments made by all EPA Green Power Partners.

- [National Top 100]
- Top 30 College & University
- Top 30 K-12 Schools
- Top 30 Local Government
- Top 30 On-site Generation
- Top 30 Retail
- Top 30 Tech & Telecom
- 100% Green Power Users
- Fortune 500® Partners List
- Long-term Contracts

Partner Name	Annual Green Power Usage (kWh)	GP % of Total Electricity Use*	Industry	Providers (listed in descending order by kWh supplied to Partner)	Green Power Resources
1. Microsoft Corporation	4,557,278,000	100%	Technology & Telecom	Sterling Planet°, Enbridge LLC, EDF Renewable Energy, Black Hills Corp., Renewable Choice Energy°, Self-supply	Solar, Wind
2. Intel Corporation	4,152,034,623	100%	Technology & Telecom	Renewable Choice Energy°, 3Degrees°, Unknown, PNM, Self-supply	Various
3. Google Inc.	2,409,051,735	53%	Technology & Telecom	MidAmerican Energy°, NextEra Energy Resources°, Grand River Dam Authority°, Northern Wasco County PUD, Enel Green Power North America, Exelon Generation, EDF Renewable Energy, Self-supply, Duke Energy, Unknown	Biogas, Small-hydro, Solar, Wind
4. Wells Fargo	1,983,773,126	106%	Banking & Fin. Srvcs.	Renewable Choice Energy°, Self-supply	Solar, Wind
5. Apple Inc.	1,650,398,166	107%	Technology & Telecom	Self-supply, 3 Phases Renewables°, Avangrid Renewables°, 3Degrees°, Cypress Creek Renewables, SunPower, Silicon Valley Power°, NC GreenPower°, Austin Energy°, Duke Energy, Sacramento	Various

EPA GREEN POWER PARTNERSHIP

New Resource – Supply Options Screening Tool

- Easy-to-use spreadsheet tool
- Available at: www.epa.gov/greenpower/procurement-tools-resources

New Resource - Equivalency Calculator

- Resource to help you to better communicate your green power use to stakeholders by translating it from kilowatt-hours (kWh) into more understandable terms and concrete examples.
- Available at: www.epa.gov/greenpower/procurement-tools-resources

Enter Your Green Power Use
Note, 1 MWh is equal to 1,000 kWh.

10,000,000   kWh/year

CALCULATE

Equivalency Results *How are they calculated?*

This amount of green power is enough to power:

929	29,411,765
Homes' electricity use for one year	Miles driven by electric car

To produce an equivalent amount of power would require:

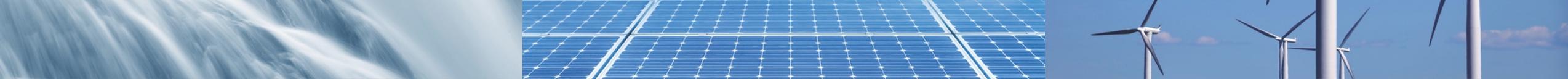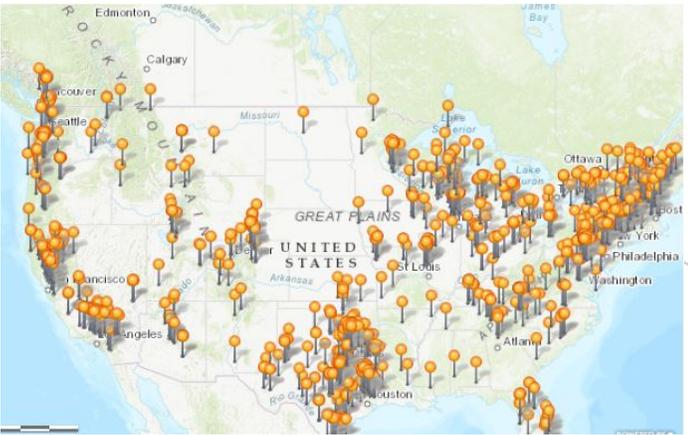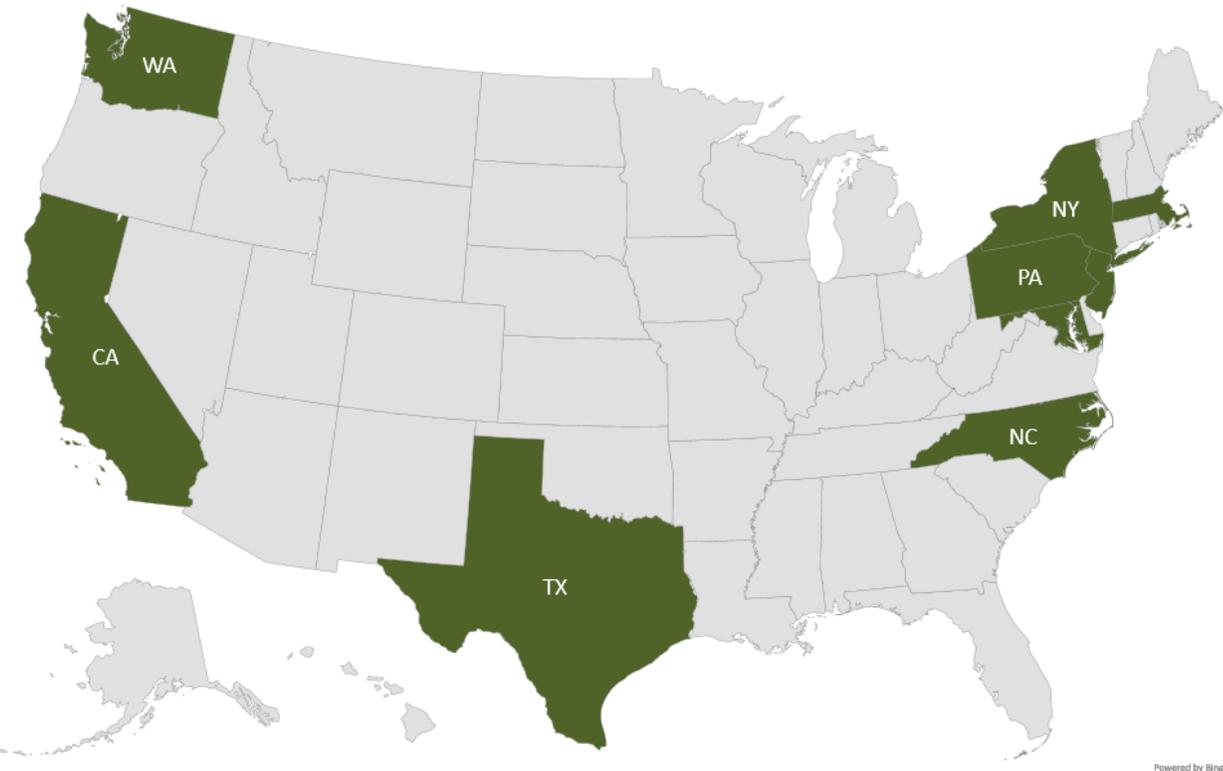| 1	9
Wind turbines running for one year	Football fields of solar panels for one year

Top Green Power Usage by State

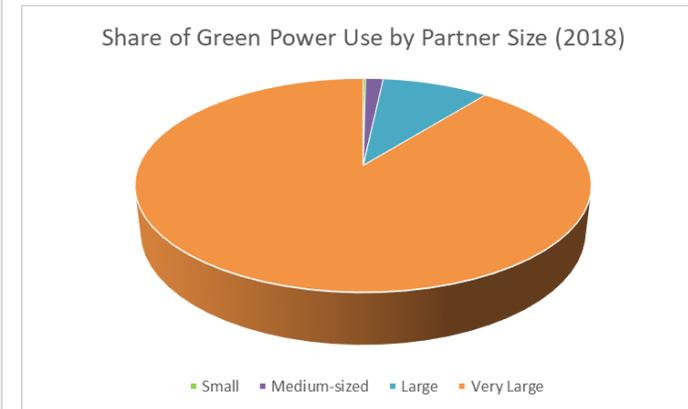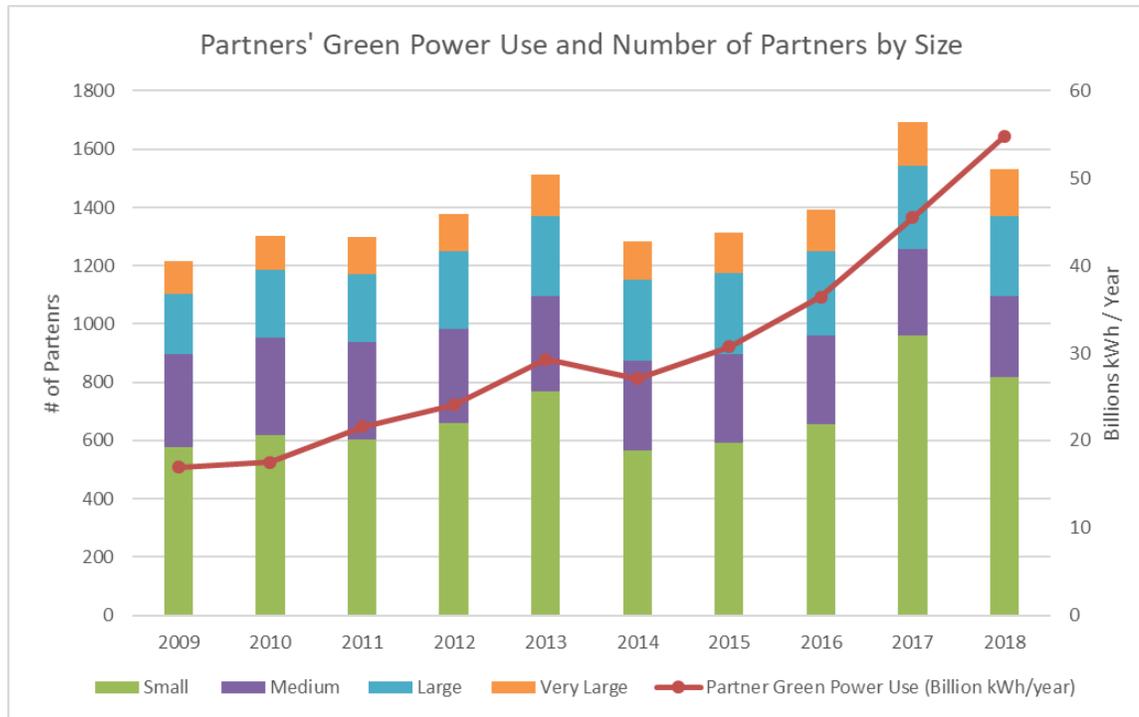| State	Green Power
CA	16,155,518,629
WA	6,442,626,612
TX	4,609,051,501
NY	3,462,325,977
NJ	3,228,706,906
DC	2,491,122,498
PA	2,339,978,789
NC	1,656,483,180
MA	1,583,836,877
MD	1,309,635,331

Green Power Usage by Industry

Green Power Usage by Industry

- Technology & Telecom — 20,653,922,512
- Banking & Fin. Srvcs. — 6,125,812,298
- Govt. (Local, Municipal) — 4,545,673,153
- Education (Higher) — 4,213,576,573
- Consumer Products — 3,253,194,896
- Retail — 2,959,944,509
- Health Care — 2,002,532,851
- Food & Beverage — 1,683,502,966
- Govt. (Federal) — 1,505,540,996
- Industrial Goods & Srvcs. — 1,364,846,571
- Other Industries — 7,142,584,208

GPP Green Power Use and Number of Partners

Partners' Green Power Use and Number of Partners by Size

Share of Green Power Use by Partner Size (2018)

Annual Green Power Use by Supply Option

Green Power (kWh) by Year and Product Type
All Partners

Product Type
- Project: Financial PPA
- Project: Physical PPA
- Project: Self-supply
- Project: Shared
- Project: Tariff
- Retail: CCA
- Retail: Competitive
- Retail: REC
- Retail: Utility

Annual Green Power Use by Supply Option

Green Power (kWh) by Year and Product Type
Small Partners

Green Power (kWh) by Year and Product Type
Very Large Partners
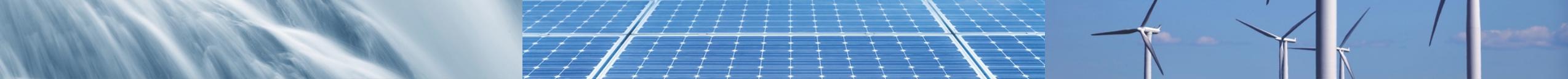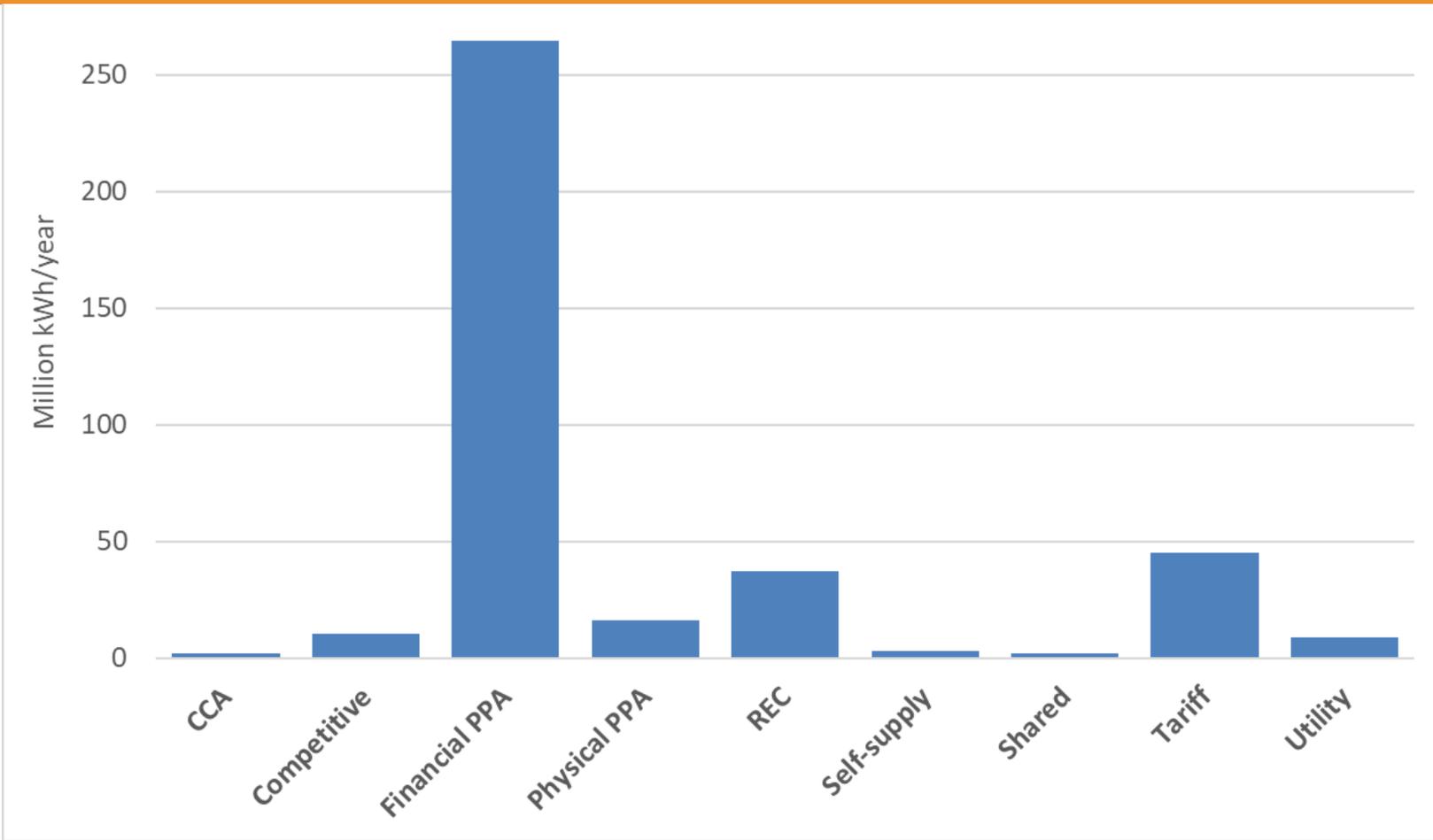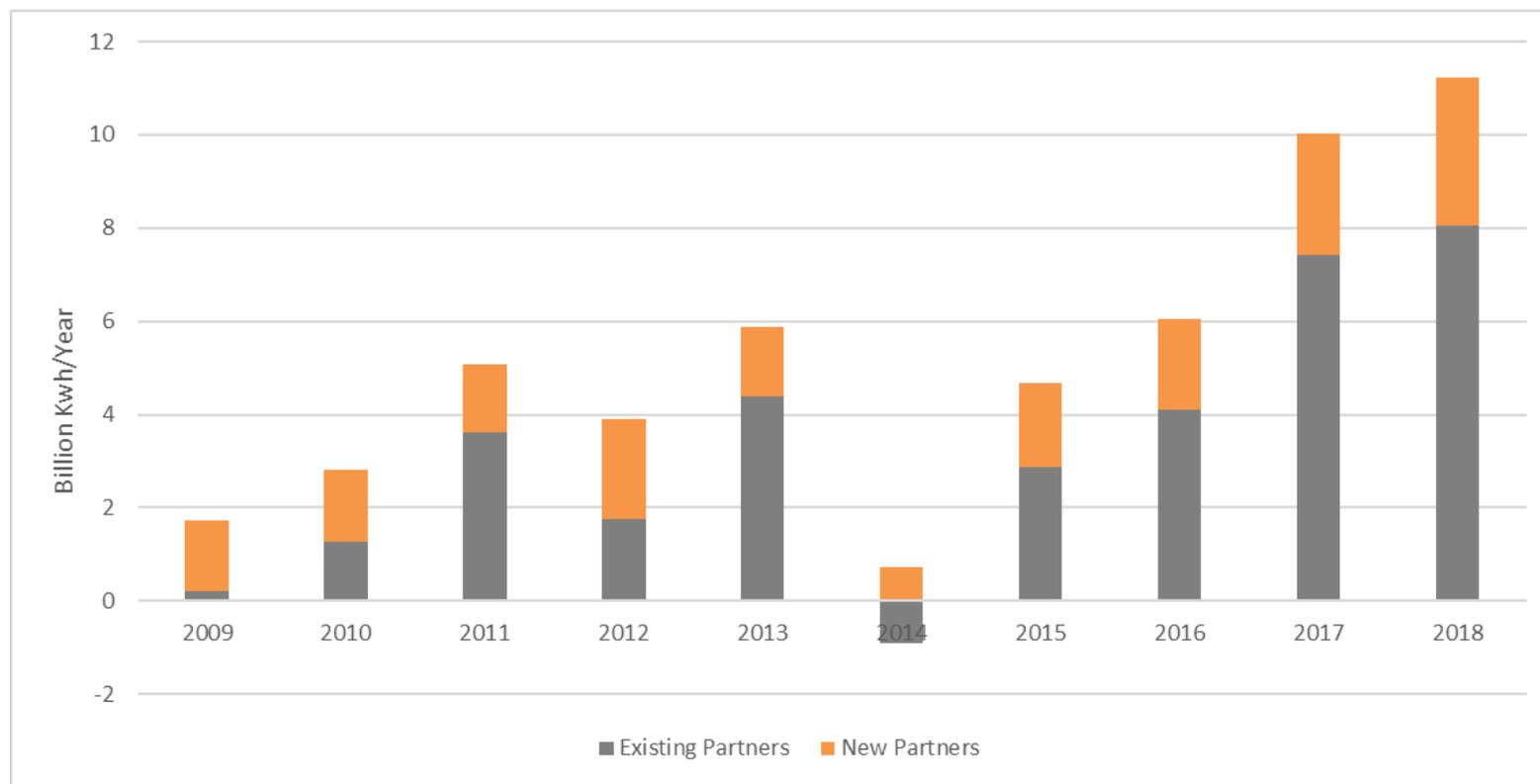
Green Power Supply Options by Benchmarks
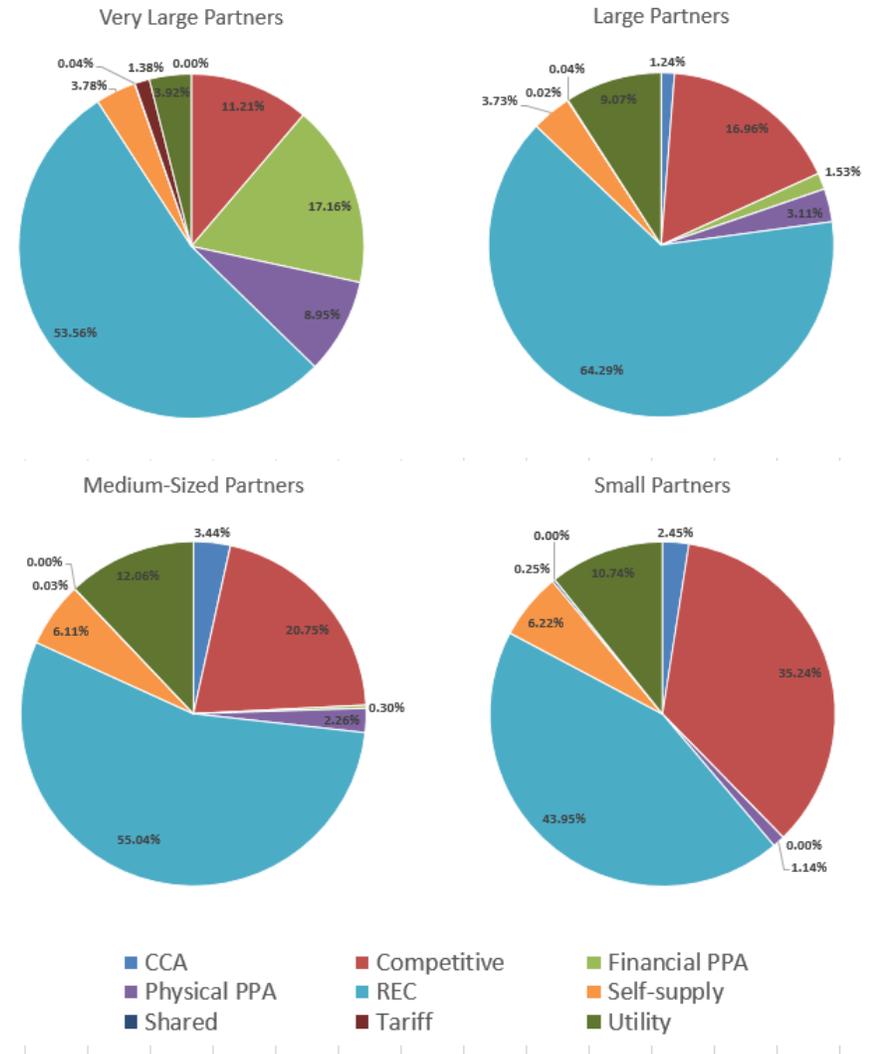
Average Green Power Contract Size in kWh by Supply Option

Program Growth

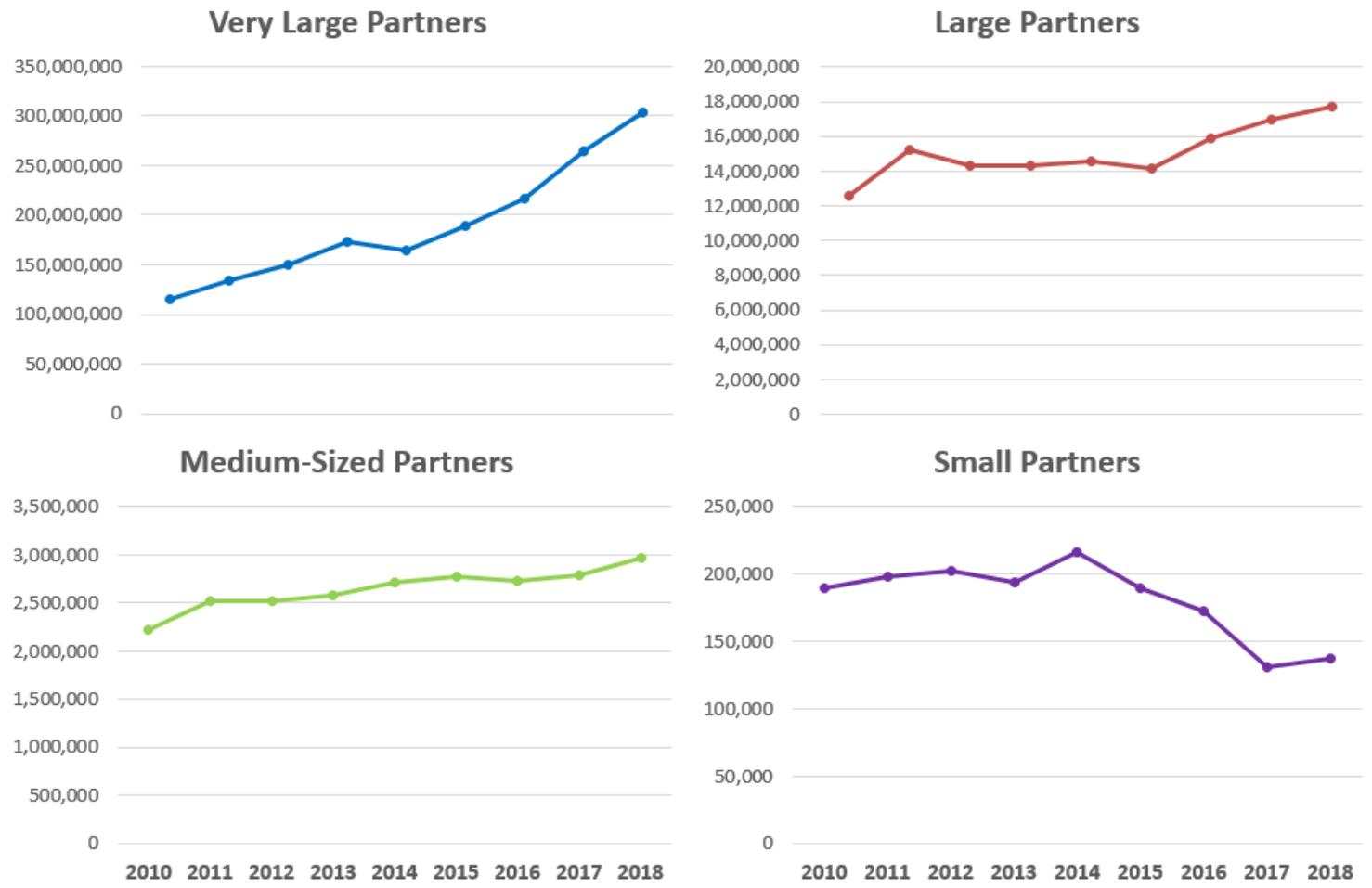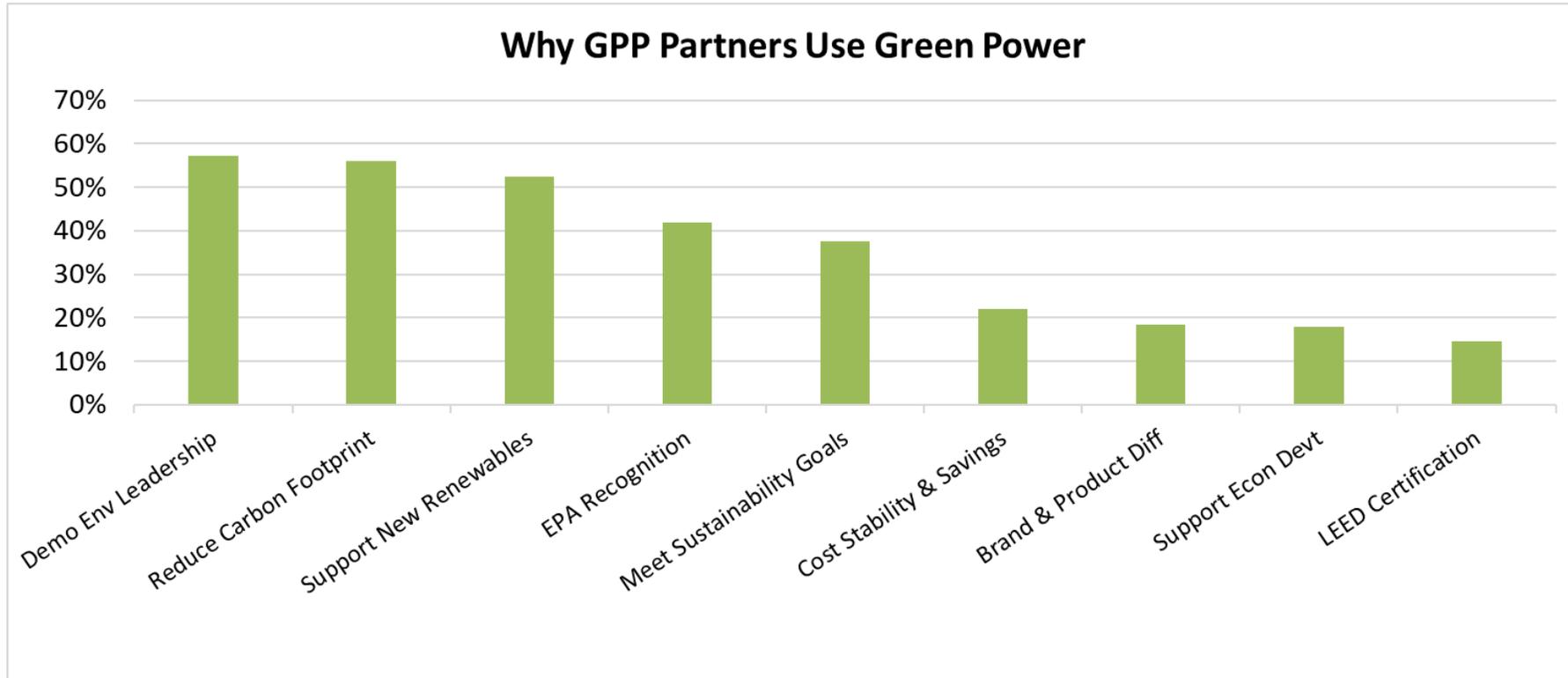# Average Green Power Use by Partners
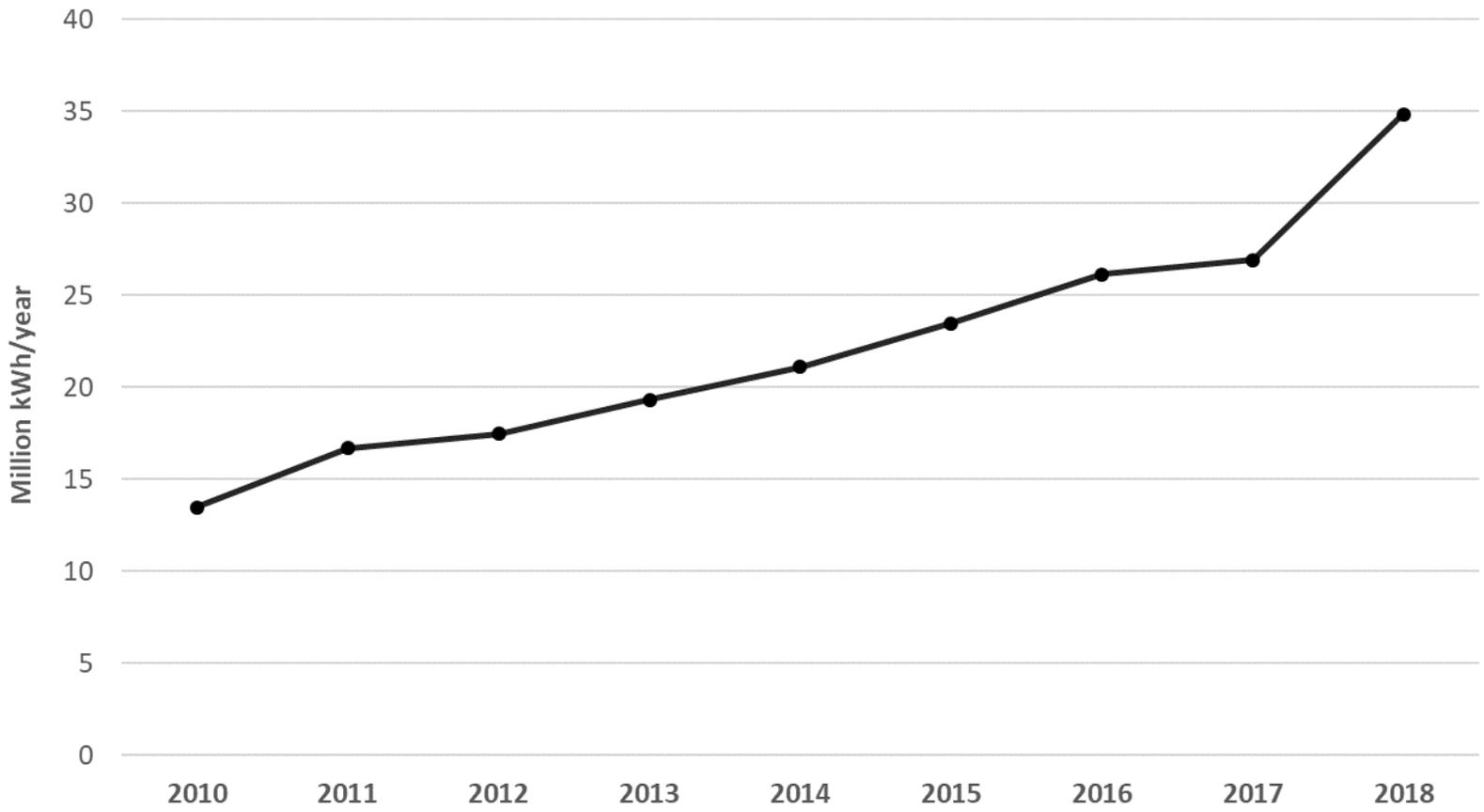
Average Green Power Use by Partners

Motivation

Why GPP Partners Use Green Power

Category	Approx. %
Demo Env Leadership	57%
Reduce Carbon Footprint	56%
Support New Renewables	52%
EPA Recognition	42%
Meet Sustainability Goals	38%
Cost Stability & Savings	22%
Brand & Product Diff	19%
Support Econ Devt	18%
LEED Certification	14%

Questions?

- Christopher Kent, EPA, kent.christopher@epa.gov
- Eric O'Shaughnessy, NREL, eric.oshaughnessy@nrel.gov
  - Jenny Heeter, NREL, jenny.heeter@nrel.gov

Resources:

GPP Program Success Metrics

- https://www.epa.gov/greenpower/green-power-partnership-program-success-metrics

Status and Trends in the U.S. Voluntary Green Power Market (2017 Data)

- https://www.nrel.gov/docs/fy19osti/72204.pdf