



Green Power: Data Center Supplier and Customer Opportunities

November 12, 2020



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State of the Voluntary Green Power Market
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Speakers and Agenda

- Speakers:
 - James Critchfield, Director - U.S. EPA, Green Power Partnership
 - Travis Wright, VP of Energy and Sustainability - QTS
 - Andres Rodriguez, Program Manager, Energy and Climate - IBM

- Agenda:
 - Basics of Green Power
 - Green Power Partnership Overview
 - Data Center Types and Principles
 - Data Center-Client Collaborative Relationship
 - 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
<p>Retail Supply Options:</p> <ul style="list-style-type: none"> 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
<p>Project-Specific Supply Options:</p> <ul style="list-style-type: none"> 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



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 in kilowatt-hours is:	You must, at minimum, use this much green power:
Over 100,000,000 kWh	7% of your use
10,000,001-100,000,000 kWh	10% of your use
1,000,001-10,000,000 kWh	25% of your use
100,000-1,000,000 kWh	50% of your use

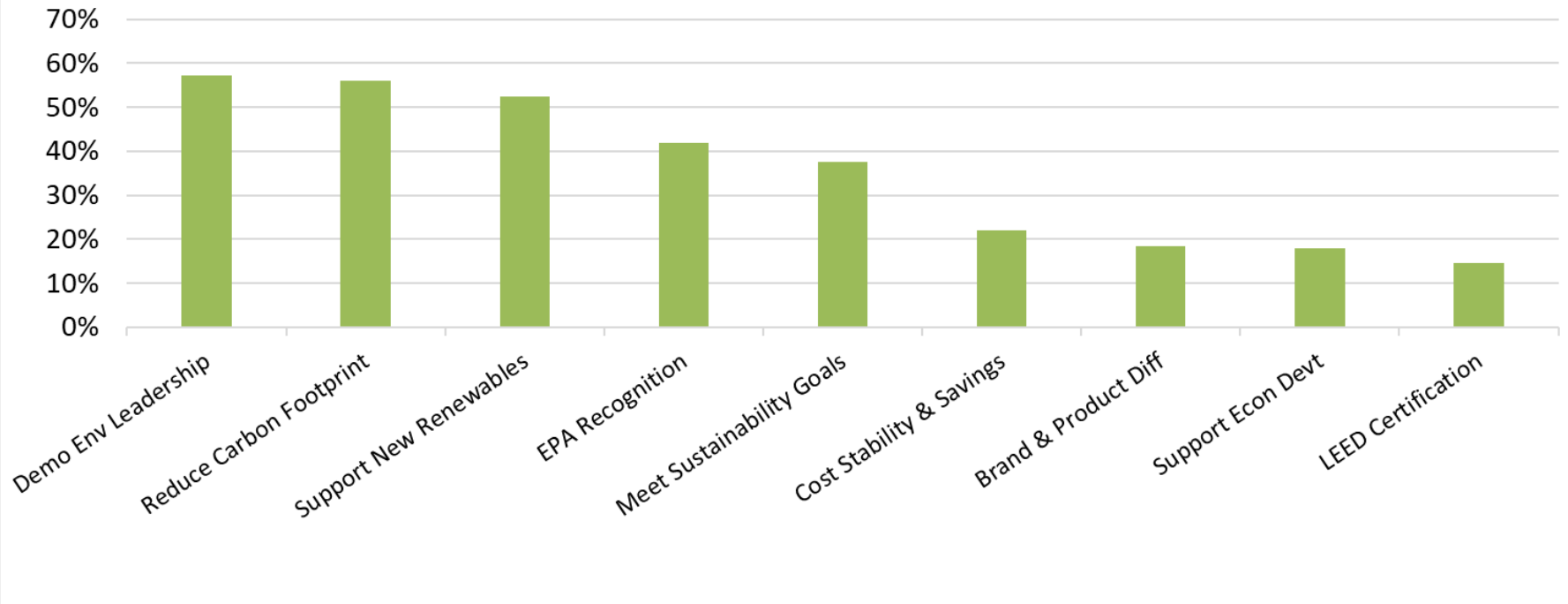


EPA's Green Power Partners



Motivation

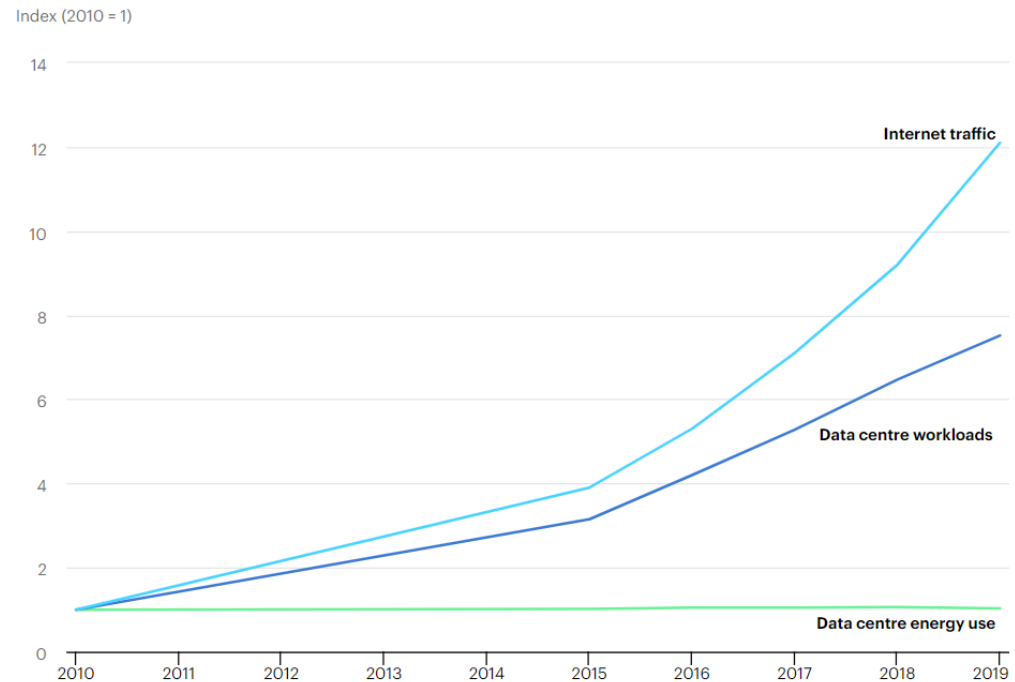
Why GPP Partners Use Green Power



Data Centers

- Information backbone in an increasingly digitized world
- Data centers = ~1% of 2019 global final electricity demand
- Over last decade, data center energy use has remained flat due to energy efficiency gains
- U.S. data center market expected revenue by 2024: \$69 billion

Global trends in internet traffic, data centre workloads and data centre energy use, 2010-2019



Source: IEA



Data Center Examples

- **Enterprise**
 - Data center owned and operated by the company it supports, often onsite
- **Colocation**
 - One data center owner rents space, power and cooling to larger customers
 - Can be retail or wholesale based on customer size and space requirements
- **Cloud**
 - An off-site data center where data and applications are hosted by a private or public cloud services provider
 - The end user is unaware of where data is hosted
- **Modular**
 - Small, deployable data center units that provide flexibility

Corporate Colocation and Cloud Buyer's Principles



1. Options

Provide options for cost-competitive services powered by renewable resources that reduce emissions beyond business as usual.



2. Data

Deliver monthly data on the colo customer's direct and indirect energy consumption, water consumption, greenhouse gas emissions, and other environmental data.



3. Incentives

Align the partnership between customer and service provider so both parties have an incentive to reduce energy consumption.



4. Collaboration

Provide options for colo customer collaboration on efficiency and renewable energy enhancements.



5. Disclosure

Disclose individual sites and total global corporate footprint, as well as site-specific energy sources.



6. Advocacy

Engage in policy advocacy efforts that support the use of renewable energy.



Data Center-Client Collaborative Relationship

- Location
- Data
- Reliability
- Security
- Connectivity
- Scalability
- Economics
- Sustainability
 - GHG accounting
 - Renewable electricity use
- Leasing terms
- Other interests...

Guest Speaker – Travis Wright, QTS



QTS

- Partner since Oct. 2018
- #12 on EPA's Top 30 Tech & Telecom List
- 2020 Green Power Leadership Award Winner

- **QTS Realty Trust, Inc.** is a leading provider of data center solutions across a diverse footprint spanning more than 6 million square feet of owned mega scale data center space in North America.
- **Travis Wright** - Vice President of Energy and Sustainability
 - Manages utility procurement and energy efficiency programs.
 - Sits on the QTS site selection team where he negotiates new-site infrastructure agreements and tax incentives and fosters government relations.
 - Previously he also served as the Site Director leading operations at the QTS Mega facility in Irving, TX.
 - Prior to joining QTS, Travis managed huge facilities in the semiconductor industry with Western Digital and STMicroelectronics.
 - Travis holds a B.S. in Mechanical Engineering from Marquette University and he is a Six Sigma green belt as well as a Certified Energy Manager.
 - D CEO Magazine named him as one of the most influential business leaders in North Texas four times in a row, and in 2019 Data Economy named Travis to the Climate 50 – The World's Topmost Influential Climate Leaders In Data Centers And Cloud.

Guest Speaker – Andres Rodriguez, IBM



IBM

- Partner since Sept. 2011
- #23 on EPA's Top 30 Tech & Telecom List

- **IBM** is a global leader in technology manufacturing, integrated computer systems, software and IT business services and solutions. IBM Cloud provides global, on-demand data center and hosting services from data centers in Dallas, Houston, San Jose, Seattle, and Washington D.C., and locations around the globe.
- **Andres Rodriguez** - Program Manager in IBM's Corporate Environmental Affairs team
 - Andres' area of focus has been the management and advancement of IBM's energy conservation, renewable energy and climate protection programs
 - He has been intimately involved in IBM's corporate goal and strategy setting, performance analysis, and reporting.
 - His responsibility extends internationally with a regional focus on Latin America, providing ongoing advice and counsel to IBM business units on environmental matters.
 - He holds a B.Eng. in Chemical Engineering from the Munich University of Applied Sciences and a M.S. in Sustainable Resource Management from the Technical University of Munich.



Questions?

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- Travis Wright, QTS, travis.wright@qtsdatacenters.com
- Andres Rodriguez, IBM, arodrig@us.ibm.com