



# Introduction to Green Power Supply Options



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Talking: Christopher Kent

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# Speakers and Agenda

- Speakers:
  - Christopher Kent, Program Manager, U.S. EPA's Green Power Partnership
- Agenda:
  - Green Power Partnership Overview
  - Green Power Market Summary
  - Summary of Supply Options
  - Review of Green Power Supply Options Screening Tool
  - Question and Answer session



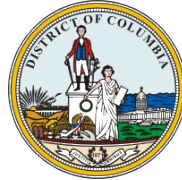


# Green Power Partnership Overview

- Summary
  - The U.S. EPA's Green Power Partnership is a voluntary program that encourages organizations to use green power
- Objectives
  - Educate stakeholders on voluntary procurement options within the U.S. renewable energy market
  - Motivate stakeholders to use renewable electricity and expand the voluntary green power market
  - Standardize green power procurement as part of best practice environmental management
  - Recognize leadership in green power procurement
- 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
- 1,600+ Partners procure more than 50 billion kWh annually, equivalent to the annual electric use of more than 4.6 million American homes.



# EPA's 1,600 Green Power Partners



# New Partnership Resources!

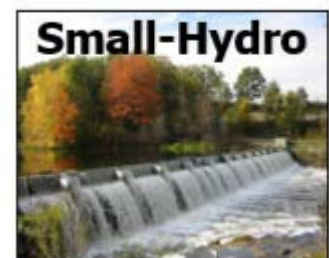
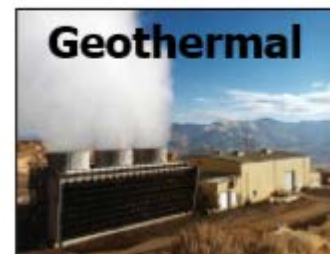
- **NEW Green Power Supply Options webpages** providing concise definitions of the various options in the renewable energy marketplace, including financial PPAs and utility green tariffs.
- **NEW Green Power Equivalency Calculator** helps you to better communicate your green power use to stakeholders by translating it from kilowatt-hours (kWh) into more understandable terms and concrete examples.
- **NEW Guide to Making Claims About Your Solar Power Use** describes best practices for appropriately explaining and characterizing solar power activities and the fundamental importance of renewable energy certificates (RECs) for solar power use claims.
- **NEW Renewable Energy Certificate (REC) Arbitrage** guidance document describes procurement strategy used by consumers installing self-financed renewable electricity projects or consumers who purchase renewables electricity directly from a project, such as through a power purchase agreement (PPA).
- **NEW: Renewable Energy Certificate (REC) vs Offsets** guidance document that describes the difference with these two instruments, why organizations might use one or both and common misconceptions about them.





# 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.



# Renewable Energy Certificates

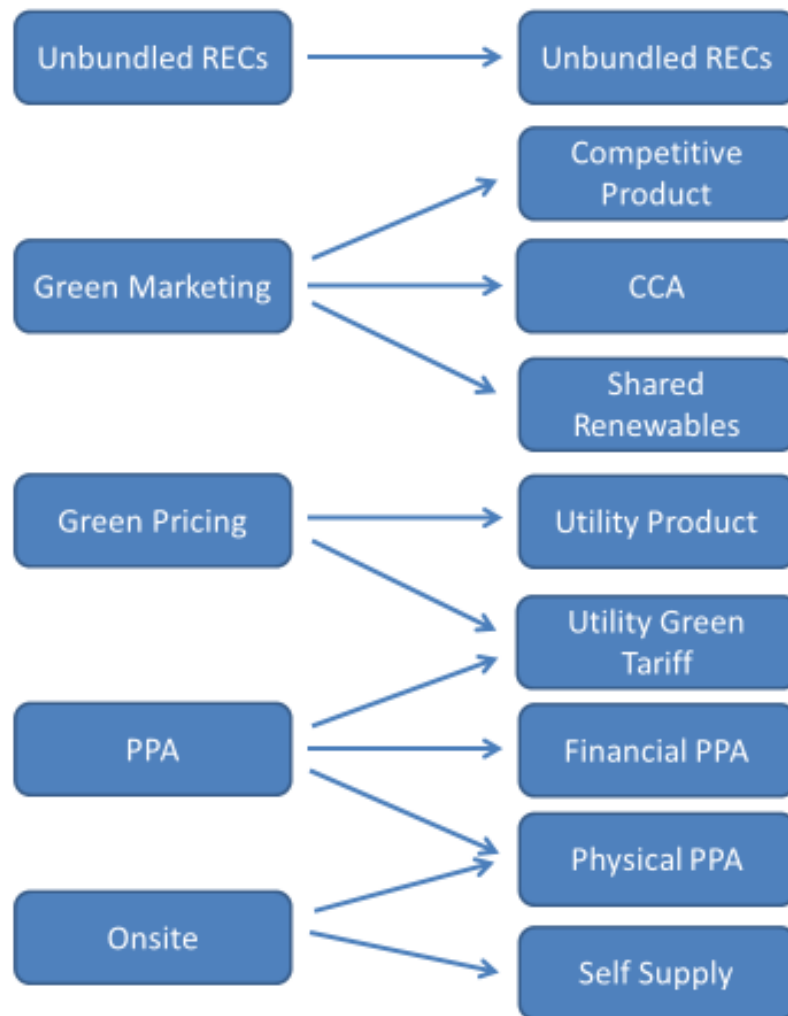
- What is a REC?
  - Tradeable, market-based instrument that represents the legal property rights to the “renewable-ness”—or non-power (i.e., environmental) attributes—of renewable electricity generation.
  - 1 REC is created for every MWh of electricity generated and delivered to the grid from a renewable energy resource.
  - Electricity cannot be considered renewable without a REC to substantiate its renewable-ness.
  - All Green Power Supply Categories include RECs
- RECs: Making Green Power Possible Video
  - <https://www.youtube.com/watch?v=12VYXms6-c>







# Evolving Supply Categories



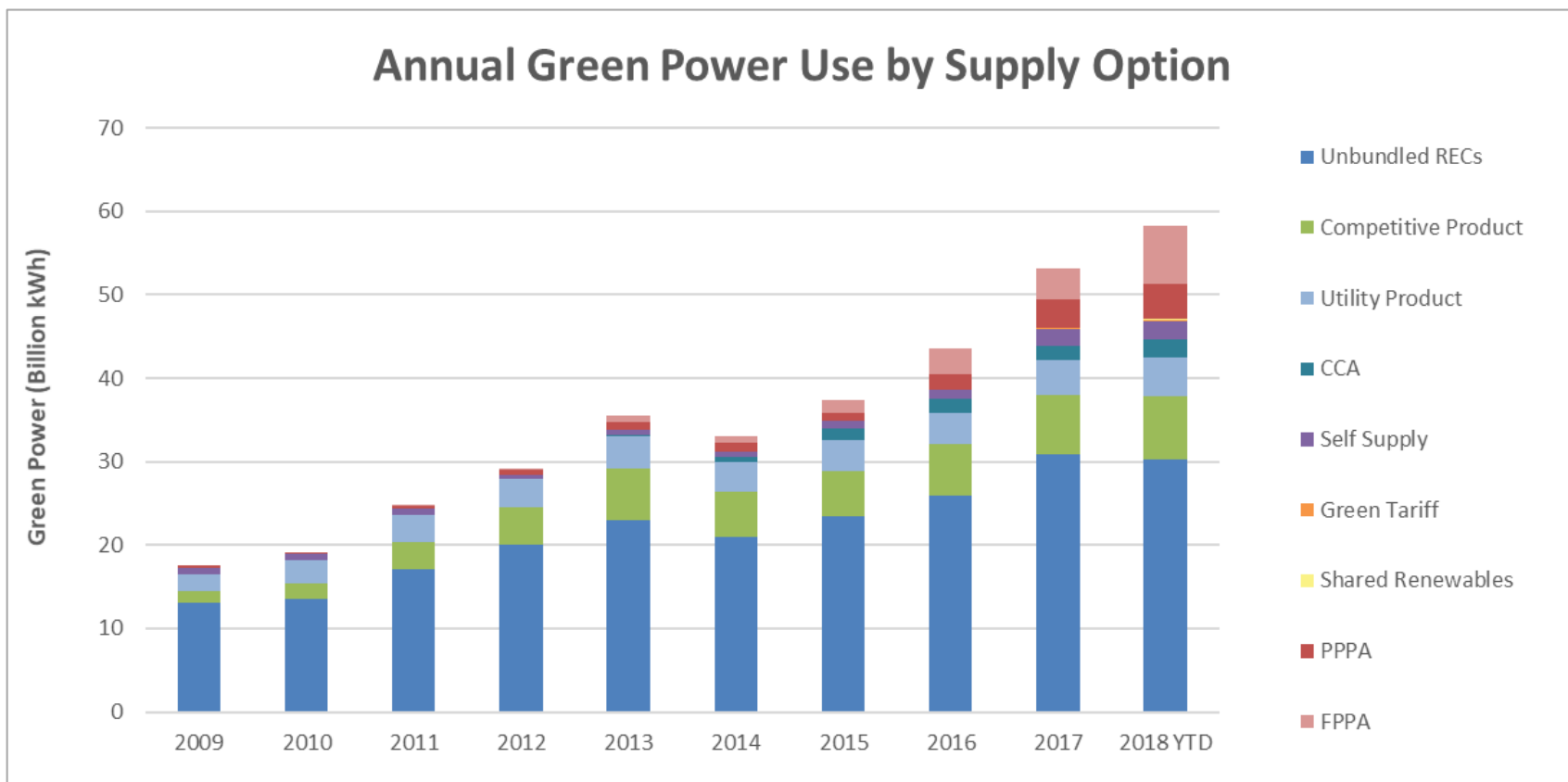


# Categories of Green Power Supply

Category	Green Power Supply Option
<p><b>Retail Supply Options:</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>Generally involve short-term commitments by the consumer to purchase a pre-determined volume or a volume tied to their electricity consumption.</li> <li>The renewable energy project(s) used to supply the product may be periodically changed by the supplier during the duration of the contract.</li> </ul>	<b>Unbundled Renewable Energy Certificates (RECs)</b>
	<b>Competitive Green Power Product</b>
	<b>Utility Green Power Product</b>
	<b>Community Choice Aggregation</b>
<p><b>Project-Specific Supply Options:</b></p> <ul style="list-style-type: none"> <li>Generally customized products negotiated between the consumer and supplier.</li> <li>Involve long-term commitments by consumers to purchase a volume tied to the output of a pre-determined generation capacity.</li> <li>The renewable energy project used to supply the product is constant throughout the term of the contract or commitment.</li> </ul>	<b>Self Supply</b>
	<b>Utility Green Tariff</b>
	<b>Shared Renewables</b>
	<b>Physical Power Purchase Agreement</b>
	<b>Financial Power Purchase Agreement</b>



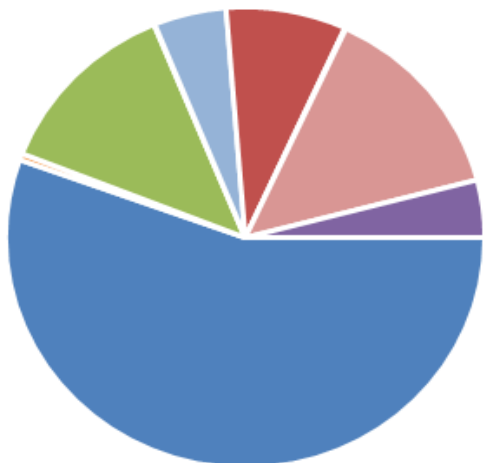
# Partner Green Power Use by Supply Option



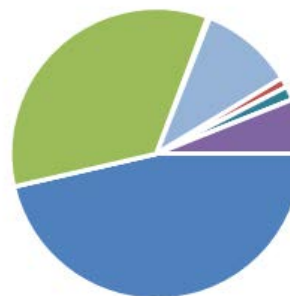


# Partner Green Power Use by Supply Option

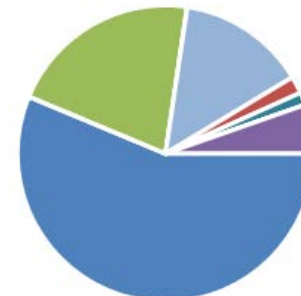
All Partners Together



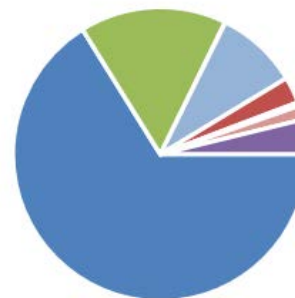
Small Partners



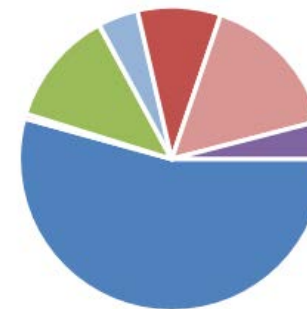
Medium Partners



Large Partners



Very Large Partners



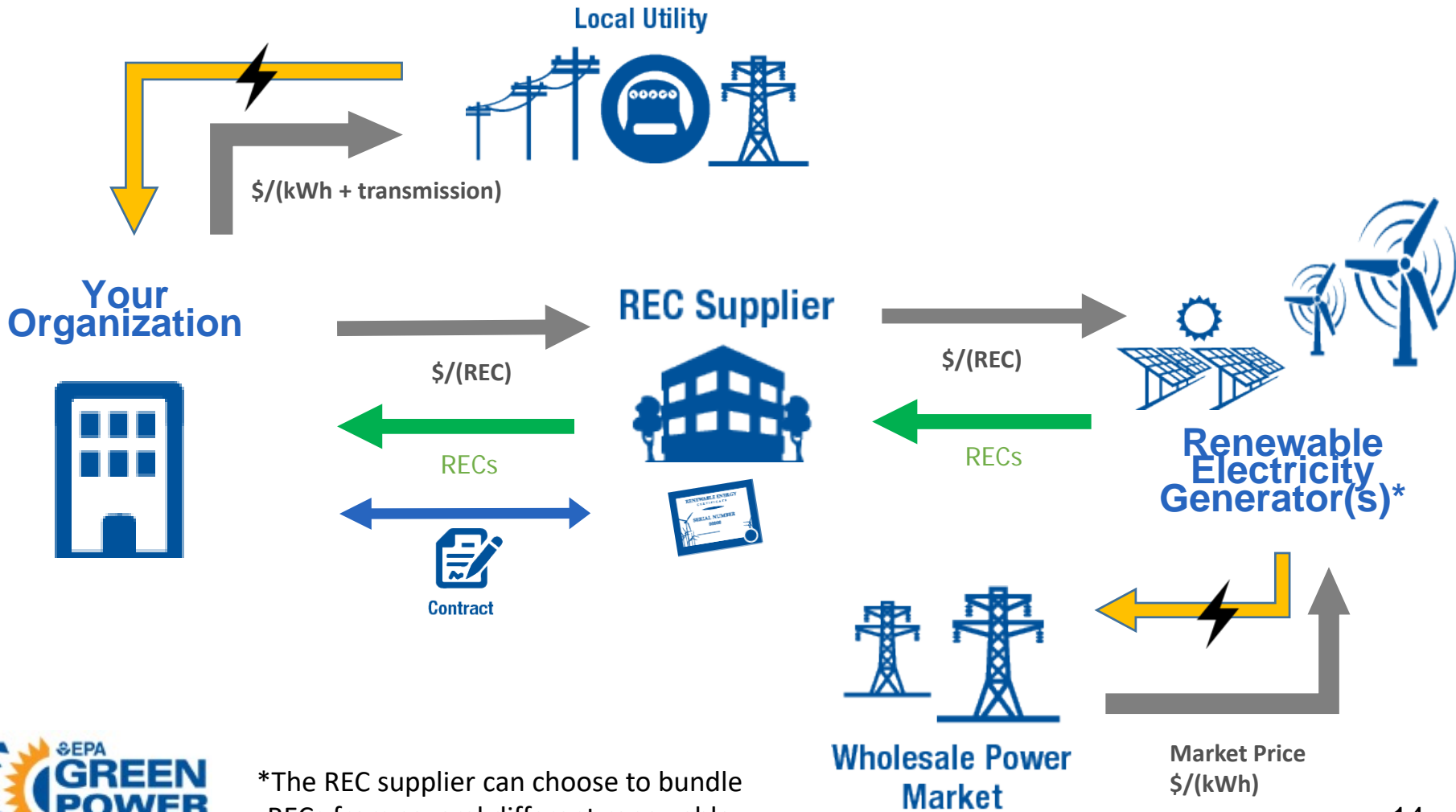
- Unbundled RECs
- Competitive Product
- Utility Product
- CCA
- Self Supply
- Green Tariff
- Shared Renewables
- PPPA
- FPPA



# Unbundled RECs

- RECs that are sold, delivered, or purchased separately from electricity.
- RECs provide no physical delivery of electricity to customers.
- Customer is purchasing power from a separate entity than the one selling them the REC.

# Unbundled RECs



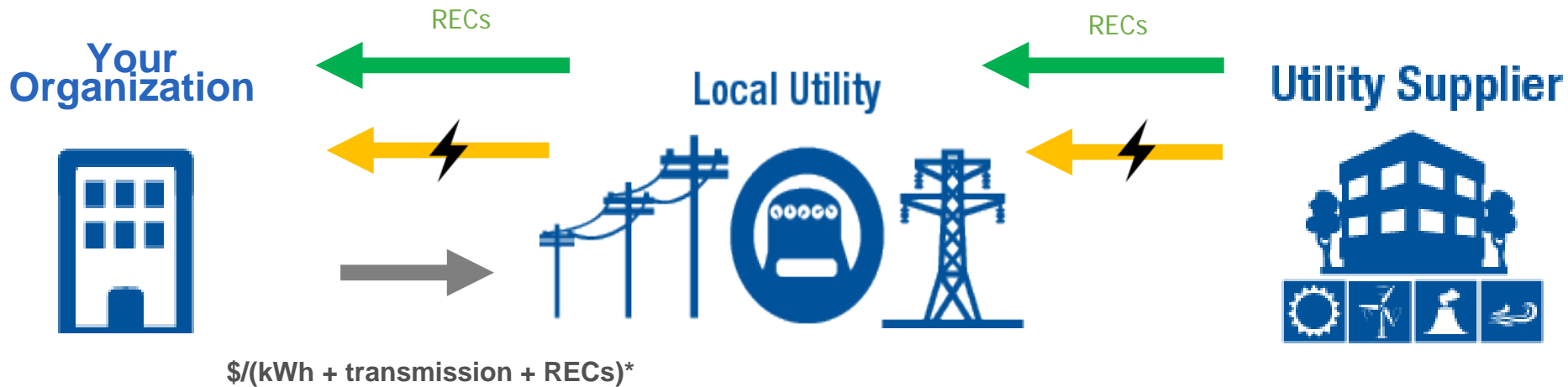
\*The REC supplier can choose to bundle RECs from several different renewable energy generators into one product.



# Utility Green Power Products

- An optional utility service that allows customers to procure bundled electricity and RECs from their utility or default service provider.
- Participating customers usually pay a per-kilowatt-hour premium through an additional line item on their monthly electric utility bill for their renewable electricity.

# Utility Green Power Products



\*Paid for as an additional line item on your standard utility bill.

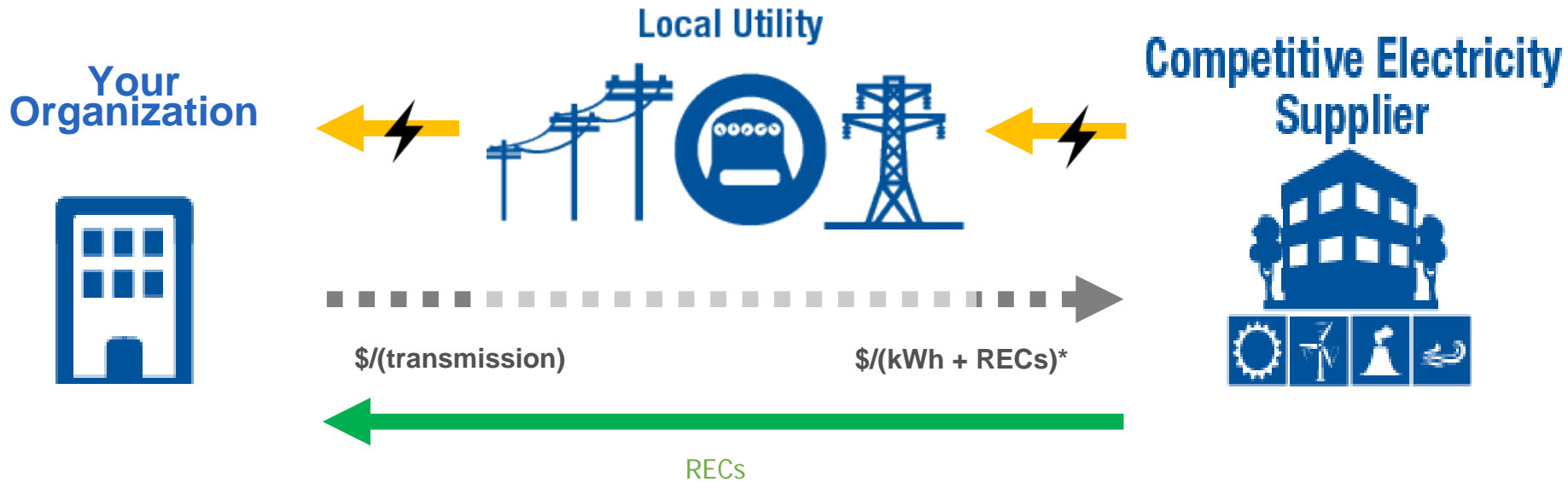




# Competitive Green Power Products

- An optional product offering that allows customers in competitive retail electricity markets to procure bundled electricity and RECs from a competitive electricity supplier, who is not their default utility supplier.
- Participating customers usually pay a per-kilowatt-hour premium on their monthly electric bills for the renewable electricity.

# Competitive Green Power Products



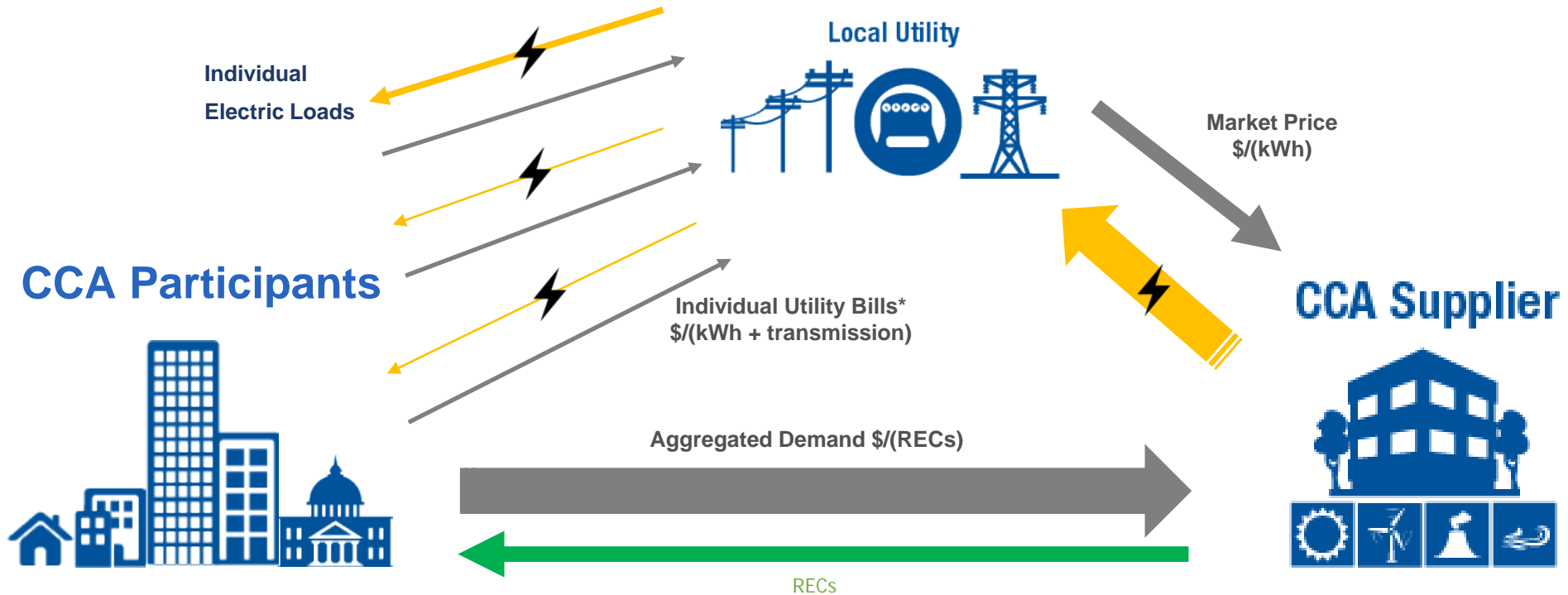
\*With a competitive supplier, you'll pay for electricity through your utility bill, as usual. However, the utility "passes through" payment for electricity supply and RECs on to the competitive supplier.



# Community Choice Aggregation (CCA)

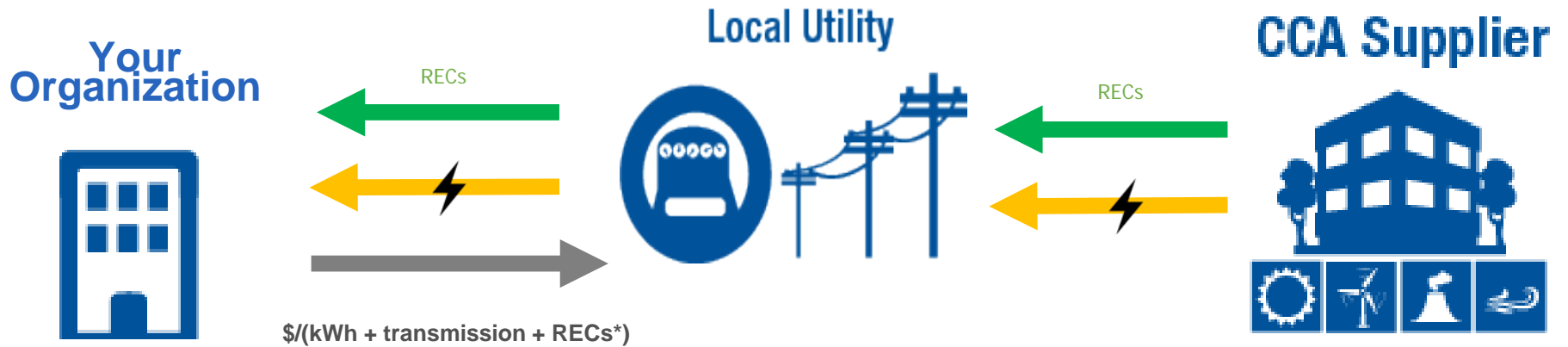
- Programs that allow local governments to procure power on behalf of their residents, businesses, and municipal accounts from an alternative supplier while still receiving transmission and distribution service from their existing utility provider.
- CCAs can, though are not required, to source renewable electricity for their customers, either as a default supply option and/or as an opt-in product
- Currently authorized in California, Illinois, Ohio, Massachusetts, New Jersey, New York, and Rhode Island.

# How Does A CCA Work, Big Picture?



\*Each household, business, or organization still pays its own electric bill through the utility, as usual.

# How does a CCA work for me?



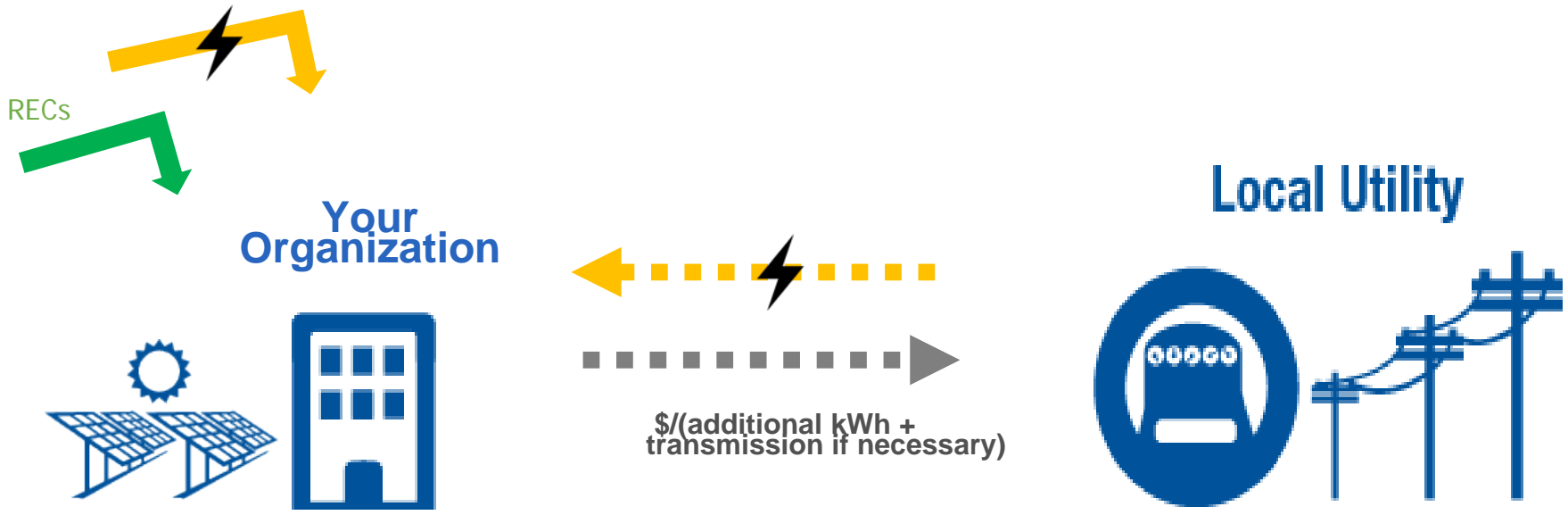
\*You will still pay for transmission through your standard utility bill, but supply will come from the community-chosen supplier.



# Self Supply

- The bundled or unbundled green power used by a consumer whereby the consumer owns the renewable electricity generator and is responsible for its maintenance and operation.
- The renewable electricity generator may be directly connected at or near the point of use, be offsite with the electricity being grid-delivered to the user, or be offsite with the power sold to others but the REC retained by the consumer.

# On-site Self Supply



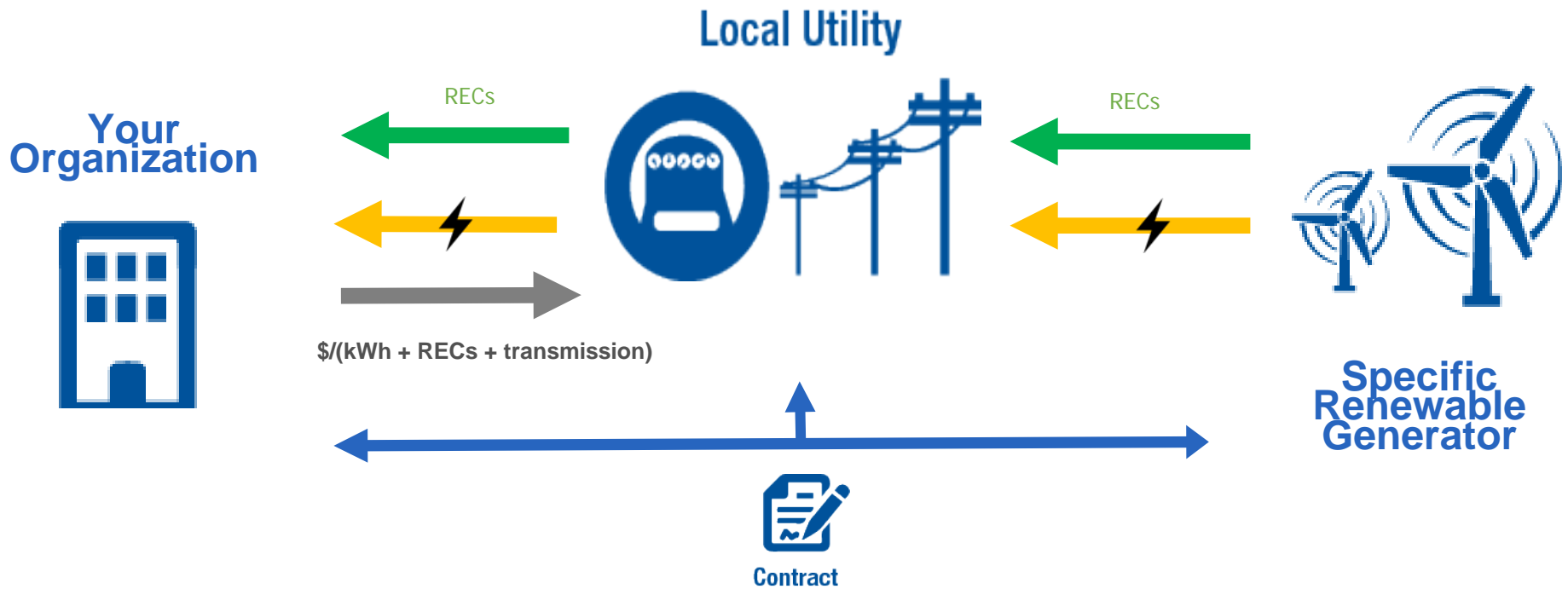


# Utility Green Tariffs

- Optional programs in traditionally regulated electricity markets offered by utilities and approved by state public utility commissions (PUCs)
- Allow eligible large customers to buy bundled renewable electricity from a specific project through a special utility tariff rate.
- As of February 2018, 21 utility green tariffs in 15 states have been proposed or approved.
  - Colorado, Georgia, Kentucky, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Mexico, North Carolina, Utah, Virginia, Washington, Wisconsin, and Wyoming.



# Utility Green Tariffs

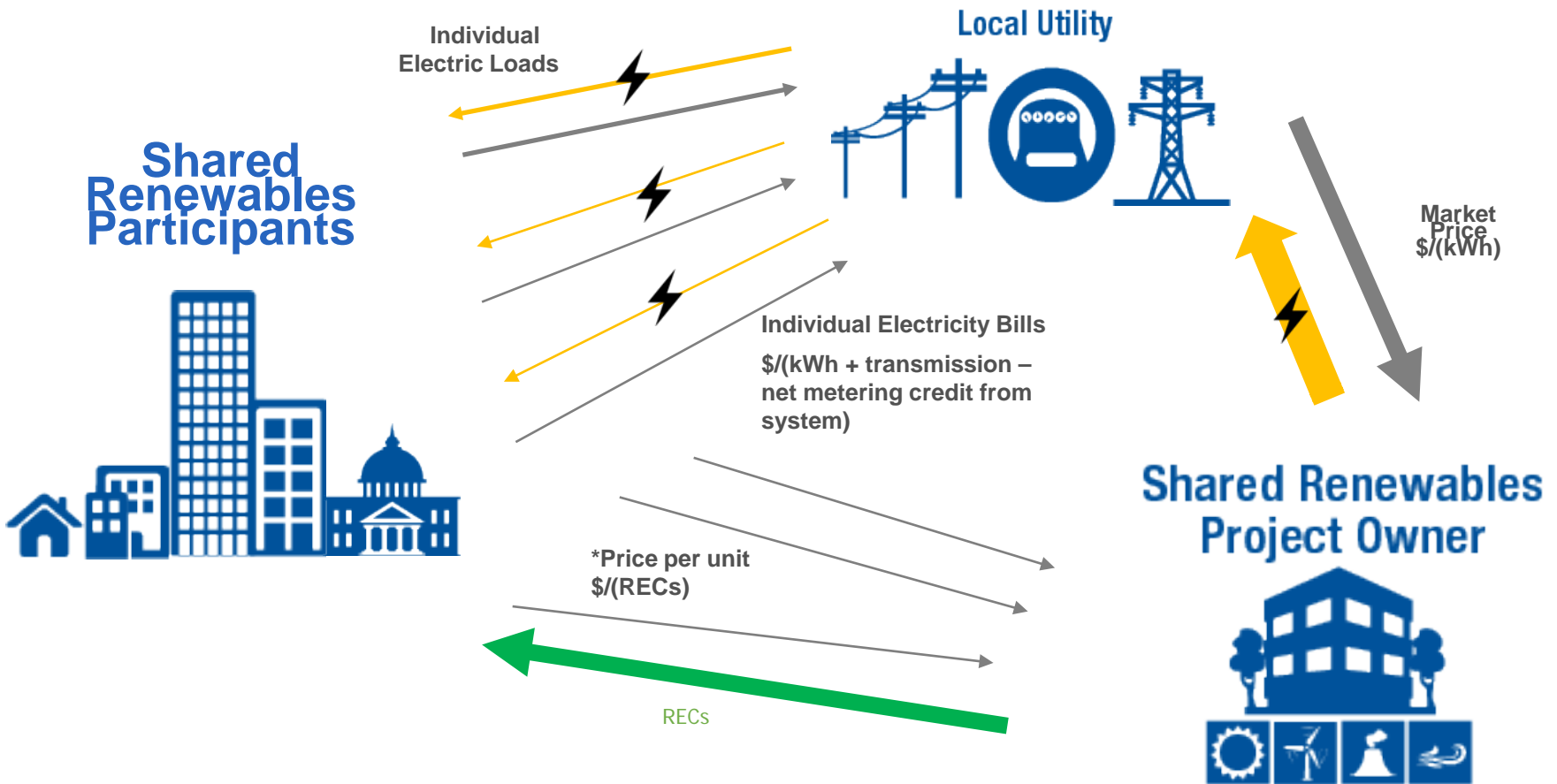




# Shared Renewables

- Also known as “Community Solar,” but can use resources like wind as well
- An emerging model that enables multiple customers to buy, lease, or subscribe to a portion of a shared renewable electricity system
- The system is off-site, located away from their home or business.
- Especially appealing for customers that rent or that are otherwise unable/unwilling to install renewables on their residence or commercial buildings.
- Can be in the form of 'community-owned' projects or third party-owned renewable electricity generators whose electricity is shared with multiple customers.

# How Do Shared Renewable Systems Work, Big Picture?



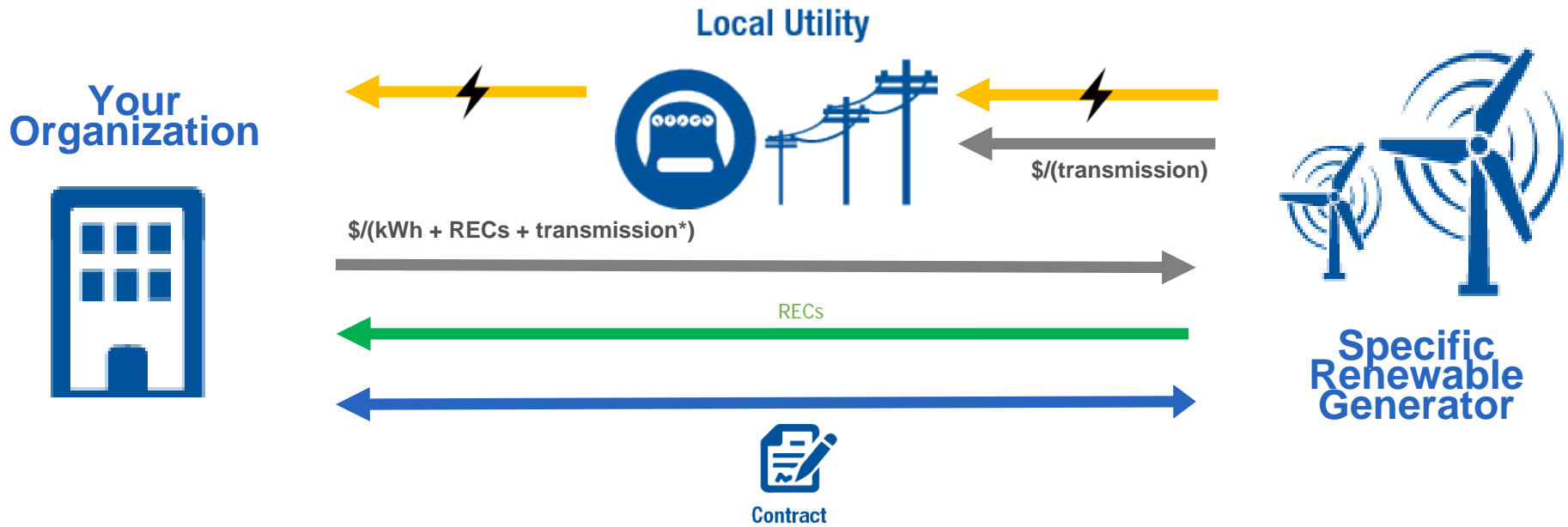
\*Each household or business pays to lease or buy a specific amount from (or percentage of) the shared renewable system.



# Physical PPAs

- A contract for the purchase of power and associated RECs from a specific renewable energy generator (the seller) to a purchaser of renewable electricity (the buyer)
- Usually 10 to 20 year agreements
- Define all of the commercial terms for the sale of renewable electricity between the two parties, including a schedule for delivery of electricity, penalties for under delivery, payment terms, and termination.
- Project can be on- or off-site
- PPAs by non-utility consumers are generally only allowed in competitive electricity markets and the renewable energy generator and customers must be located in the same power market to allow for physical delivery of electricity.

# Physical PPAs

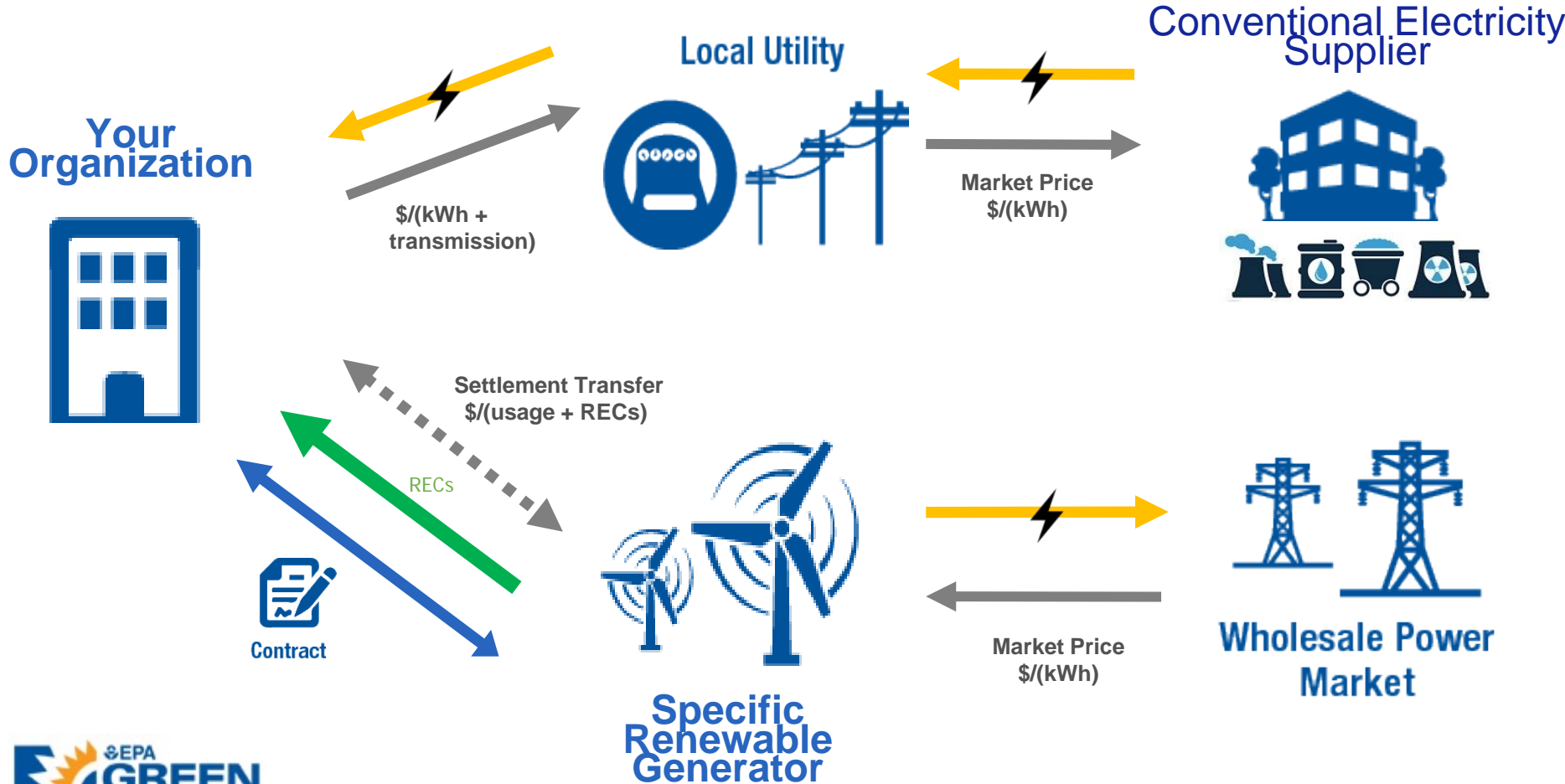




# Financial PPAs

- A financial arrangement between a renewable energy generator (the seller) and a consumer (the buyer)
- Usually 10 to 20 year agreements
- Renewable electricity generator receives a known price for its electricity sales over the term of the agreement, since the buyer is contractually responsible for any difference between the wholesale price and the VPPA price (i.e. strike price)
  - If the wholesale price is below the strike price, the buyer pays the renewable energy generator the difference, and vice versa.
- Contract acts as a hedge against electricity price volatility for the buyer
- Buyer can be located in a different power market than the renewable energy generator, including in a traditionally regulated market, because contract does not include electricity delivery to the buyer.

# Financial PPAs



# Green Power Supply Options Comparison

		Characteristics							
		Simple/Fast Transaction	Cost Savings/Price Hedge	Requires Long-term Commitment	RE Generators Located Onsite	Supports Regional RE Deployment	Direct Impact on New Supply	Supply Option Availability	Reduces Carbon Footprint*
Retail Supply Options	Unbundled RECs	●	○	○	○	○	○	●	●
	Competitive Green Power	●	●	○	○	●	○	●	●
	Utility Green Power	●	○	○	○	●	○	●	●
	Community Choice Aggregation	●	●	○	○	●	○	○	●
Project Specific Supply Options	Self-Supply	○	●	●	●	●	●	●	●
	Shared Renewables	●	●	●	○	●	●	○	●
	Utility Green Tariff	○	●	●	○	●	●	○	●
	Physical PPA	○	●	●	●	●	●	○	●
	Financial PPA	○	●	●	○	○	●	●	●

\*Dependent on REC



<https://www.epa.gov/greenpower/green-power-supply-options-comparison-table>



# Green Power Supply Option Screening Tool

- The purpose of this tool is to help users identify renewable energy procurement options that are likely available to them
- Based on your answers to 5 simple questions, will help identify possible options determined by federal, state and utility policies
- Provides explanation of why certain options may or may not be available
- Answers show likelihood with 9 supply options:
  - self supply,
  - PPAs (on/off site, physical/financial),
  - utility and competitive supply options,
  - community solar,
  - green tariffs,
  - and national unbundled RECs

**Green Power Procurement Option Identification Tool**

The purpose of this tool is to help you identify renewable electricity (e.g., solar, wind) procurement options that might work for your organization.

**DIRECTIONS**

Use the drop-downs below to answer the questions about your organization. Your answers will help identify possible procurement options as determined by details about your organization as well as federal, state, and utility policies. View the viability for your organization of green power procurement options in the results section. To learn more about the procurement option and why or why it doesn't work for your organization, click on the procurement option's respective link.

**SCREENING QUESTIONS**

Please answer the following questions by selecting an option from each drop-down menu:

1. Is your organization a for-profit or a non-profit organization?
2. In what state do you operationally consume your electricity?
3. Is your organization open to directly engaging with offsite projects outside of your state- or the grid-region where you operate?
4. Are you willing to commit to a long-term energy purchase/use of 10+ years?
5. Does your organization use more than 40 million kWh per year?
6. Does your organization have investment grade credit?

**RESULTS: Your Organization's Procurement Options**

Following is a listing of renewable electricity procurement options and whether they are viable for your organization based on your answers to the screening questions. Click the links to learn more details about the different procurement options, including considerations and policy implications.

Project-Specific Procurement Options						Retail Procurement Options		
Onsite Self Supply	Onsite Power Purchase Agreement	Offsite Physical Power Purchase Agreement	Offsite Financial Power Purchase Agreement	Community Solar	Utility Green Tariff	Utility Green Power Product	Competitive Green Power Product	Renewable Energy Certificates
-	-	-	-	-	-	-	-	-



<https://www.epa.gov/greenpower/procurement-tools-resources>





# Questions

- Is your organization a For-Profit or a Non-Profit?
- In what state do you use your electricity?
- Is your organization interested in engaging directly with a project outside your state or grid-region where you operate?
- Are you willing to commit to a long-term (+10 yr) energy purchase?
- Does your organization use more than 40 Million kWh/yr?



# Scenario 1

- Location: Texas
- Organization: Large university
- Investigating whether doing an on or offsite PPA is possible

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### SCREENING QUESTIONS

*Please answer the following questions by selecting an option from each drop-down menu:*

1. Is your organization a for-profit or a non-profit organization?	Non-profit	▼
2. In what state do you operationally consume your electricity?	<a href="#">View State's Policy Landscape &gt;&gt;</a> Texas	▼
3. Is your organization open to directly engaging with offsite projects outside of your state- or the grid-region where you operate?	Yes	▼
4. Are you willing to commit to a long-term energy purchase/use of 10+ years?	Yes	▼
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4. Are you willing to commit to a long-term energy purchase/use of 10+ years?	Yes	▼
5. Does your organization use more than 40 million kWh per year?	Yes	▼
6. Does your organization have investment grade credit?	Yes	▼

## RESULTS: Your Organization's Procurement Options

Following is a listing of renewable electricity procurement options and whether they are viable for your organization based on your answers to the screening questions. Click the links to learn more details about the different procurement options, including considerations and policy implications.

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Onsite Self Supply	Onsite Power Purchase Agreement	Offsite Physical Power Purchase Agreement	Offsite Financial Power Purchase Agreement	Community Solar	Utility Green Tariff	Utility Green Power Product	Competitive Green Power Product	Renewable Energy Certificates
<a href="#">Unlikely</a>	<a href="#">Very Likely</a>	<a href="#">Very Likely</a>	<a href="#">Very Likely</a>	<a href="#">No</a>	<a href="#">No</a>	<a href="#">Unlikely</a>	<a href="#">Very Likely</a>	<a href="#">Yes</a>

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Following are state and utility policies that influence the renewable electricity procurement options available to your organization based on the state where your organization operates. You will need to do additional due diligence in order to validate the efficacy of each procurement option in meeting your specific goals and objectives.

Policy or Market Status>>	Average Commercial Electricity Price (Cents/KWh)	Net Metering Policy Grade*	Inter-connection Policy Grade	Competitive Retail Electricity Market?	Deregulated Wholesale Electricity Market?	3rd-Party Ownership Permitted?	Virtual Net Metering, Community, or Shared Solar Policies?	Utility Green Tariff Access?
Texas	8.15	F	D	Competitive	Competitive	Available	Not Available	Not Available

**Data Source (column):**

Average Commercial Electricity Price: [Energy Information Administration, Electric Power Annual, Table 2.10. Average Price of Electricity to Ultimate Customers by End-Use Sector, by State, 2015](#)

State Policy Grades for Net-Metering & Interconnection: [Vote Solar's "Freeing the Grid" State Policy Assessments](#)

Competitive Retail Markets: [Energy Information Administration, Electricity Retail Choice States, 2010](#)

Deregulated Wholesale Markets: [Federal Energy Regulatory Commission, RTO/ISO map](#)

3rd-Party Ownership Status: [Database for State Incentives for Renewables and Efficiency](#)

Virtual Net-Metering, Community Solar, Shared solar policies: [Shared Renewables, Vote Solar](#)

Utility Green Tariff Status: [World Resources Institute, Green Tariff Brief,](#)

[Buyers Principles Group, Buying Renewable Energy through the Grid](#)





## Green Power Procurement Option Identification Tool

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3. Is your organization open to directly engaging with offsite projects outside of your state- or the grid-region where you operate?	Yes	▼
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6. Does your organization have investment grade credit?	Yes	▼

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# Onsite Self Supply



Refers to green power use by a consumer whereby the consumer owns the renewable electricity generator and is responsible for its maintenance and operation. The renewable electricity generator is directly connected at the point of use.

Viable Procurement Option: Unlikely

## Considerations and Policy Implications

Corporate Status

As a non-profit organization, owning and operating your own onsite self-generation may not be as economically attractive as contracting for generation (i.e., PPA), due to your organization's inability to take advantage of available tax incentives.

Net Metering

An "F" grade in net-metering indicates that your state's net-metering policy scores well below in comparison to Vote Solar's Freeing the Grid model net-metering policy. This suggests that your state's net-metering policy is deficient in several areas that would help facilitate the development of an onsite solar project. Net-metering policies make it possible for intermittent resources, such as solar, to recover the initial capital investment of the project through a retail rate valuation of the electricity that is exported to the grid. Absent a supportive net-metering policy it may be difficult to economically consider onsite solar PV or other renewable projects.

Interconnection

A "D" grade in interconnection indicates that your state is below average in comparison to Vote Solar's Freeing the Grid model interconnection policy. Interconnection standards can have state or even utility specific jurisdiction and may require more specific investigation to understand your own situation. Interconnection standards are the legal rules and procedures for "plugging" a renewable energy system into the power grid. This includes the technical and contractual terms that both system owners and utilities must follow. The primary barrier that interconnection policies pose for onsite systems are the costs involved with complying to the technical and administrative requirements of these policies. A supportive interconnection policy will be designed to accommodate the uniqueness of onsite solar project development and not require steps of the solar project that are more applicable to other generator and resource types. The cost of application for interconnection to the grid should also not be prohibitive. A "D" grade suggests that your state's interconnection policy may pose some challenges for development of an onsite project. You will want to further evaluate this as a potential barrier.

## Green Power Procurement Option Identification Tool

The purpose of this tool is to help you identify renewable electricity (e.g., solar, wind) procurement options that might work for your organization.



### DIRECTIONS

Use the drop-downs below to answer the questions about your organization. Your answers will help identify possible procurement options as determined by details about your organization as well as federal, state, and utility policies. View the viability for your organization of green power procurement options in the results section. To learn more about the procurement option and why or why it doesn't work for your organization, click on the procurement option's respective link.

### SCREENING QUESTIONS

Please answer the following questions by selecting an option from each drop-down menu:

1. Is your organization a for-profit or a non-profit organization?	Non-profit	▼
2. In what state do you operationally consume your electricity? <a href="#">View State's Policy Landscape &gt;&gt;</a>	Texas	▼
3. Is your organization open to directly engaging with offsite projects outside of your state- or the grid-region where you operate?	Yes	▼
4. Are you willing to commit to a long-term energy purchase/use of 10+ years?	Yes	▼
5. Does your organization use more than 40 million kWh per year?	Yes	▼
6. Does your organization have investment grade credit?	Yes	▼

### RESULTS: Your Organization's Procurement Options

Following is a listing of renewable electricity procurement options and whether they are viable for your organization based on your answers to the screening questions. Click the links to learn more details about the different procurement options, including considerations and policy implications.

Project-Specific Procurement Options						Retail Procurement Options		
Onsite Self Supply	Onsite Power Purchase Agreement	Offsite Physical Power Purchase Agreement	Offsite Financial Power Purchase Agreement	Community Solar	Utility Green Tariff	Utility Green Power Product	Competitive Green Power Product	Renewable Energy Certificates
Unlikely	Very Likely	Very Likely	Very Likely	No	No	Unlikely	Very Likely	Yes

## Onsite Power Purchase Agreement

An Onsite Power Purchase Agreement is a financial arrangement in which a third-party developer owns, operates, and maintains the renewable electricity generation system, and a host customer agrees to site the system on its property and purchases the system's electric output from the developer for a predetermined period. This financial arrangement allows the host customer to receive stable and often low-cost electricity, while the developer or another party acquires valuable financial benefits, such as tax credits and income generated from the sale of electricity.

Viable Procurement Option?

Very Likely

### Considerations and Policy Implications

Corporate Status

As a non-profit organization, an onsite power purchase agreement can be an attractive financing option. Under this financing option, a 3rd party develops, owns and operates an onsite solar project at an electricity customer's facility, who in turn agrees to buy the project's power at a known or fixed cost over the term of the PPA contract. The 3rd party project developer pays the upfront capital investment cost of the project, and in exchange receives any available incentives and tax benefits, as well as the revenue from the sale of the project's electricity to the project offtaker (e.g., your organization). The project's offtaker/buyer can also include as part of the PPA contract the option to buy the power's associated environmental attributes (e.g., renewable energy certificates) if the electricity buyer wishes to use "renewable" electricity.

Net Metering

An "F" grade in net-metering indicates that your state's net-metering policy scores well below in comparison to Vote Solar's Freeing the Grid model net-metering policy. This suggests that your state's net-metering policy is deficient in several areas that would help facilitate the development of an onsite solar project. Net-metering policies make it possible for intermittent resources, such as solar, to recover the initial capital investment of the project through a retail rate valuation of the electricity that is exported to the grid. Absent a supportive net-metering policy it may be difficult to economically consider onsite solar PV or other renewable projects. Under a PPA contract, it is the owner of the project (e.g., developer) who must deal with and determine the implications associated with your local jurisdiction's net-metering policy.

Interconnection

A "D" grade in interconnection indicates that your state is below average in comparison to Vote Solar's Freeing the Grid model interconnection policy. Interconnection standards are the legal rules and procedures for "plugging" a renewable energy system into the power grid. This includes the technical and contractual terms that both system owners and utilities must follow. Under a PPA contract, it is the owner of the project (e.g., developer) who must deal with and determine the implications associated with your local jurisdiction's interconnection policy. The primary barrier that interconnection policies pose for onsite systems are the costs involved with complying to the technical and administrative requirements of these policies. A supportive interconnection policy will be designed to accommodate the uniqueness of onsite solar project development and not require steps of the solar project that are more applicable to other generator and resource types. The cost of application for interconnection to the grid should also not be prohibitive. A "D" grade suggests that your state's interconnection policy may pose some challenges for development of an onsite project. You will want to further evaluate this as a potential barrier.

Third-Party Ownership

Your indicated state allows electricity customers to enter into 3rd party ownership contracts for power. Your state's net-metering and interconnection policies also play an important role for enabling onsite projects under a 3rd party agreement, however, it is the project developer's responsibility to determine the impact of these policies on the project.

# Offsite Physical Power Purchase Agreement

An Offsite Physical PPA for renewable electricity is a contract for the purchase of grid-delivered power and associated RECs from a specific offsite renewable energy generator (the seller) to a purchaser of renewable electricity (the buyer). PPAs, which are usually 10 to 20 year agreements, define all of the commercial terms for the sale of renewable electricity between the two parties, including when the project will begin commercial operation, schedule for delivery of electricity, penalties for under delivery, payment terms, and termination. PPAs for non-utility consumers are generally only allowed in competitive electricity markets and the renewable energy generator and customers must be located in the same power market to allow for physical delivery of electricity.

Viability Procurement Option? **Very Likely**

## Considerations and Policy Implications

**Corporate Status**  
Non-profits may not benefit from the added complexity, cost or value proposition that a "physical" or "direct" power purchase agreement (PPA) provides. A physical PPA is similar to other 3rd party arrangements in that the offsite project is developed, owned and operated by a 3rd party, and the electricity from the project is bought by an organization through the PPA contract. Under this contract arrangement, the 3rd party project owner takes advantage of available incentives and tax credits that otherwise would not be available to a nonprofit. A physical or direct PPA can also include the purchase of the project's environmental attributes (e.g., RECs) so that the buyer can claim to be using renewable electricity. A physical or direct PPA allows an organization to engage directly with a specific project and involves contracting for not only the price for the electricity itself, but also the costs for the physical delivery of the power between the generator and the buyer, as well as the option for other system charges such as capacity firming etc. This contract approach also requires that the buyer and the generator be located in the same grid region (e.g., ISO / RTO). Many non-profits may not have the necessary electricity load and power reliability profile to warrant the extra complexity and cost of entering into a physical PPA. This arrangement can be viewed as a generator to load type of contract, which may not be appealing to customers with multiple load centers in different grid regions.

**Interconnection**  
Interconnection standards are the legal rules and procedures for "plugging" a renewable energy system into the power grid. This includes the technical and contractual terms that both system owners and utilities must follow. In the context of a power purchase agreement with a 3rd party, it is the developer, owner and operator of the project who bears the responsibility of understanding the implications of the local interconnection policies, not the offtaker or buyer of the project's generation. Interconnection standards are also state or even utility specific in many cases and would require more specific investigation into your own situation. If the project is located in the same state as where you operate, your state grades below average ("B") against the Vote Solar's Freeing the Grid model interconnection policy, suggesting that projects located in your state may encounter some issues based on your state's interconnection policy.

**Retail Electricity Market Structure**  
Based on your indicated state, your organization operates in a competitive retail choice electricity market. Competitive retail choice offers electricity consumers the flexibility to choose how your power is generated and who you buy it from, which does not limit you to buying your electricity from only your local utility provider.

**Wholesale Electricity Market Structure**  
Based on your indicated state, your organization operates in a competitive wholesale electricity market. To engage in an Offsite Physical PPA, an electricity consumer must be in a competitive retail market and the project must be in a competitive wholesale market that is interconnected with the consumer's independent system operator (ISO) grid region.

## Offsite Financial Power Purchase Agreement

An Offsite Financial Power Purchase Agreement (FPPA), also known as a synthetic power purchase agreement or a contract for differences, is a financial arrangement between a renewable energy generator (the seller) and a consumer (the buyer). FPPAs, which are usually 10 to 20 year agreements, enable the renewable electricity generator to receive a known price for its sales of electricity into the wholesale market over the term of the agreement since the buyer is contractually responsible for any difference between the wholesale price and the FPPA price (i.e. strike price). If the wholesale price is below the strike price, the buyer pays the renewable energy generator the difference. Conversely, if the wholesale price is above the strike price, the renewable energy generator pays the buyer the difference. In this way, the FPPA acts as a hedge against electricity price volatility for the buyer since the FPPA credit the buyer receives is correlated to electricity market prices. The renewable energy certificates generated by the renewable energy generator are usually contractually conveyed to the buyer. A FPPA does not include the physical delivery of power to the buyer, and therefore the buyer can be located in a different power market than the renewable energy generator, including being located in a regulated electricity market.

Viable Procurement Option? **Very Likely**

### Considerations and Policy Implications

#### Corporate Status

Non-profits may be able to benefit from entering into a financial power purchase agreement (FPPA) with an offsite project if they can meet the minimum electricity offtake and credit worthiness requirements. Unlike a physical power purchase agreement, a FPPA is a financial contract for power, meaning that the nonprofit offtaker serves as a counter party to the project output, but does not take physical title or ownership of the project's power or receive physical delivery of the power over the transmission or distribution system. FPPAs are available to any organization, regardless of their state's retail market situation where they operate (e.g., consume electricity). However, a requirement of a FPPA is that the renewable energy project itself must be located in a deregulated wholesale energy market that allows the project to sell its power into the wholesale spot market. A FPPA is similar to other 3rd party arrangements in that the project is developed, owned and operated by a 3rd party, however, under a FPPA the nonprofit offtaker agrees to serve as a counter party to the sale of the project's electricity output. That is, the nonprofit agrees to a FPPA settlement price in the delivery of the project's energy to a particular point on the grid (wholesale market hub). The project owner generates and liquidates the project's energy at the wholesale market price and then settles with the FPPA offtaker at a fixed settlement price defined in the FPPA contract. If the sale of electricity is less than the agreed upon FPPA settlement price, then the offtaker must pay the project owner the difference in price, and if the sales price is greater than the FPPA settlement price, the project owner pays the offtaker. At the end of the contract term, the net sum of payments between parties is equal the FPPA settlement price. The FPPA offtaker can also include a separate contract for the associated environmental attributes (e.g., RECs) from the renewable project. In this way, the FPPA offtaker can associate the RECs with their electricity consumption at their facility in order to substantiate their use of renewable electricity.

#### Interconnection

Interconnection standards are the legal rules and procedures for "plugging" a renewable energy system into the power grid. This includes the technical and contractual terms that both system owners and utilities must follow. In the context of a power purchase agreement with a 3rd party, it is the developer, owner and operator of the project who bears the responsibility of understanding the implications of the local interconnection policies, not the offtaker of the generation.

#### Third-Party Ownership

State authorization regarding 3rd party ownership is not applicable to Financial Power Purchase Agreements (FPPA), since these agreements are financial hedge contracts and do not involved the delivery of electricity to the buyer. Any electricity consumer can enter into a FPPA in order to address their long-term electricity cost risk.

#### Wholesale Electricity Market Structure

To engage in a Financial PPA, an electricity consumer can be located anywhere in the U.S., but the renewable electricity project must be located in a competitive wholesale market. To learn more about competitive wholesale electricity markets, visit: <https://www.epa.gov/greenpower/us-electricity-grid-markets>

## Community Solar



Also referred to as shared renewables, community solar is an emerging model allowing multiple customers to buy, lease, or subscribe to a portion of a shared renewable electricity system that is located away from their home or business. The model is especially appealing to customers that do not have sufficient renewable resource, that rent, or that are otherwise unable or unwilling to install renewables on their residences or commercial buildings. Shared renewables can refer to both 'community-owned' projects as well as third party-owned renewable electricity generators whose electricity is shared with multiple customers.

### Viable Procurement Option?

No

### Considerations and Policy Implications

<b>Corporate Status</b>	Non-profits can benefit from entering into a shared renewable or community solar project. Shared renewable energy arrangements allow several energy customers to share the benefits of one local renewable energy power plant. The shared renewables project pools the investments from multiple members of a community and provides power and/or financial benefits in return. There are several reasons why shared renewables might be preferred for non-profit organizations and even corporations. Organizations that are renting their facility space may be prohibited from installing solar on the property, shared renewables addresses this issue. Many organizations also may not have a feasible site at their facility that allows them to install a renewable project (i.e., roof may be too shaded or is structurally challenged). Last, the capital investment cost for a smaller, individual renewable project may not have the scale to deliver a price for the power to be competitive against the cost of incumbent electricity supply. By aggregating shared renewable demand, one can increase the size of the renewable project and lower the costs for all customers/offtakers involved. There are several different state policy approaches that allow for shared renewables to exist in certain state/utility markets. It is recommended that you investigate the options available to you in your state or utility service territory.
<b>Interconnection</b>	Interconnection standards are the legal rules and procedures for "plugging" a renewable energy system into the power grid. This includes the technical and contractual terms that both system owners and utilities must follow. In the context of a community solar project, it is the developer, owner and operator of the project who bears the responsibility of understanding the implications of the local interconnection policies, not the offtaker of the generation.
<b>Shared or Community Solar</b>	Your indicated <u>state does not</u> currently have enabling legislation to allow for electricity customers to engage with shared renewable projects.

## Utility Green Tariff

Optional programs in regulated markets offered by utilities and approved by state public utility commissions (PUCs) that allow eligible customers to buy bundled renewable electricity from a specific project through a special utility tariff rate. As of September 2016, 10 green tariffs in eight states have been proposed or approved. The states are Colorado, Minnesota, Nevada, New Mexico, North Carolina, Utah, Virginia, and Washington.

Viable Procurement Option?

No

### Considerations and Policy Implications

Corporate Status

Any organization can take advantage of a utility green tariff if it is available and they meet the program's eligibility requirements. A green tariff is a utility program that allows customers to source up to 100 percent of their electricity from renewable sources located on their local grid. Under a green tariff, utilities supply renewable power from projects either owned by the utility or contracted with independent power producers (IPPs) in the local grid or utility region.

Utility Green Tariff

Based on your indicated state, it does not look as though there is a utility that offers a green tariff option.



## Utility Green Power Product

Refers to an optional utility service that allows customers in regulated retail electricity markets to procure bundled renewable electricity. Participating customers usually pay a premium through an additional line item on their electric utility bill.

Viable Procurement Option?

Unlikely

### Considerations and Policy Implications

Retail Electricity Market Structure

Your indicated state has a competitive retail electricity market, whereas "Utility Green Power Products" are only available to consumers in traditionally regulated electricity markets. So, unless your organization operates in a town with a traditionally regulated municipal utility, "Utility Green Power Products" are not available to your organization. However, suppliers in competitive electricity markets sometimes offer renewable electricity products known as "Competitive Green Power Product" products.

## Competitive Green Power Product

Refers to an optional product offering that allows customers in competitive or deregulated retail electricity markets to procure bundled renewable electricity from their default utility supplier, or from an alternative competitive electricity supplier. Participating customers usually pay a premium on their electric bills for the renewable electricity.

Viable Procurement Option?

Very Likely

### Considerations and Policy Implications

Retail Electricity Market Structure

Your indicated state has a competitive retail electricity market that allows for multiple retail suppliers to compete to sell electricity to end-users. Optional renewable electricity products sold by suppliers in competitive electricity markets are known as "Competitive Green Power Product" products.

## Renewable Energy Certificates

RECs are tradeable, market-based instruments that represent the legal property rights to the “renewable-ness” (i.e. environmental attributes) of renewable electricity generation. Since RECs are purchased independently of electricity their procurement by consumers they are available nationally and not limited by the location of the consumer or by individual state policies.

**Viability Procurement Option?**

Yes



## Scenario 2

- Location: Alabama
- Organization: Small non-profit
- Investigating doing an onsite PPA

## Green Power Procurement Option Identification Tool

The purpose of this tool is to help you identify renewable electricity (e.g., solar, wind) procurement options that might work for your organization.



### DIRECTIONS

Use the drop-downs below to answer the questions about your organization. Your answers will help identify possible procurement options as determined by details about your organization as well as federal, state, and utility policies. View the viability for your organization of green power procurement options in the results section. To learn more about the procurement option and why or why it doesn't work for your organization, click on the procurement option's respective link.

### SCREENING QUESTIONS

*Please answer the following questions by selecting an option from each drop-down menu:*

1. Is your organization a for-profit or a non-profit organization?		Non-profit	▼
2. In what state do you operationally consume your electricity?	<a href="#">View State's Policy Landscape &gt;&gt;</a>	Alabama	▼
3. Is your organization open to directly engaging with offsite projects outside of your state- or the grid-region where you operate?		No	▼
4. Are you willing to commit to a long-term energy purchase/use of 10+ years?		Yes	▼
5. Does your organization use more than 40 million kWh per year?		No	▼
6. Does your organization have investment grade credit?	<b>Not Applicable &gt;&gt;</b>	Yes	▼

## Green Power Procurement Option Identification Tool

The purpose of this tool is to help you identify renewable electricity (e.g., solar, wind) procurement options that might work for your organization.



### DIRECTIONS

Use the drop-downs below to answer the questions about your organization. Your answers will help identify possible procurement options as determined by details about your organization as well as federal, state, and utility policies. View the viability for your organization of green power procurement options in the results section. To learn more about the procurement option and why or why it doesn't work for your organization, click on the procurement option's respective link.

### SCREENING QUESTIONS

Please answer the following questions by selecting an option from each drop-down menu:

1. Is your organization a for-profit or a non-profit organization?	Non-profit	▼
2. In what state do you operationally consume your electricity?	<a href="#">View State's Policy Landscape &gt;&gt;</a> Alabama	▼
3. Is your organization open to directly engaging with offsite projects outside of your state- or the grid-region where you operate?	No	▼
4. Are you willing to commit to a long-term energy purchase/use of 10+ years?	Yes	▼
5. Does your organization use more than 40 million kWh per year?	No	▼
6. Does your organization have investment grade credit?	<b>Not Applicable &gt;&gt;</b> Yes	▼

### RESULTS: Your Organization's Procurement Options

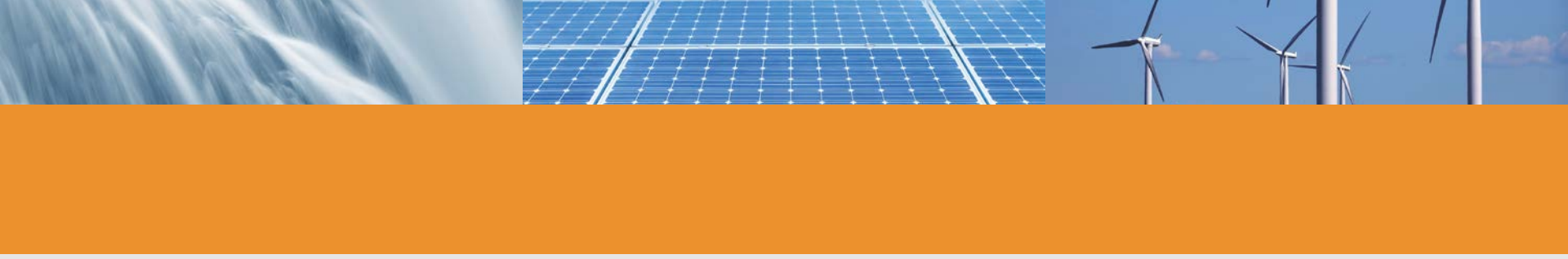
Following is a listing of renewable electricity procurement options and whether they are viable for your organization based on your answers to the screening questions. Click the links to learn more details about the different procurement options, including considerations and policy implications.

Project-Specific Procurement Options						Retail Procurement Options		
Onsite Self Supply	Onsite Power Purchase Agreement	Offsite Physical Power Purchase Agreement	Offsite Financial Power Purchase Agreement	Community Solar	Utility Green Tariff	Utility Green Power Product	Competitive Green Power Product	Renewable Energy Certificates
<a href="#">Unlikely</a>	<a href="#">No</a>	<a href="#">Unlikely</a>	<a href="#">No</a>	<a href="#">No</a>	<a href="#">No</a>	<a href="#">Very Likely</a>	<a href="#">No</a>	<a href="#">Yes</a>



## Scenario 3

- Location: Minnesota
- Large for-profit company
- Has investment-grade credit
- Not sure what type of RE purchase to pursue



## Green Power Supply Options Screening Tool

The purpose of this tool is to help organizations identify possible green power supply options that are available to them. To learn more about the various supply options available in the renewable energy market, visit: <https://www.epa.gov/greenpower/green-power-supply-options>



### DIRECTIONS

Answer the screening questions using the drop-down menus. Your answers will help identify possible supply options based on your organizational details as well as federal, state and utility policies. To learn more about each of the supply options and whether it works for your organization, click on the respective link in the results section at the bottom.

### SCREENING QUESTIONS

*Please answer the following questions by selecting an option from each drop-down menu:*

1. Is your organization a for-profit or a non-profit organization?	For-profit	▼
2. In what state does your organization operationally consume electricity? <a href="#">View State's Policy Landscape &gt;&gt;</a>	Minnesota	▼
3. Is your organization open to procuring renewables from offsite projects outside of your state or the grid-region where you operate?	Yes	▼
4. Is your organization willing to commit to a long-term energy purchase/use of 10+ years?	Yes	▼
5. Does your organization use more than 40 million kWh per year of electricity?	Yes	▼
6. Does your organization have investment grade credit?	Yes	▼





## Green Power Supply Options Screening Tool

The purpose of this tool is to help organizations identify possible green power supply options that are available to them. To learn more about the various supply options available in the renewable energy market, visit: <https://www.epa.gov/greenpower/green-power-supply-options>



### DIRECTIONS

Answer the screening questions using the drop-down menus. Your answers will help identify possible supply options based on your organizational details as well as federal, state and utility policies. To learn more about each of the supply options and whether it works for your organization, click on the respective link in the results section at the bottom.

### SCREENING QUESTIONS

*Please answer the following questions by selecting an option from each drop-down menu:*

1. Is your organization a for-profit or a non-profit organization?	For-profit	▼
2. In what state does your organization operationally consume electricity? <a href="#">View State's Policy Landscape &gt;&gt;</a>	Minnesota	▼
3. Is your organization open to procuring renewables from offsite projects outside of your state or the grid-region where you operate?	Yes	▼
4. Is your organization willing to commit to a long-term energy purchase/use of 10+ years?	Yes	▼
5. Does your organization use more than 40 million kWh per year of electricity?	Yes	▼
6. Does your organization have investment grade credit?	Yes	▼

### RESULTS: Your Organization's Supply Options

Following is a listing of green power supply options and whether they are viable for your organization based on your answers to the screening questions. Click the links to learn more details about the different procurement options, including considerations and policy implications.

Project-Specific Supply Options						Retail Supply Options		
Onsite Self Supply	Onsite Power Purchase Agreement	Offsite Physical Power Purchase Agreement	Offsite Financial Power Purchase Agreement	Community Solar	Utility Green Tariff	Utility Green Power Product	Competitive Green Power Product	Renewable Energy Certificates
Possibly	Possibly	Unlikely	Very Likely	Very Likely	Possibly	Very Likely	No	Yes

Click links for more details >>





# Questions?

Christopher Kent

U.S. EPA's Green Power Partnership

[kent.christopher@epa.gov](mailto:kent.christopher@epa.gov)

## Resources:

Supply Options Webpage

<https://www.epa.gov/greenpower/green-power-supply-options>

Green Power Supply Options Comparison Table

<https://www.epa.gov/greenpower/green-power-supply-options-comparison-table>

Procurement Tools & Resources

<https://www.epa.gov/greenpower/procurement-tools-resources>

