VOLUNTARY RENEWABLE ENERGY MARKETS 101

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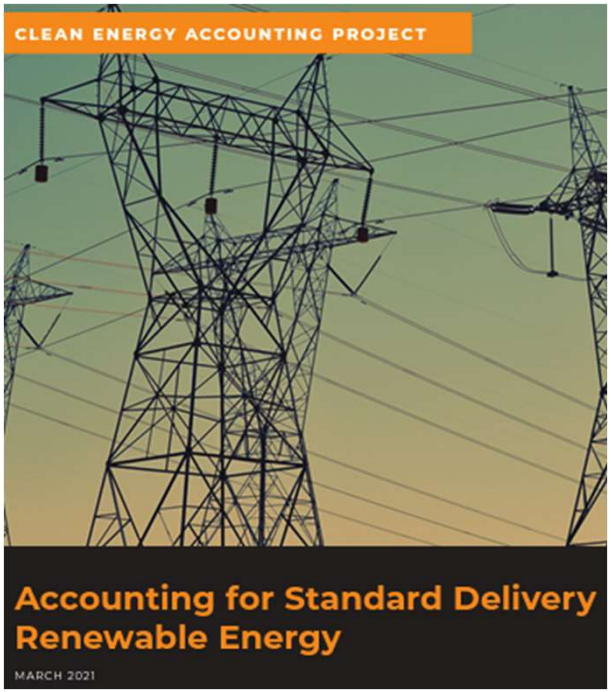
About Center for Resource Solutions

Non Governmental Organization (NGO) creating policy and market solutions to advance sustainable energy since 1997.

- Expert assistance resource for corporate buyers
- Renewable energy and climate policy
  - Clean Energy Accounting Project (CEAP)
- Renewable Energy Markets annual conference
- Green-e® certification for suppliers and users of renewable energy, carbon offsets and biomethane in the voluntary market



The Basics.

Renewable Resource Types

- Solar
- Wind
- Geothermal
- Biomass
- Hydroelectric

Capacity (MW) vs. Output (MWh)

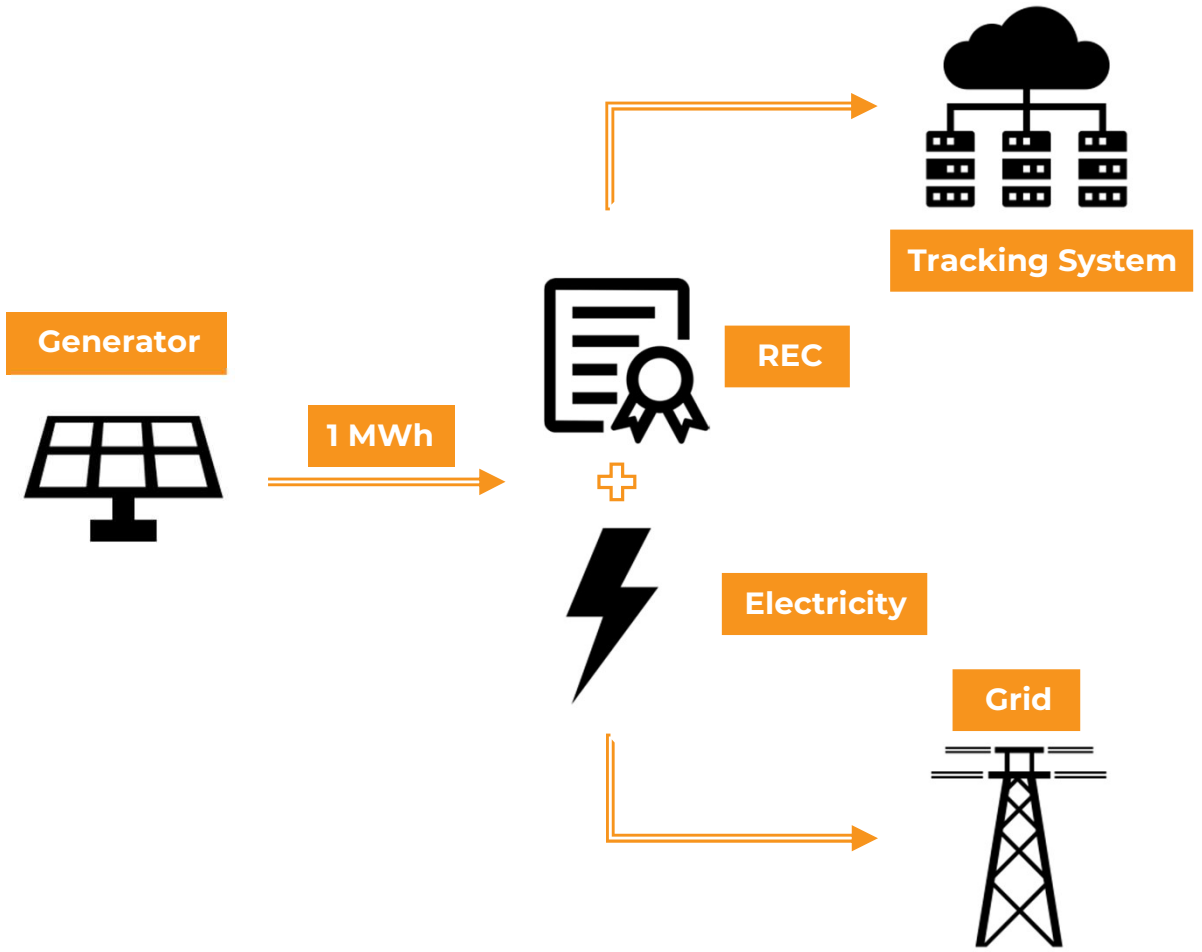
Measuring Energy

1 Megawatt hour = 1000 Kilowatt hours

Graphic Source: Climate Council
https://www.climatecouncil.org.au/resources/the-difference-between-installed-capacity-mw-and-energy-generation-mwh/

Renewable Energy Certificates (RECs)

1 REC represents the renewable attributes of 1 MWh of renewable energy generation

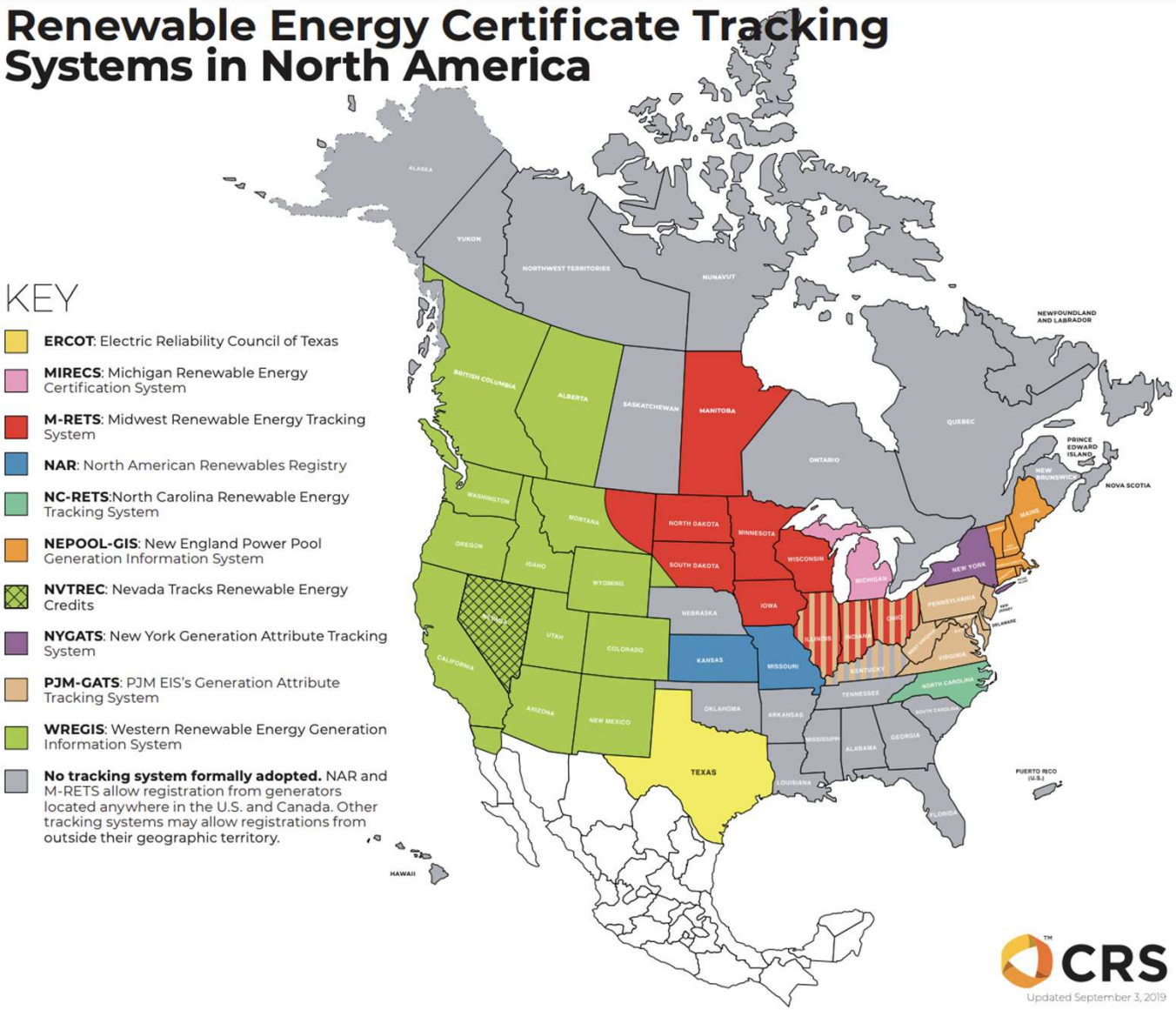


RECs

are needed to:

1. Allocate and claim use of renewable generation on a shared grid
   — For both the voluntary and regulatory market
2. Avoid double counting and double claiming
3. Create a national market for renewable energy

Renewable Energy Certificate Tracking Systems in North America



Attribute Tracking

- Databases used to track, trade, and "retire" RECs
- Claims are substantiated with retired RECs
- Used for both voluntary and compliance markets

All renewable energy procurement methods involve RECs

Self Generation

(Lease and Own Generation)

- Onsite self-generation or lease
- Offsite self-generation or lease

Direct Purchasing

(Purchase from a Generator)

- Onsite PPA
- Offsite physical PPA
- Virtual PPA
- Direct attribute-only purchase

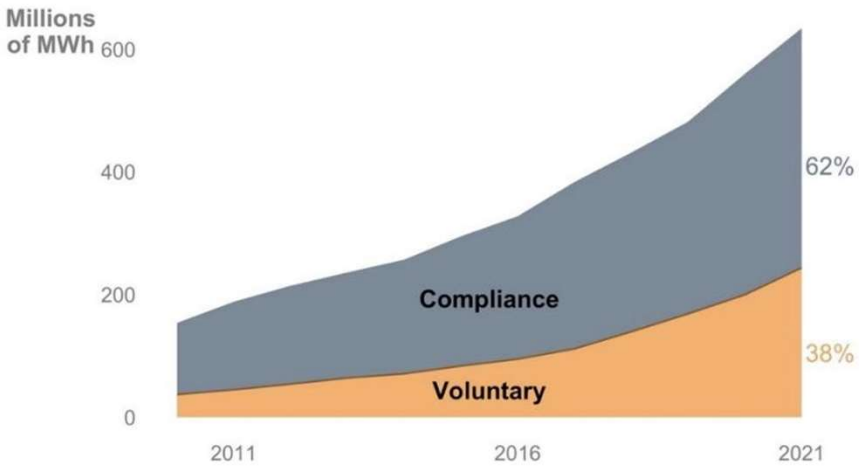
Retail Purchasing

(Purchase from a Supplier or Utility)

- Utility green pricing
- Competitive green power
- Community renewables
- Direct access tariff
- Unbundled certificates

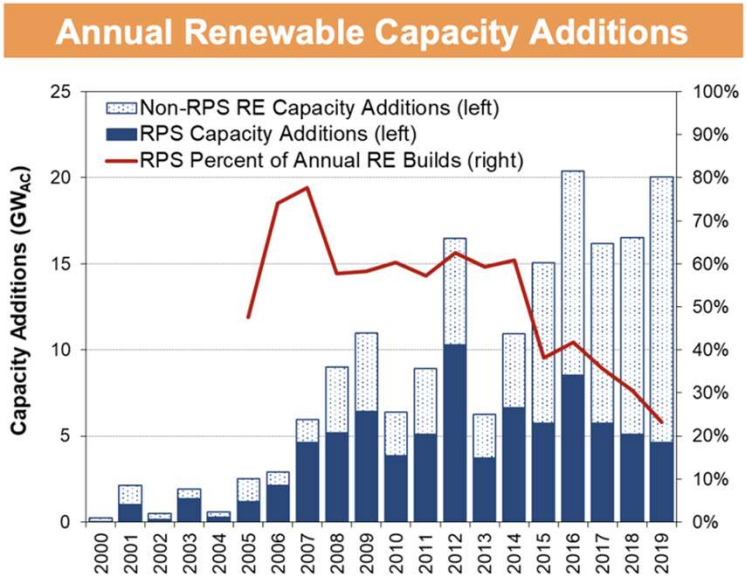
U.S. Voluntary Renewable Energy Market

Renewable energy sales in voluntary, compliance, and other markets, 2011–2021



Source: National Renewable Energy Laboratory
https://www.nrel.gov/docs/fy23osti/86162.pdf

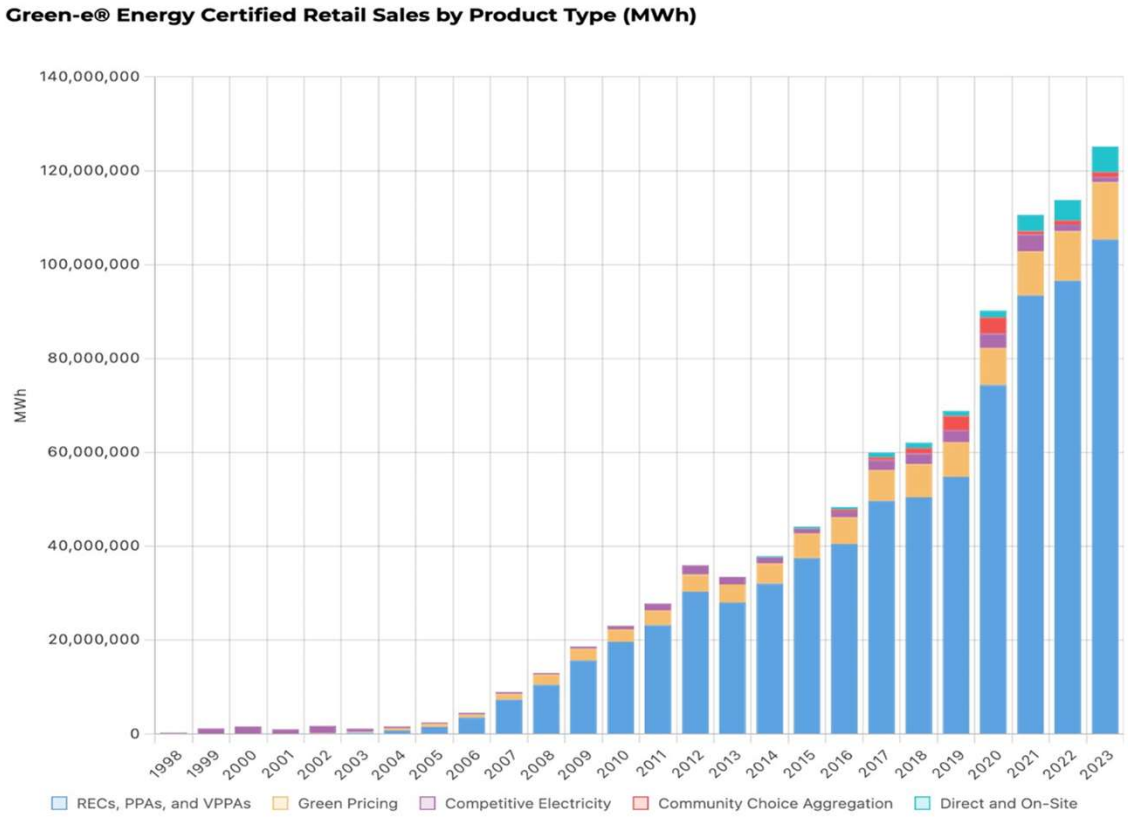
Renewable Capacity Additions, 2000–2019



Source: Lawrence Berkeley National Laboratory
https://eta-publications.lbl.gov/sites/default/files/rps_status_update-2021_early_release.pdf

Green-e® Certification

Green-e® Certified Renewable Energy



Full Verification Report Data: www.resource-solutions.org/g2023/

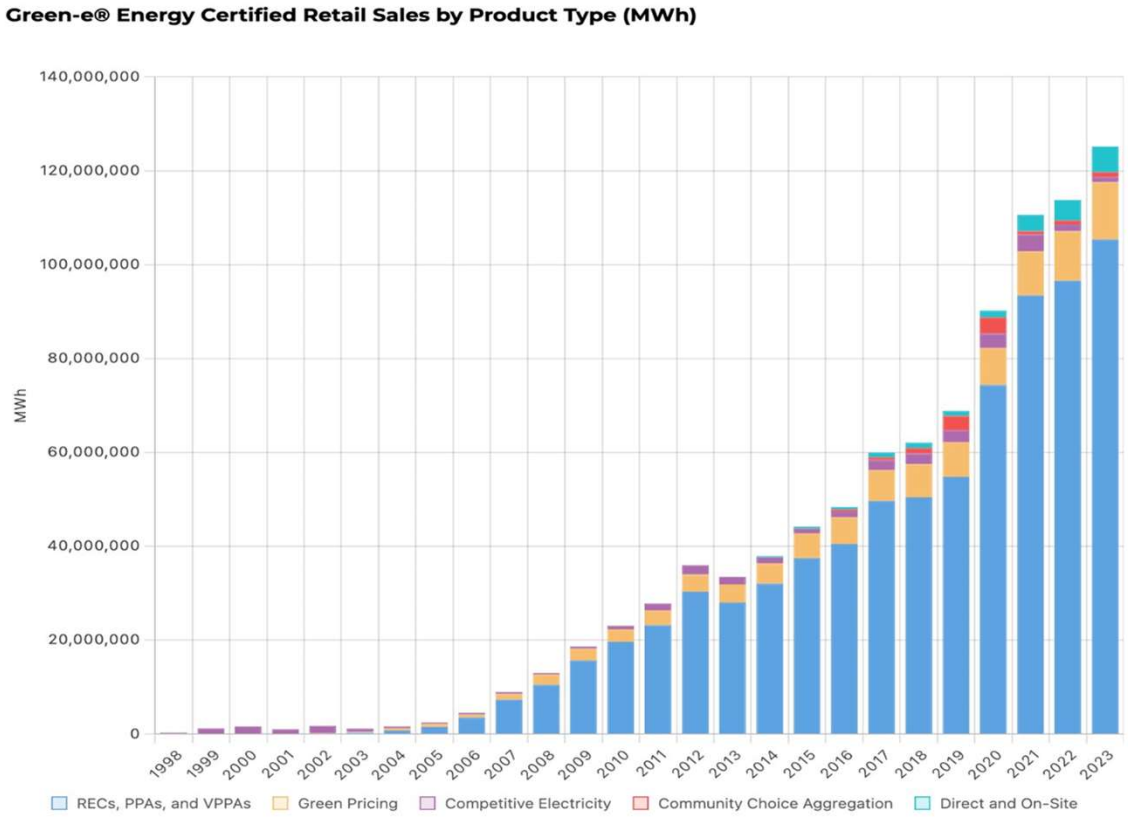
CRS

Buyer protections for voluntary renewable electricity purchases

- Green-e® Energy Standard and Code of Conduct
- Independent Governance Board
- From newer generators meeting environmental requirements
- Third-party Audit of:
  - REC retirements
  - Seller disclosures

Green-e®

Green-e® Certified Renewable Energy



Full Verification Report Data: www.resource-solutions.org/g2023/

CRS

Buyer protections for voluntary renewable electricity purchases

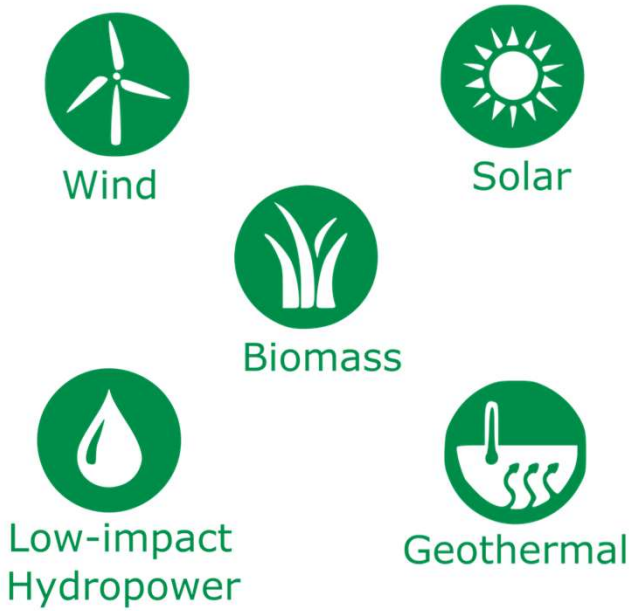
By the Numbers

- More than **125 million** MWh
- **1.3 million** retail purchasers, of those, 298,000 were businesses
- New renewables

Green-e®

Supply Must Meet the Green-e® Standard

- 15-year “New Date”
- Must be surplus to regulation
- No double counting, selling or claiming
- GHG reduction benefits must be included
- State-specific requirements and restrictions
- Vintage requirements



Q&A

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NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Voluntary Renewable Energy Markets 101 Workshop

Sushmita Jena
National Renewable Energy Laboratory
16 September 2024

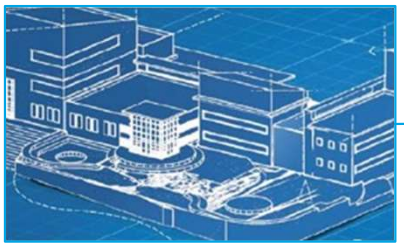
Renewable Energy Markets Conference 2024
Denver, Colorado

NREL Brings Distinct Capabilities

Foundational Science
Bench-scale- discovery

Solar Energy Research Facility
Science and Technology Facility
Field Test Laboratory Building

Accelerated Technology Scale-Up
Scaling R&D and Process Engineering

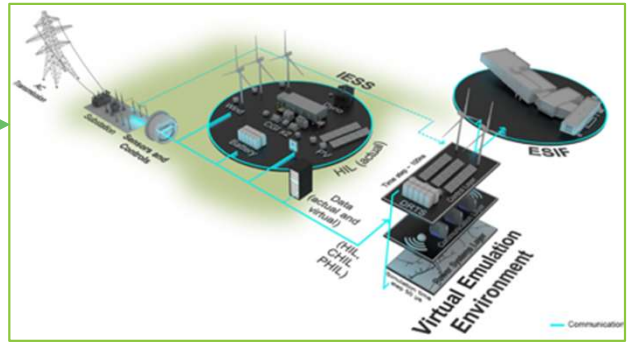


Energy Materials and Processing at Scale (Completion 2025)

Energy Systems Integration Facility

- Carbon-free H2
- Products from electrochemical processes and CO2
- Advanced Batteries
- PV, Wind, Water Power, Geothermal
- New Buildings and Industrial Materials, Manufacturing and Systems
- Grid and security tech

Systems
Markets
R&D with Industry Partners



Advanced Research on Integrated Energy Systems

High-Performance Computing, Simulation, and Visualization

NREL at a Glance

3,343 workforce, including:

- 2,482 regular/limited term
- 485 contingent workers
- 183 postdoctoral researchers
- 125 graduate students
- 68 undergraduate students

—as of 12/31/2022

World-class research expertise in:

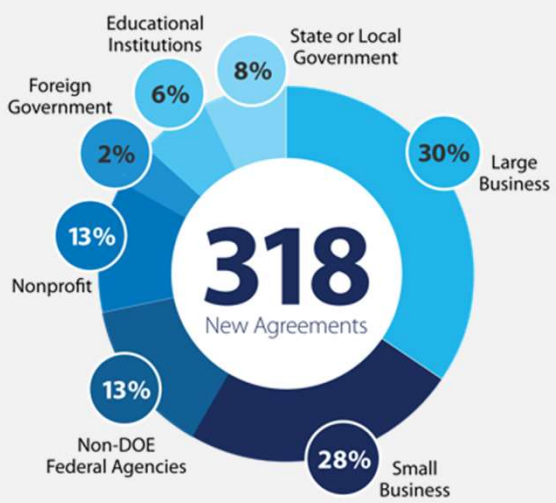
- Renewable Power
- Energy Efficiency
- Sustainable Transportation
- Energy Systems Integration

Partnerships with:

- Industry
- Academia
- Government

3 campuses operate as living laboratories

More Than 1,000 Active Partnerships in FY 2022



Agreements by Business Type

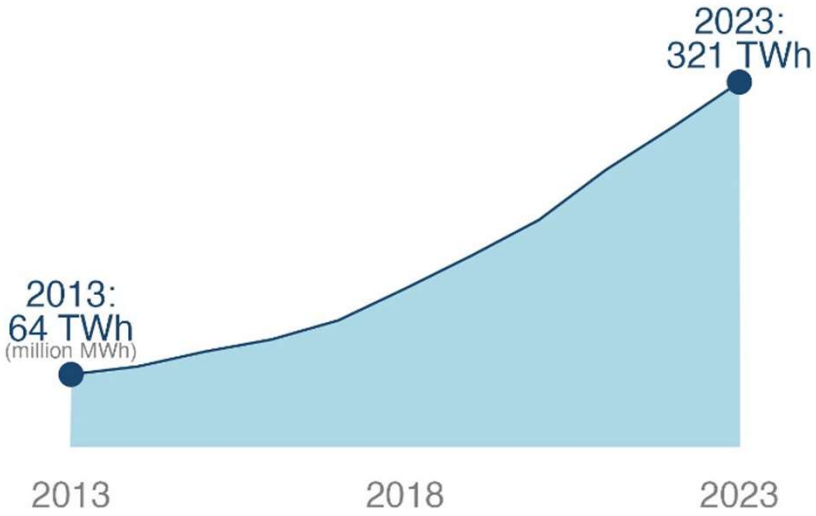
Funding by Business Type

Voluntary Green Power Markets

- Voluntary green power refers to renewable electricity **voluntarily** purchased by **retail** electricity customers
- The voluntary green power market refers to the suite of products that allow customers to procure green power:
  - Utility green pricing programs
  - Utility renewable contracts
  - Competitive suppliers
  - Unbundled RECs
  - Community choice aggregation
  - Power purchase agreements

The Big Picture

In 2023, about **9.9 million customers** procured about **321 million MWh** of renewable energy through green power markets.



Total green power sales 2013-2023 (million MWh)

That represents about:

1 in 16
U.S. retail electricity customers

8%
of U.S. retail electricity sales

44%
of U.S. non-hydro renewable energy generation

Note: Estimates compiled from survey data and various data providers including the Energy Information Administration, Center for Resource Solutions, and Bloomberg New Energy Finance

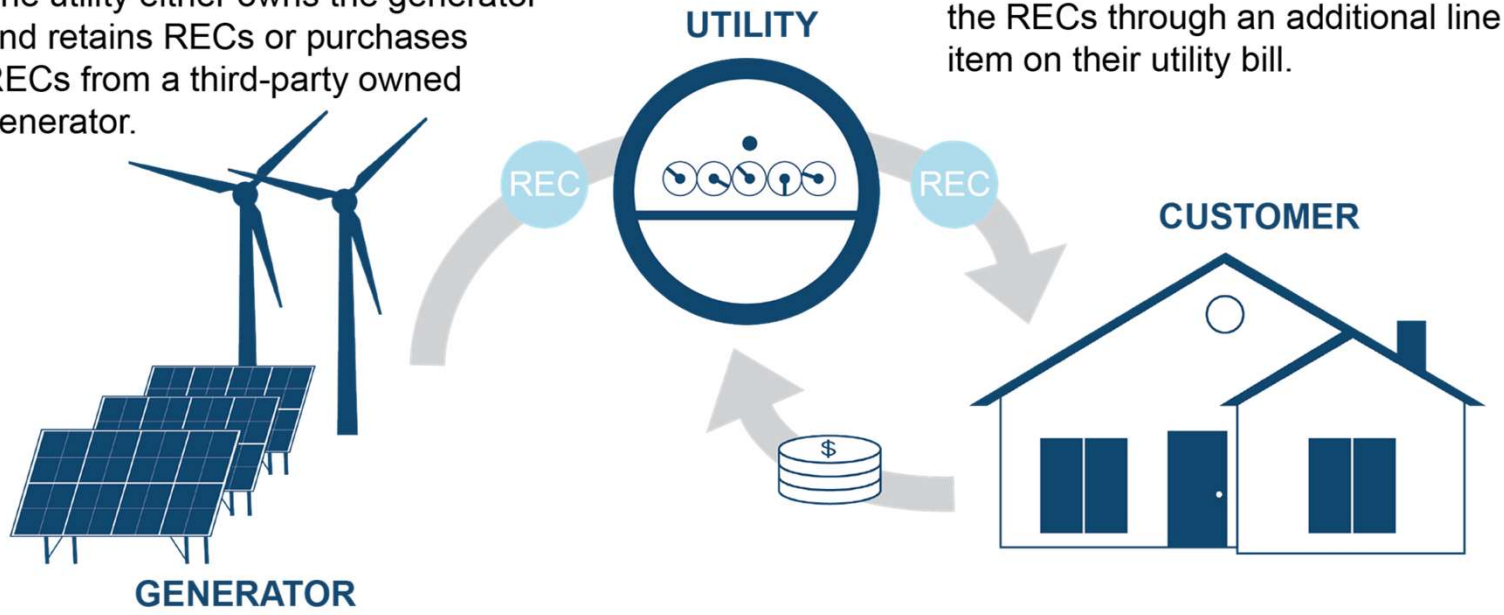
The Supply Mechanisms

Utility Green Pricing

Renewable Energy Certificate (REC): Environmental attributes from one MWh of renewable generation

Utility green pricing programs begin with a renewable energy generator. The utility either owns the generator and retains RECs or purchases RECs from a third-party owned generator.

The utility retires the RECs on behalf of green pricing customers, who pay for the RECs through an additional line item on their utility bill.



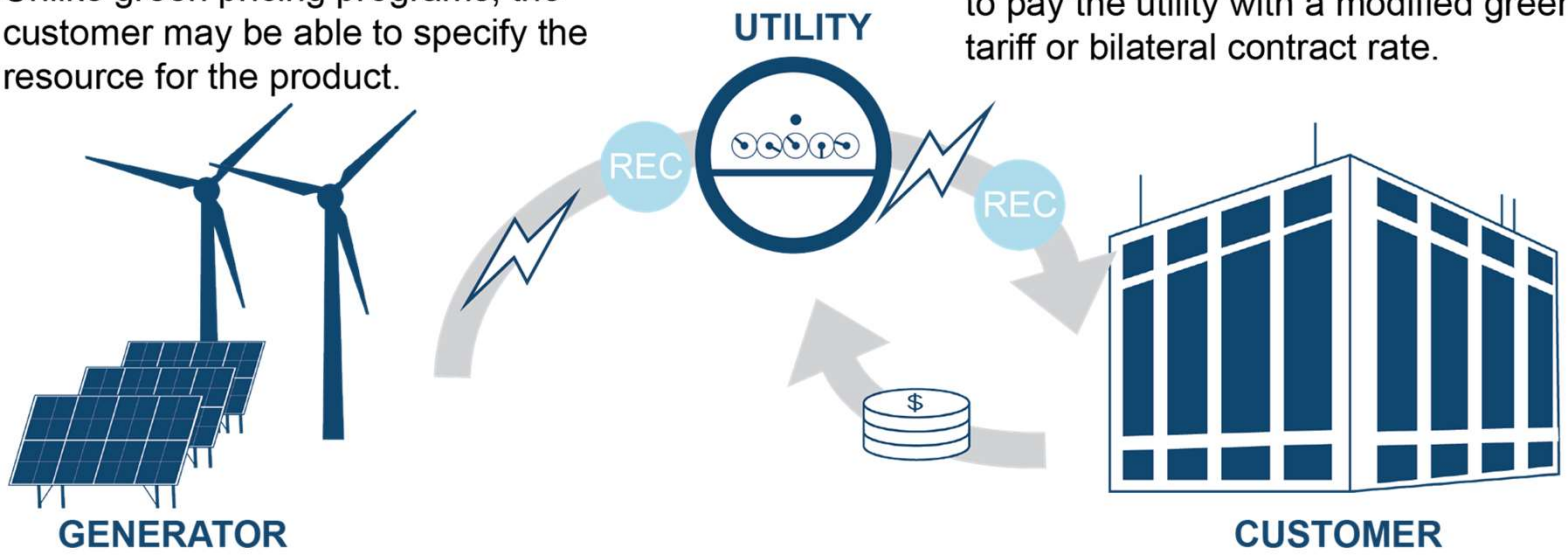
Basic utility green pricing program structure

Specific program structures vary

Utility Renewable Contracts

In a utility renewable contract, the customer enters into a contract with the utility to procure power and RECs from a renewable energy provider. Unlike green pricing programs, the customer may be able to specify the resource for the product.

The utility provides the power and RECs to the customer. The customer continues to pay the utility with a modified green tariff or bilateral contract rate.



Basic utility renewable contract structure

Specific program structures vary

Comparing Green Pricing & Green Tariffs

Comparison of Green Pricing vs. Green Tariffs

- Green tariff products have a longer contract term and potential utility cost savings, while green pricing products involve a premium and shorter contract term.
- Some convergence of products is occurring (e.g. green tariffs that have some attributes of green pricing, like shorter contract lengths).

Program Characteristics	Green Pricing	Green Tariff
Cost savings potential	No, products average around 1.5 cents/kWh premium	May be cost-competitive, depending on structure and term
Price stability	No, continue to pay utility rate that is subject to change	Possible under certain program structures
Contract length	Shorter contract terms (typically month-to-month)	Longer agreements possible (10-20 years)
Ease of joining	Typically a simple sign-up process	Often limited availability, longer contract is potential barrier
Choice of RE resource	Utility determines	Customer may have input

Competitive Suppliers

In restructured electricity markets, customers may choose a competitive electricity supplier that offers a green power product.

The competitive supplier provides the customer with power and RECs. The utility remains responsible for transmission and distribution. The competitive supplier may charge a premium for the green power product.

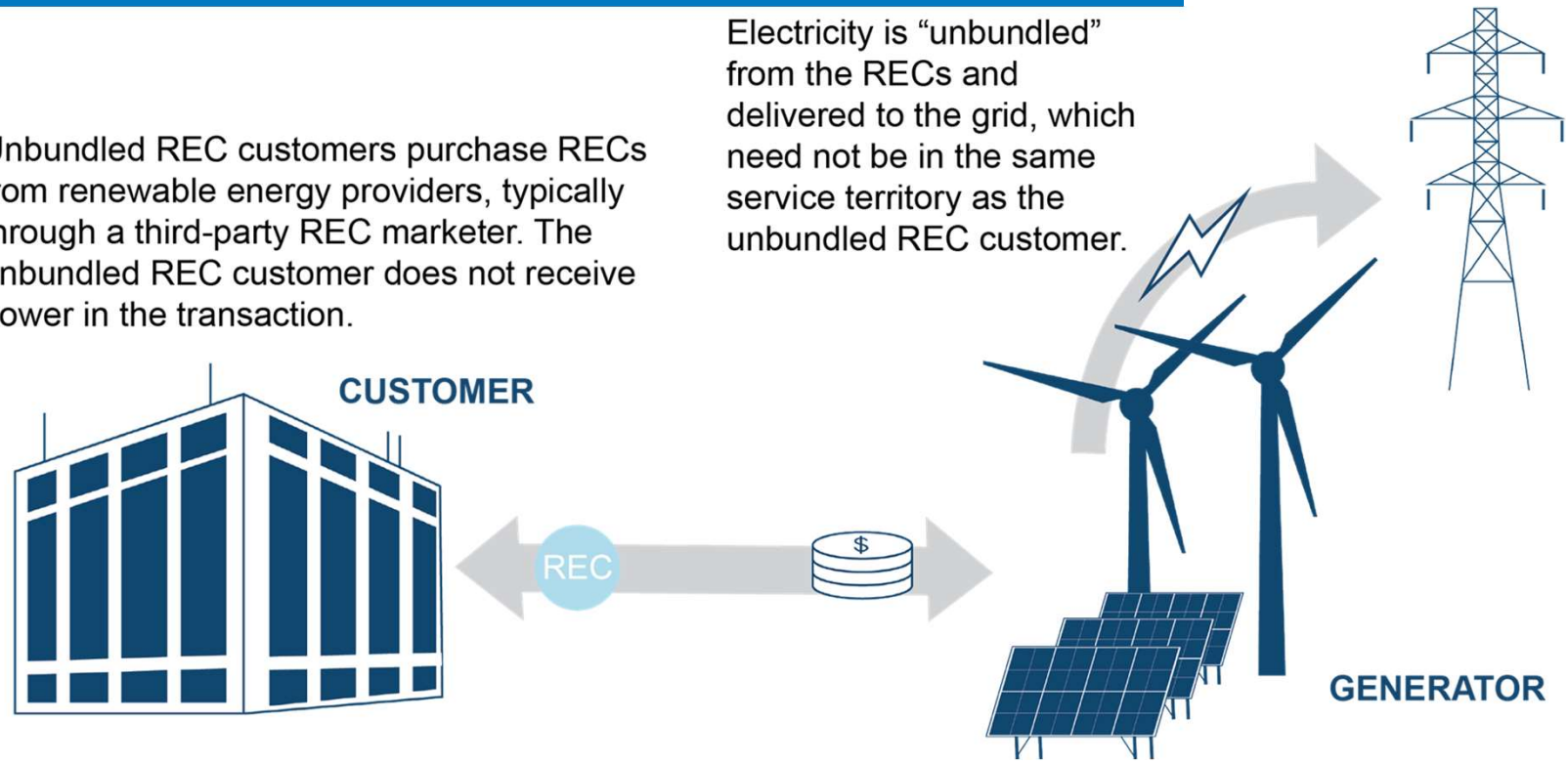
Basic competitive supplier sales structure

Specific program structures vary

Unbundled RECs

Unbundled REC customers purchase RECs from renewable energy providers, typically through a third-party REC marketer. The unbundled REC customer does not receive power in the transaction.

Electricity is "unbundled" from the RECs and delivered to the grid, which need not be in the same service territory as the unbundled REC customer.



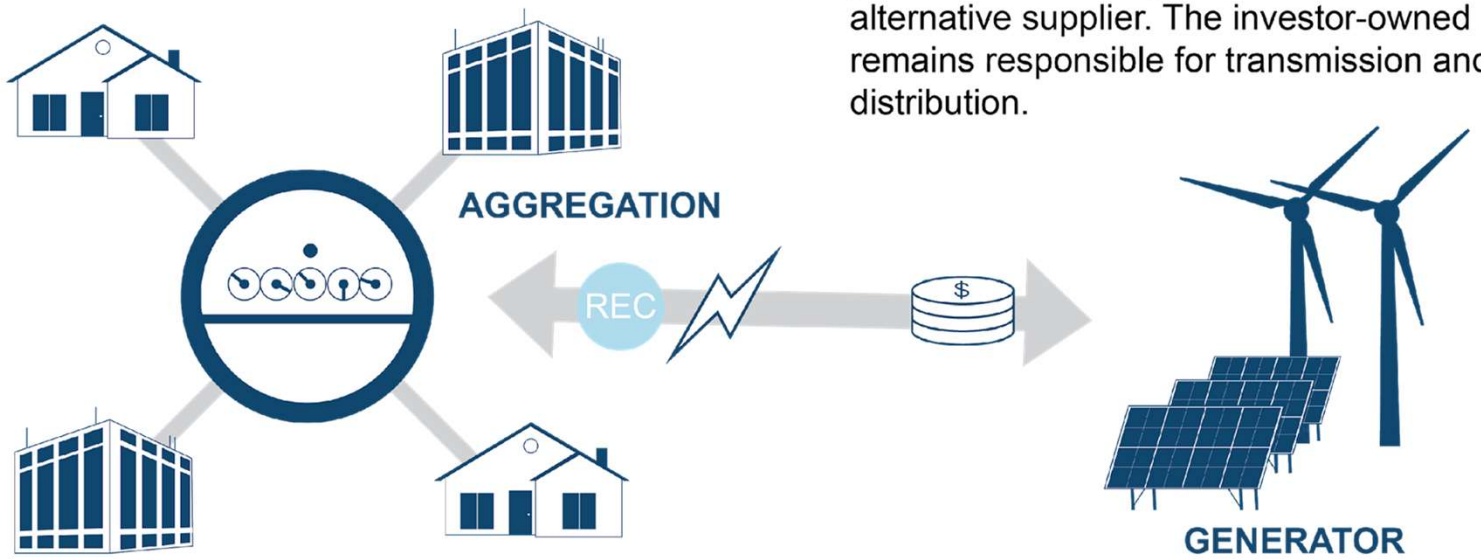
Basic unbundled RECs sales structure

Specific program structures vary

Community Choice Aggregation

A CCA effectively "aggregates" the electricity demand of many customers (residential and non-residential) in order to procure electricity from an alternative supplier.

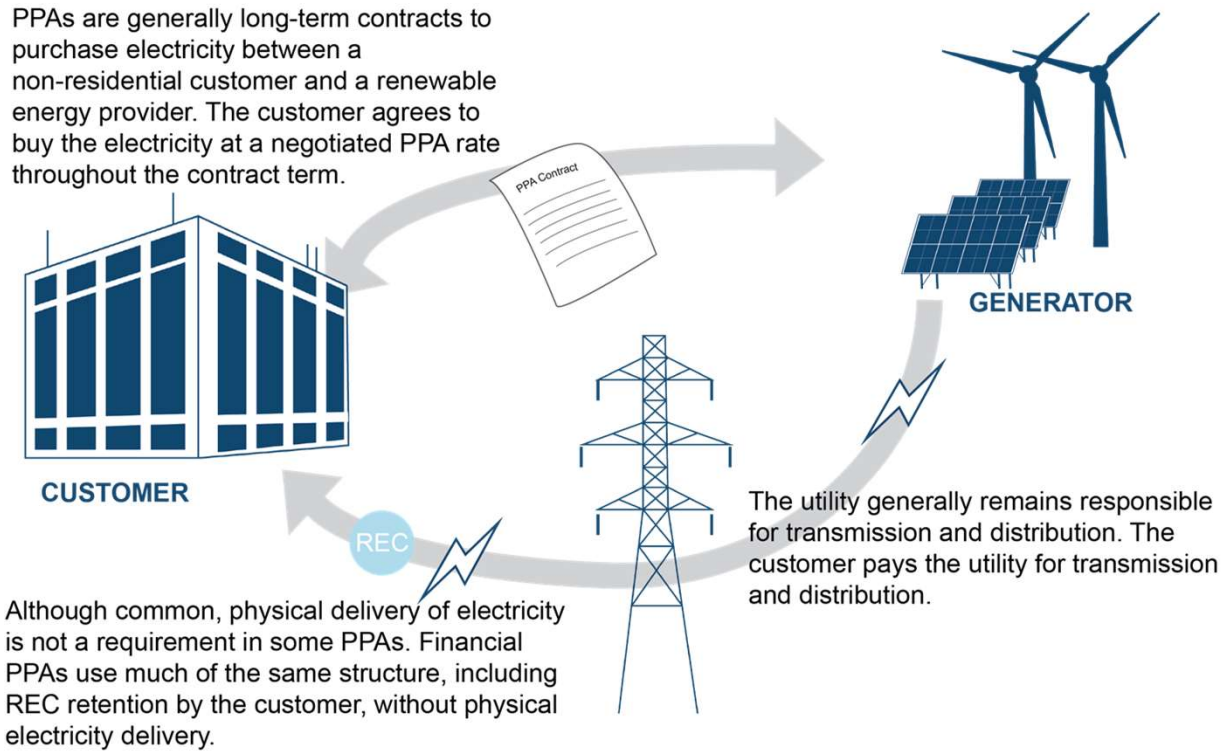
CCA customers "switch" from an incumbent investor-owned utility to a local government supplier with a green power product. The CCA purchases electricity and RECs from an alternative supplier. The investor-owned utility remains responsible for transmission and distribution.



Basic CCA structure

Specific program structures vary

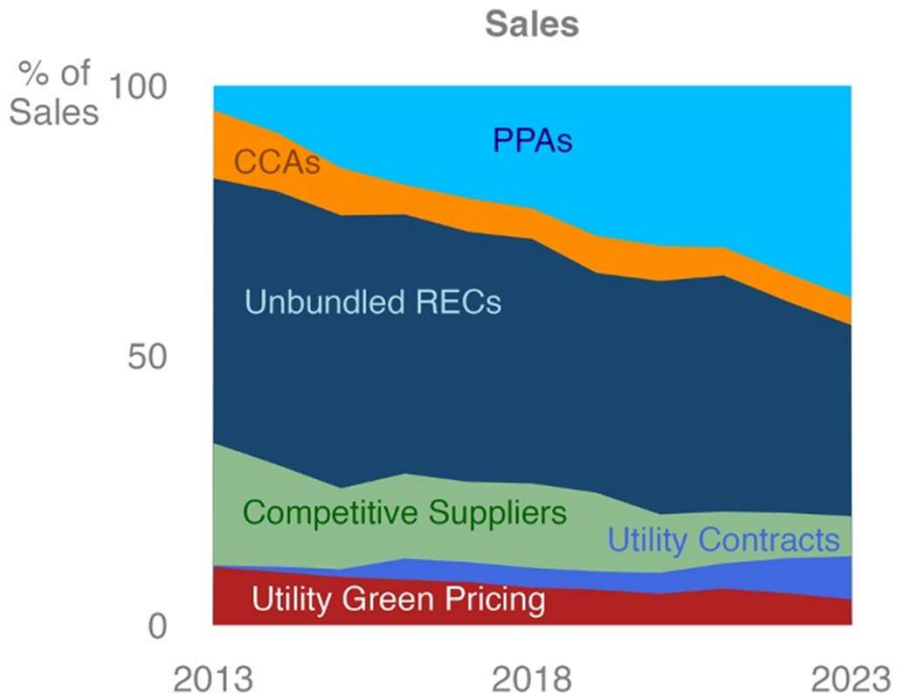
Power Purchase Agreements

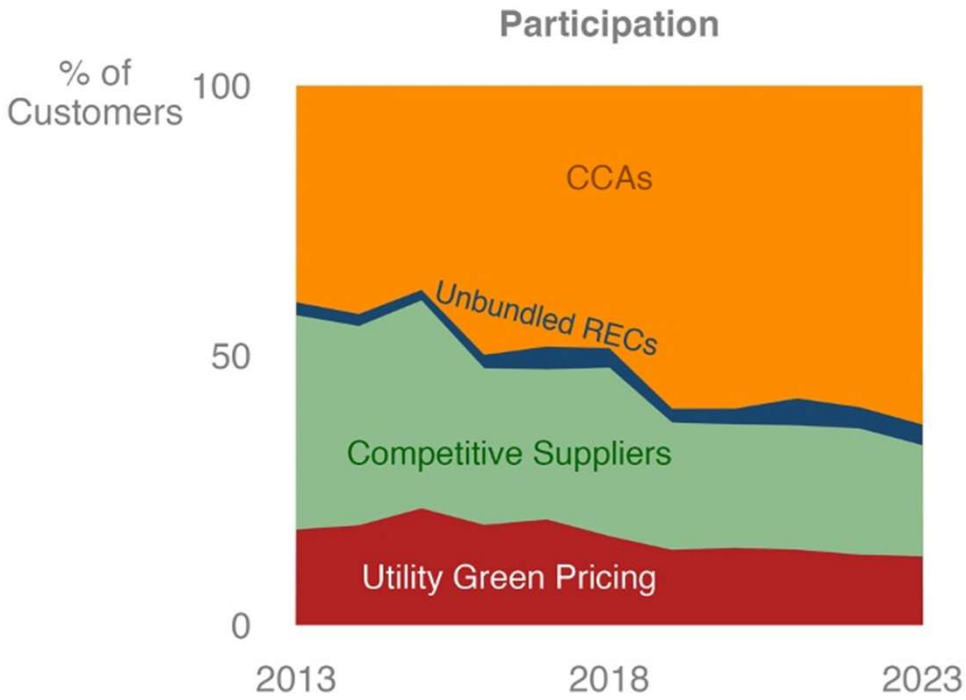


Basic PPA structure

Specific program structures vary

Green Power Sales and Customers by Mechanism





Additional NREL Resources

Find additional resources at the NREL Voluntary Green Power Procurement landing page:

www.nrel.gov/analysis/green-power.html

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Session Break

Please Break for 10-minutes and
return for the Claims Workshop

RENEWABLE ELECTRICITY MARKETS & CLAIMS 101 WORKSHOP

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EPA GREEN POWER PARTNERSHIP

VOLUNTARY RENEWABLE ENERGY MARKETS 101

Bailey Rosen
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EPA's Green Power Partnership
September 16, 2024

EPA's Green Power Partnership

- A **voluntary** program that encourages organizations to use green power

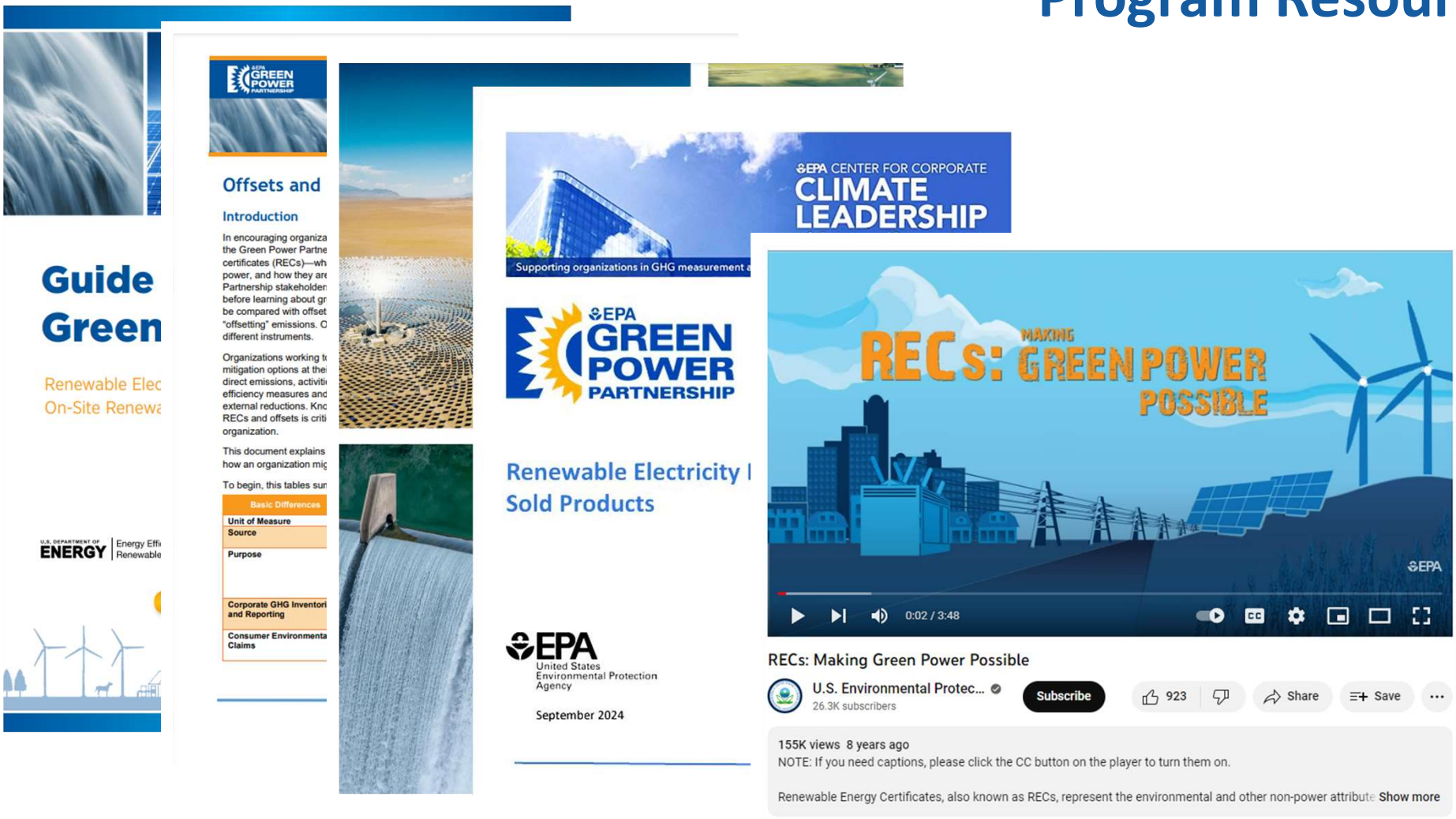
  We seek to:
  - Reduce U.S. GHG emissions
  - Expand the voluntary green power market
  - Standardize green power procurement as part of best practice environmental management

- We provide Partners with:
  - Technical assistance and tools on procuring green power
  - A recognition platform for organizations using green power

https://www.epa.gov/greenpower & https://www.epa.gov/green-power-markets

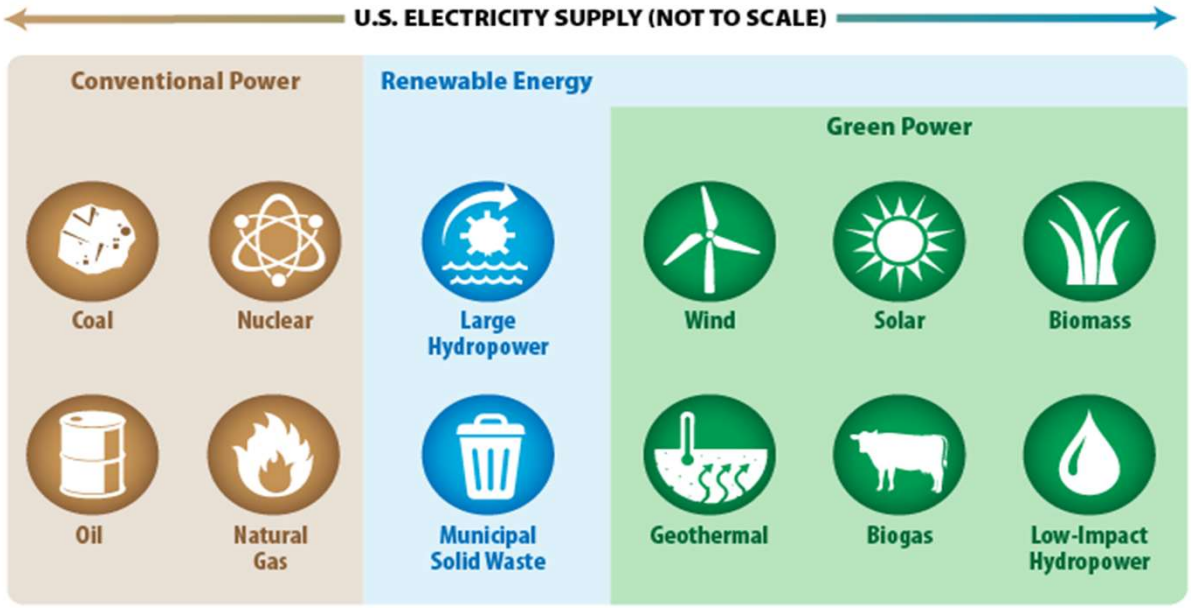
https://www.epa.gov/greenpower/meet-our-partners

Program Resources

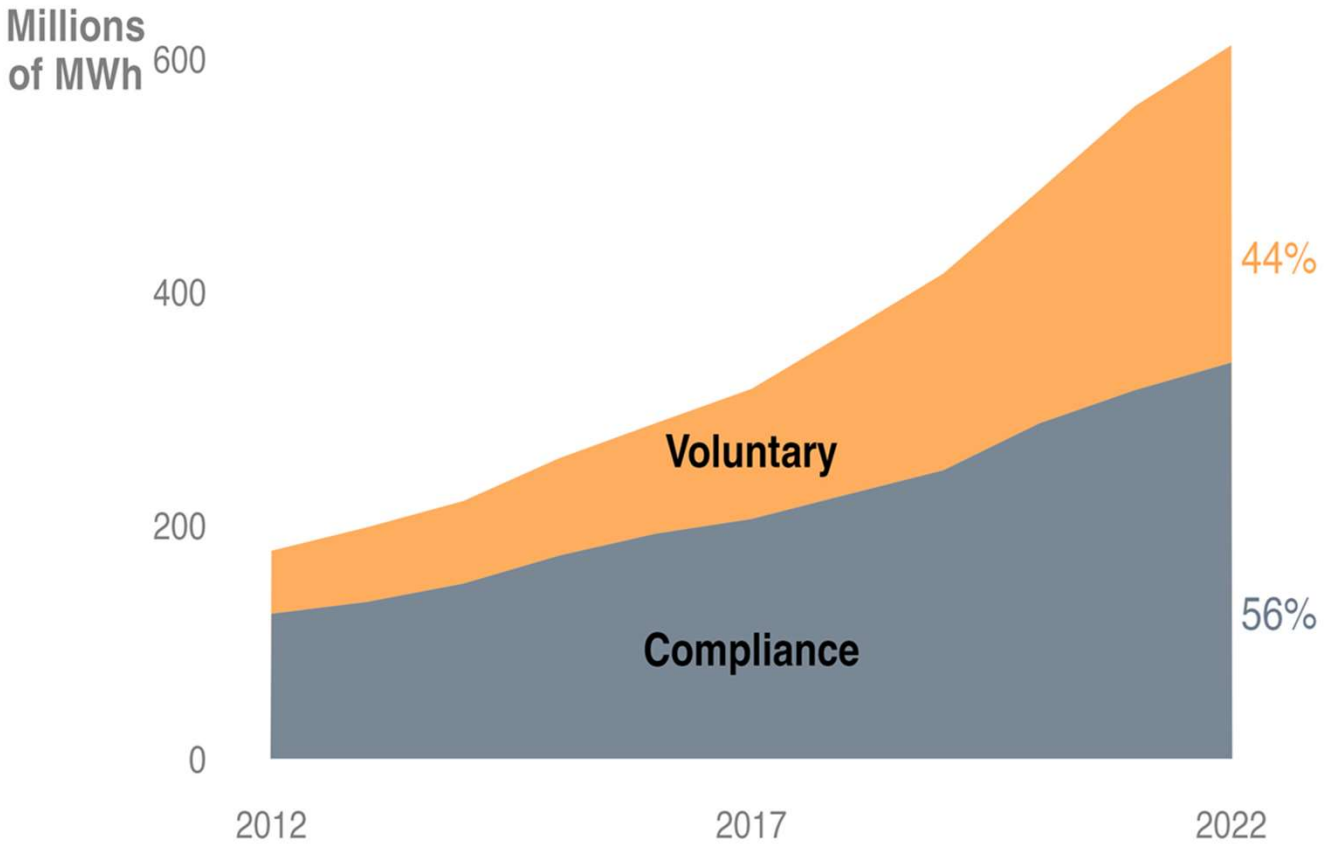


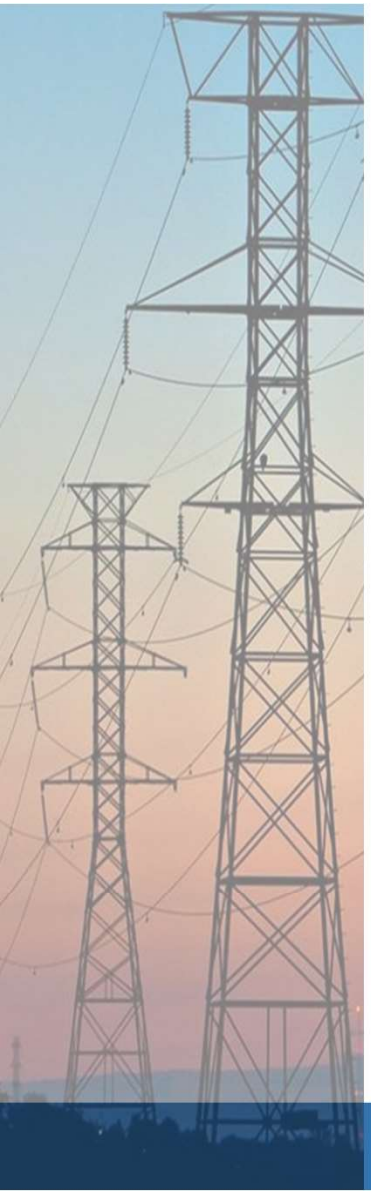
What is Green Power?

- **Green power** is a subset of renewable electricity that:
  - Meets national standards for product quality and content
  - Is specific to the "voluntary market"
    - Driven by consumer preference rather than policy mandate
  - Is incremental to what is required by mandate



The Voluntary Market





Green Power Supply Options

Retail Options

- Retail (Unbundled) RECs
- Utility Products or Programs
- Community Choice Aggregation

Project Specific

- Self-supply
- Physical PPAs
- Shared Renewables
- Utility Green Tariffs
- Financial Contracts (vPPAs)

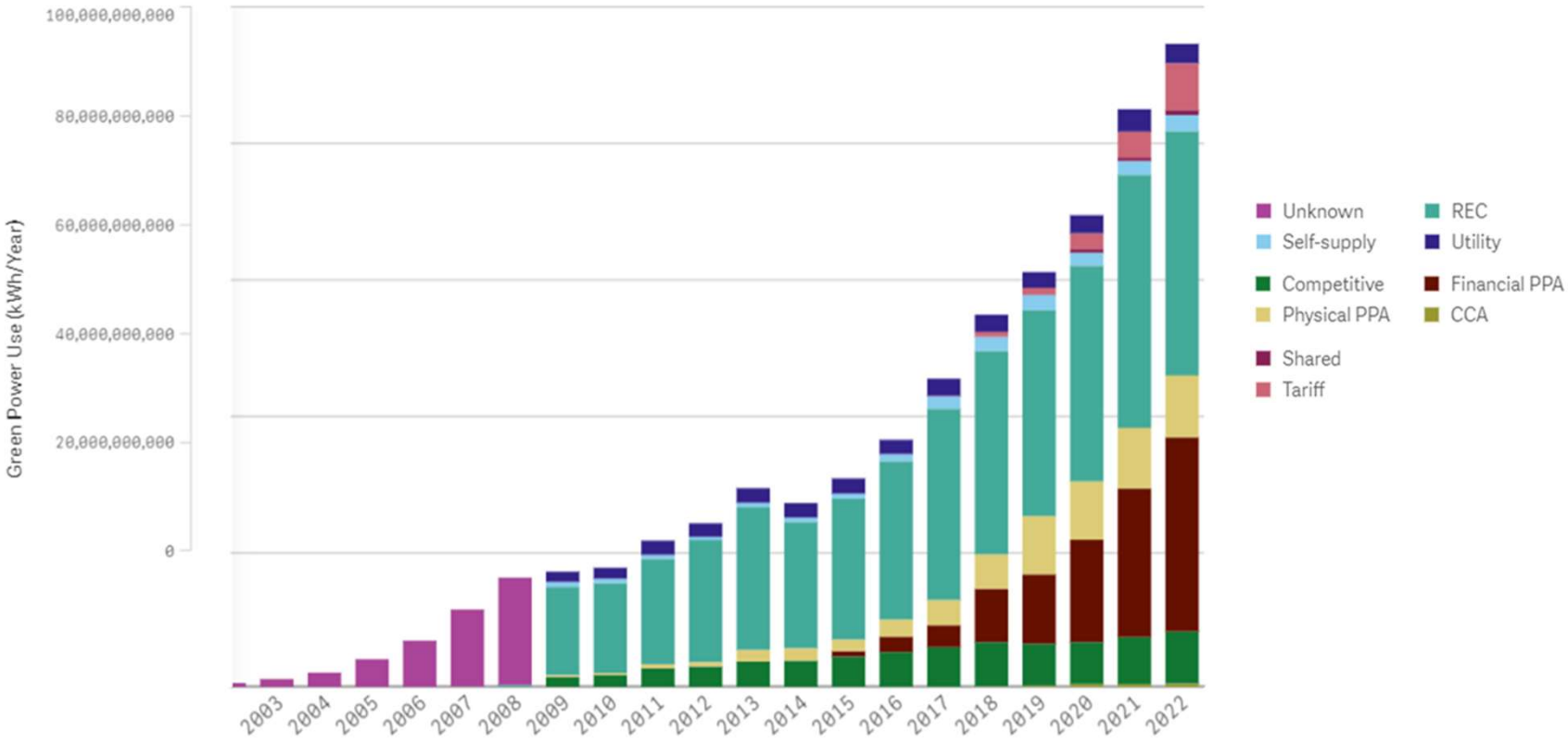
Green Power Supply Options

May Cost More

May Save You Money

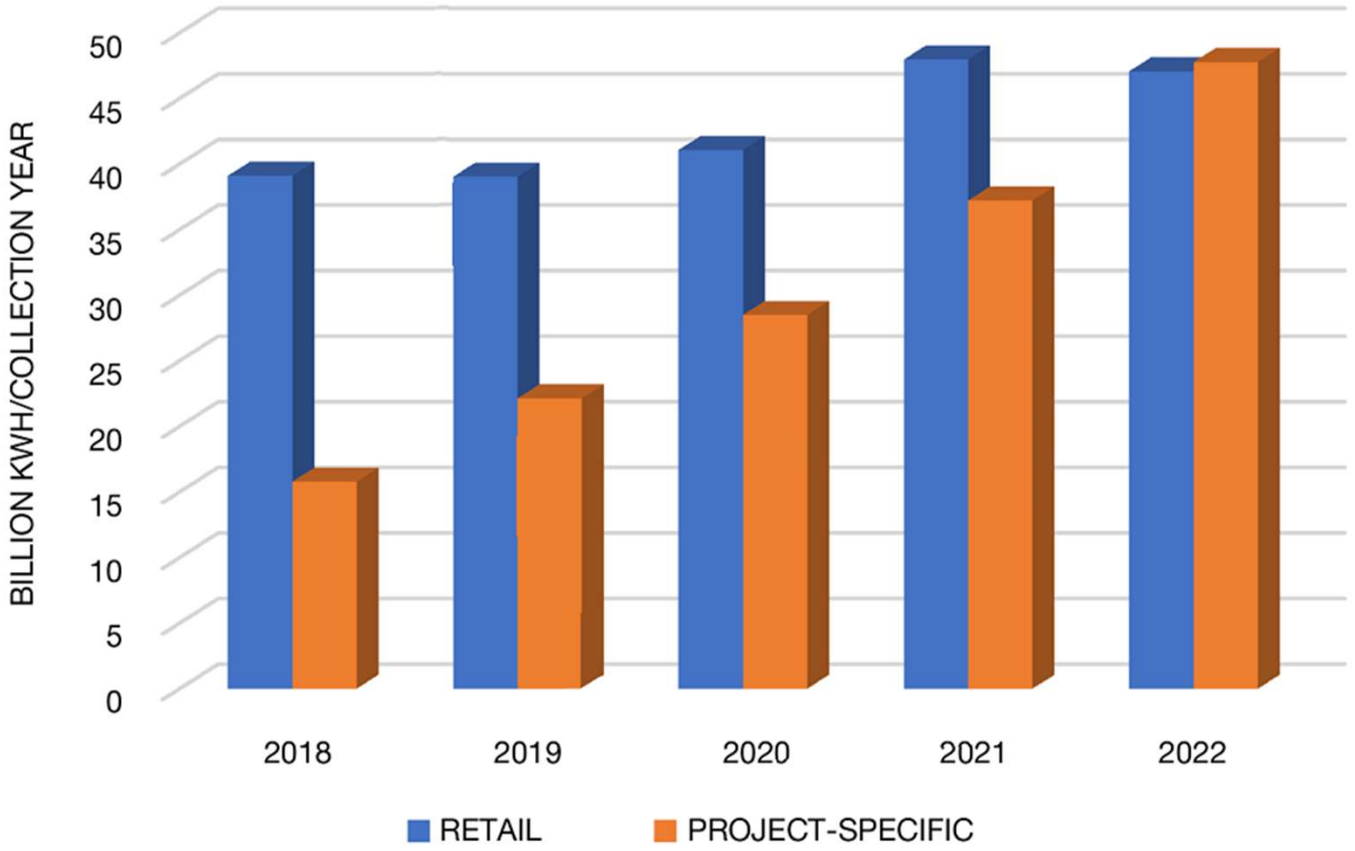
Retail Options		Retail Options	Project Specific
• Unbundled RECs • Utility Products or Programs	Current Electricity Costs	• Community Choice Aggregation	• Self-supply • Physical PPAs • Shared Renewables • Utility Green Tariffs • Financial/virtual PPAs

Partner Green Power Use by Supply Options



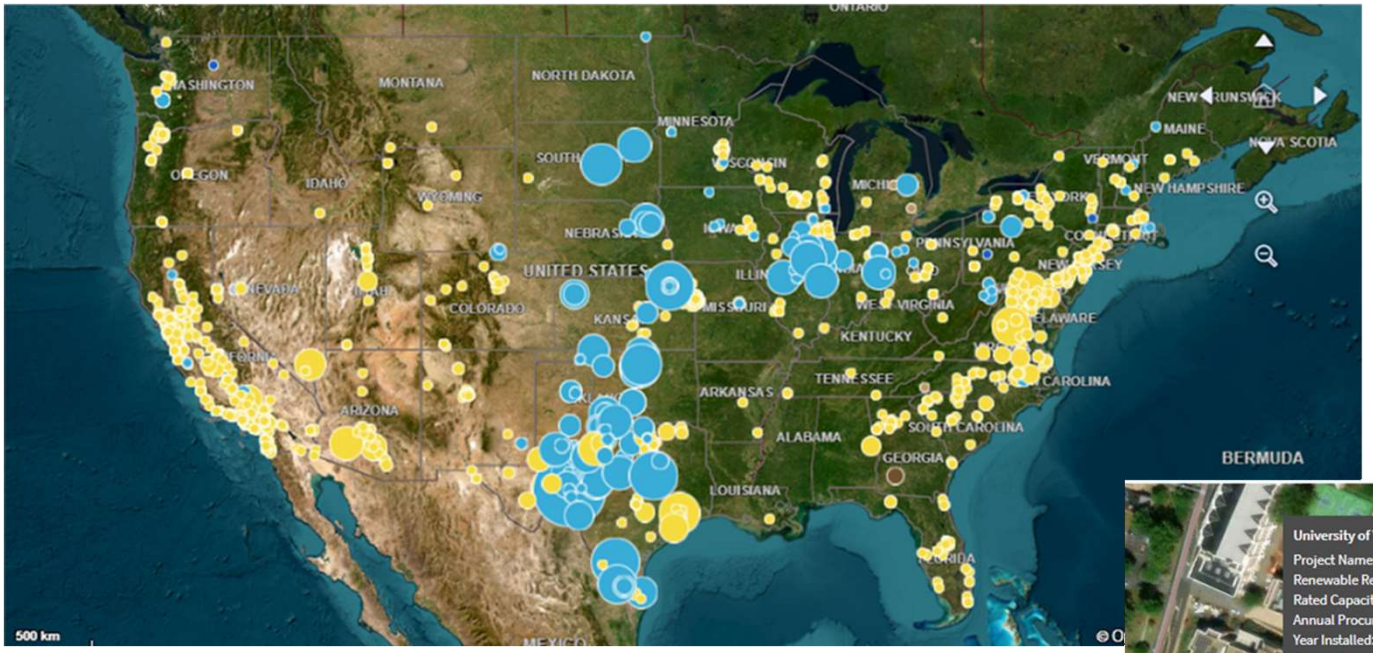
https://www.epa.gov/greenpower/program-data-viewer

Partner Green Power by Supply Type



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

GPP Project Map



https://www.epa.gov/greenpower/project-map

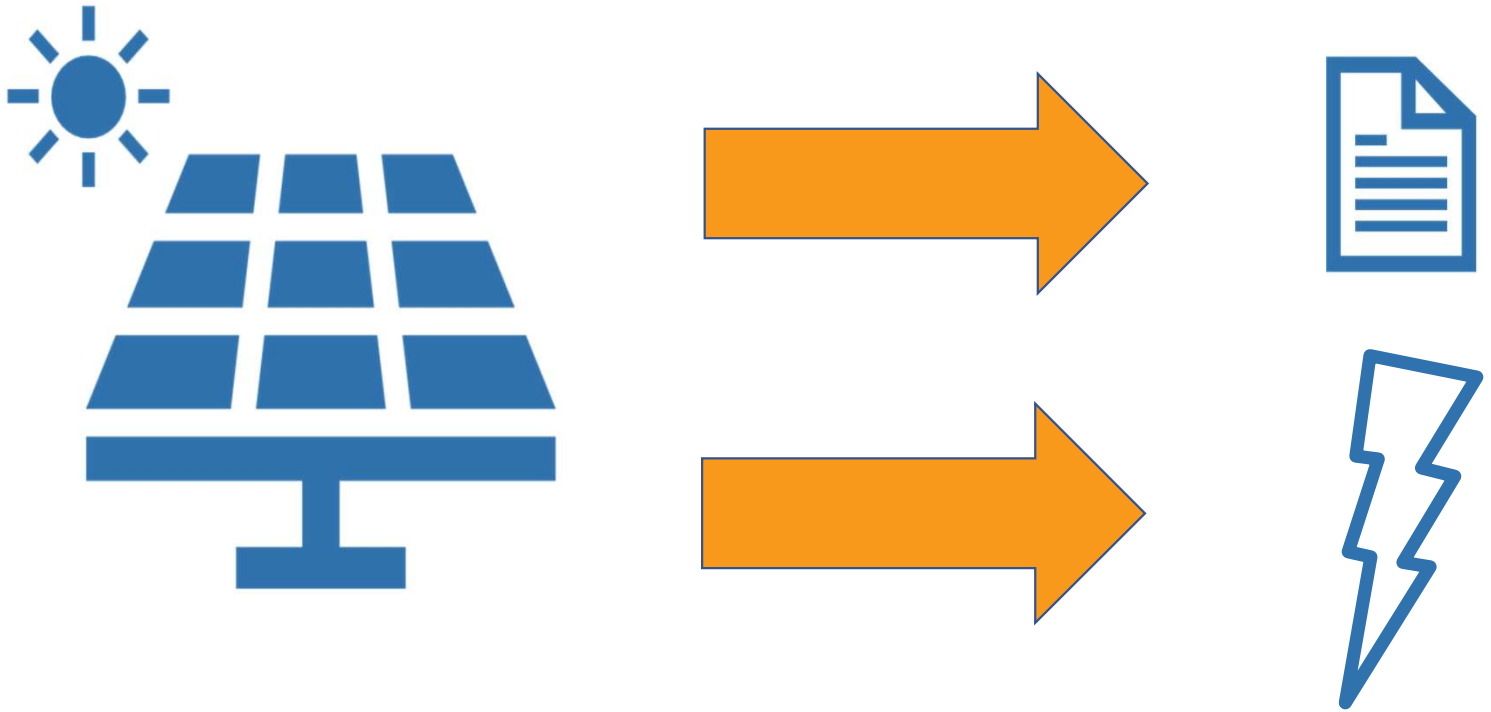
Emerging Market Trends

- Emphasis on impact
- Procurement granularity
- Data management and transparency
- Evolution of reporting
- International trade policies
- Updates to GHG accounting
- Scope 3/value chain engagement

EPA GREEN POWER PARTNERSHIP

CLAIMS 101

Renewable Energy Certificates (RECs)



Why Are RECs Important?

- Currency of renewable energy markets
  - Both compliance and voluntary
- Backed by metering and mutual trust
- Inherent in all green power procurements
- Different from offsets
  - Different instruments, applications, claims

Determining REC Ownership

- Contracts determine ownership
  - Power Purchase Agreements
  - Interconnection agreements
  - State and utility incentives
  - Other green power contracts

- Solar Energy Industries Association Solar Business Code
  - Guiding Principles
    - 5.14: Many Consumers are unfamiliar with RECs and their characteristics…. The Company must take steps to educate its Consumer about RECs, including providing …: Guidelines for Renewable Energy Claims: Guidance for Consumers and Electricity Providers, Center for Resource Solutions (Feb. 26, 2015)

Determining REC Ownership

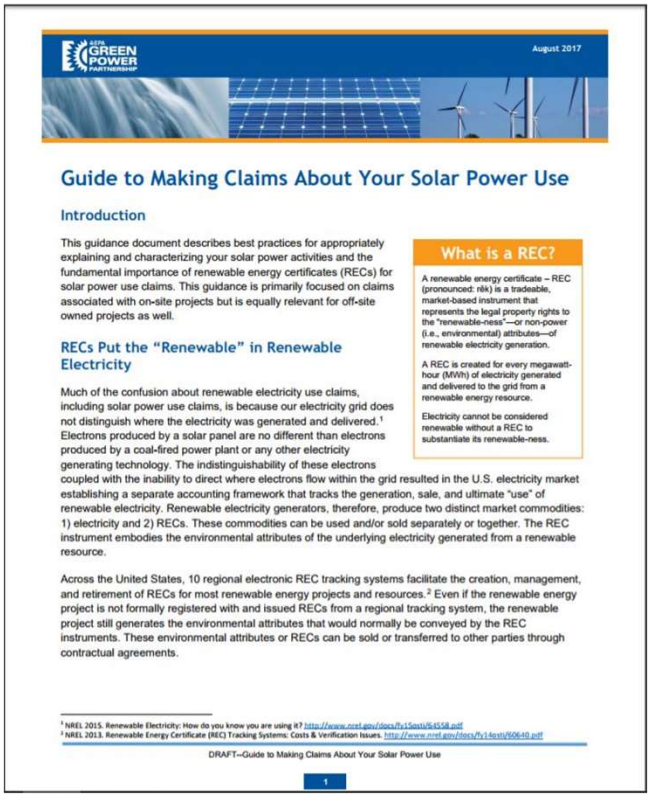
Environmental Attributes and Environmental Incentives.

Unless otherwise specified on **Exhibit 1**, Seller is the owner of all Environmental Attributes and Environmental Incentives and is entitled to the benefit of all Tax Credits, and Purchaser's purchase of electricity under this Agreement does not include Environmental Attributes, Environmental Incentives or the right to Tax Credits or any other attributes of ownership and operation of the System, all of which shall be retained by Seller. Purchaser shall cooperate with Seller in obtaining, securing and transferring all Environmental Attributes and Environmental Incentives and the benefit of all Tax Credits, including by using the electric energy generated by the System in a manner necessary to qualify for such available Environmental Attributes, Environmental Incentives and Tax Credits. Purchaser shall not be obligated to incur any out–of–pocket costs or expenses in connection with such actions unless reimbursed by Seller. If any Environmental Incentives are paid directly to Purchaser, Purchaser shall immediately pay such amounts over to Seller. To avoid any conflicts with fair trade rules regarding claims of solar or renewable energy use, Purchaser, if engaged in commerce and/or trade, shall submit to Seller for approval any press releases regarding Purchaser's use of solar or renewable energy and shall not submit for publication any such releases without the written approval of Seller. Approval shall not be unreasonably withheld, and Seller's review and approval shall be made in a timely manner to permit Purchaser's timely publication.

"**Environmental Attributes**" means any and all credits, benefits, emissions reductions, offsets, and allowances, howsoever entitled, attributable to the System, the production of electrical energy from the System and its displacement of conventional energy generation, including (a) any avoided emissions of pollutants to the air, soil or water such as sulfur oxides (SOx), nitrogen oxides (NOx), carbon monoxide (CO) and other pollutants; (b) any avoided emissions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride and other greenhouse gases (GHGs) that have been determined by the United Nations Intergovernmental Panel on Climate Change, or otherwise by law, to contribute to the actual or potential threat of altering the Earth's climate by trapping heat in the atmosphere; and (c) the reporting rights related to these avoided emissions, such as Green Tag Reporting Rights and Renewable Energy Credits. Green Tag Reporting Rights are the right of a party to report the ownership of accumulated Green Tags in compliance with federal or state law, if applicable, and to a federal or state agency or any other party, and include Green Tag Reporting Rights accruing under Section 1605(b) of The Energy Policy Act of 1992 and any present or future federal, state, or local law, regulation or bill, and international or foreign emissions trading program. Environmental Attributes do not include Environmental Incentives and Tax Credits. Purchaser and Seller shall file all tax returns in a manner consistent with this Section 5. Without limiting the generality of the foregoing, Environmental Attributes include carbon trading credits, renewable energy credits or certificates, emissions reduction credits, emissions allowances, green tags tradable renewable credits and Green-e® products.

Making Environmental Claims

- Big driver of green power procurement
- Messaging should be transparent and tangible
  - EPA's Equivalency Calculator
- Simple, safe claims
  - I use renewable electricity from a zero emissions resource
  - Precise amounts and equivalenies
- Don't Confuse "RECs" and "Offsets"



EPA GREEN POWER PARTNERSHIP

August 2017

Guide to Making Claims About Your Solar Power Use

Introduction

This guidance document describes best practices for appropriately explaining and characterizing your solar power activities and the fundamental importance of renewable energy certificates (RECs) for solar power use claims. This guidance is primarily focused on claims associated with on-site projects but is equally relevant for off-site owned projects as well.

What is a REC?

A renewable energy certificate – REC (pronounced: rĕk) is a 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.

A REC is created for every megawatt-hour (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.

RECs Put the "Renewable" in Renewable Electricity

Much of the confusion about renewable electricity use claims, including solar power use claims, is because our electricity grid does not distinguish where the electricity was generated and delivered.[1] Electrons produced by a solar panel are no different than electrons produced by a coal-fired power plant or any other electricity generating technology. The indistinguishability of these electrons coupled with the inability to direct where electrons flow within the grid resulted in the U.S. electricity market establishing a separate accounting framework that tracks the generation, sale, and ultimate "use" of renewable electricity. Renewable electricity generators, therefore, produce two distinct market commodities: 1) electricity and 2) RECs. These commodities can be used and/or sold separately or together. The REC instrument embodies the environmental attributes of the underlying electricity generated from a renewable resource.

Across the United States, 10 regional electronic REC tracking systems facilitate the creation, management, and retirement of RECs for most renewable energy projects and resources.[2] Even if the renewable energy project is not formally registered with and issued RECs from a regional tracking system, the renewable project still generates the environmental attributes that would normally be conveyed by the REC instruments. These environmental attributes or RECs can be sold or transferred to other parties through contractual agreements.

[1] NREL 2015. Renewable Electricity: How do you know you are using it? http://www.nrel.gov/docs/fy15osti/64558.pdf
[2] NREL 2013. Renewable Energy Certificate (REC) Tracking Systems: Costs & Verification Issues. http://www.nrel.gov/docs/fy14osti/60640.pdf

DRAFT—Guide to Making Claims About Your Solar Power Use

1

www.epa.gov/sites/default/files/2017-09/documents/gpp-guidelines-for-making-solar-claims.pdf

Direct or Express Claims

- FTC Example: A toy manufacturer places solar panels on the roof of its plant to generate power and advertises that its plant is “100% solar-powered.” The manufacturer, however, sells renewable energy certificates based on the renewable attributes of all the power it generates. Even if the manufacturer uses the electricity generated by the solar panels, it has, by selling renewable energy certificates, transferred the right to characterize that electricity as renewable.

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- **The manufacturer's claim is deceptive.**

Implied Claims

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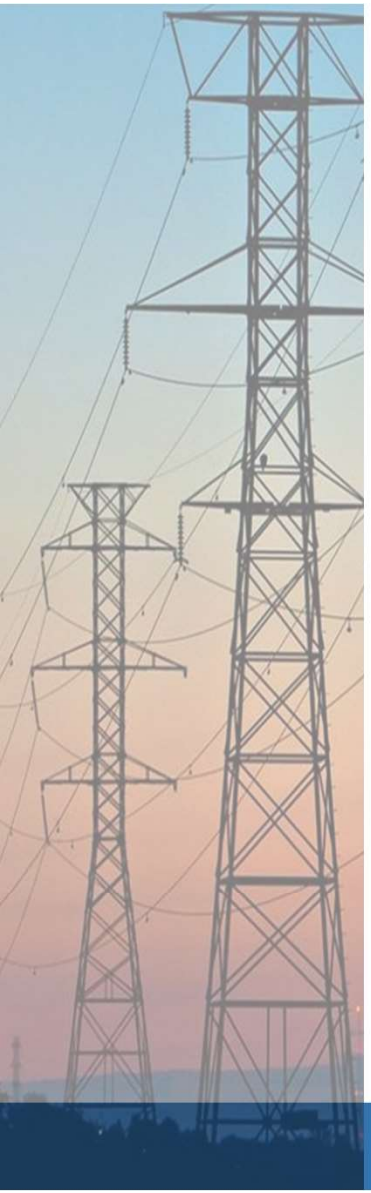
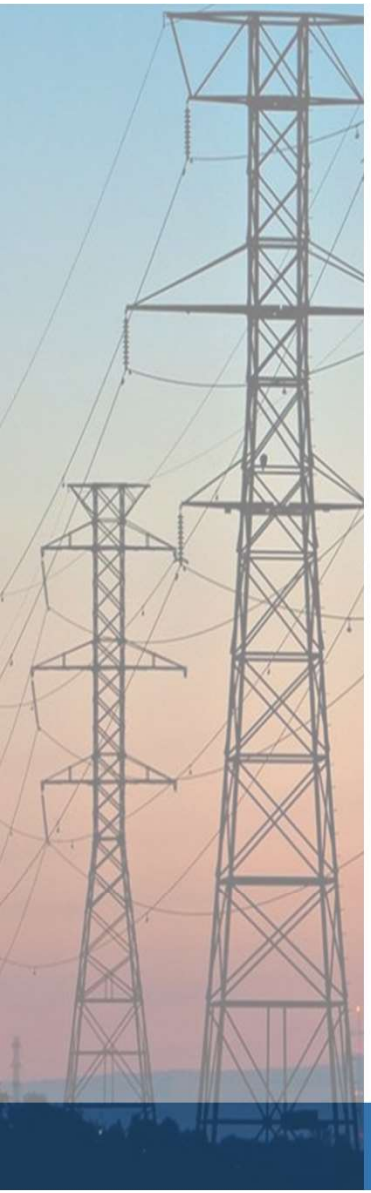
- **It also would be deceptive for this manufacturer to advertise that it “hosts” a renewable power facility because reasonable consumers likely interpret this claim to mean that the manufacturer uses renewable energy.**



Implied Claims, continued

- A university issues a press release about its recent power purchase agreement for a on-campus, 1 MW solar array

- Press release highlights:
  - University's goal of achieving carbon neutrality by 2030
  - University's new purchase of fixed price electricity from the on-campus solar facility.



Implied Claims, continued

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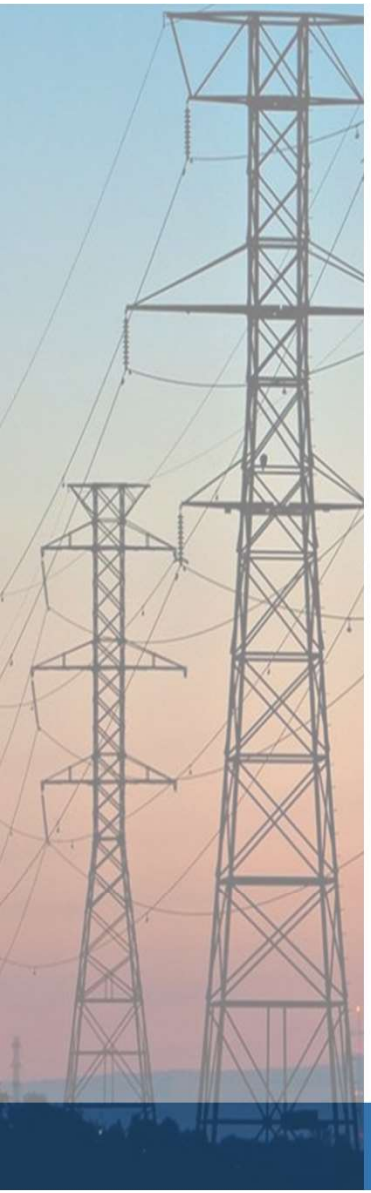
- Press release highlights:
  - University's goal of achieving carbon neutrality by 2030
  - University's new purchase of fixed price electricity from the on-campus solar facility.
- **Both claims are technically accurate.**
- **However, reasonable consumer would interpret as the university is using solar to reduce its carbon footprint.**

Potential Consequences of Deceptive Claims

- **Legal:** Federal Trade Commission and state attorney general offices
- **Contractual & Financial**: Breach of contract
- **Brand & Reputation**: Issuance of clarifying statement
- **Renewable Energy Market**: Double "use" claim on the same renewable electricity
- **GHG Accounting:** Double accounting for same zero emission resource



Market Standards & Guidance

- **U.S. FTC's Green Guides for the Use of Environmental Marketing Claims**
- **U.S. EPA**
  - Green Power Partnership minimum purchase requirements
- **World Resources Institutes's GHG accounting standards**
- **Third-party certification/verification**
  - Certification is a best practice
  - Standards set expectations for both the compliance and voluntary REC markets

EPA GREEN POWER PARTNERSHIP

CLAIMS WORKSHOP

Interactive Claims Workshop

Instructions:

1. Break up into small groups
2. Introduce yourselves to your group
3. Select a spokesperson
4. Select all appropriate answers for your scenario
5. Prepare to report back on which are the correct claims and why

Scenario 1

Scenario 1: Company A has onsite solar system and owns associated RECs. What claims can this company make about their use and generation of renewable electricity and associated greenhouse gas emissions? Select all that apply.

- We are using solar power
- Our solar panels are reducing our carbon footprint
- Our solar panels are helping to reduce our energy costs and generate revenue through the sale of the RECs
- Apply the zero-emissions rate conveyed by the REC to our purchased electricity consumption under Scope 2
- Apply grid average emissions rate or grid residual mix

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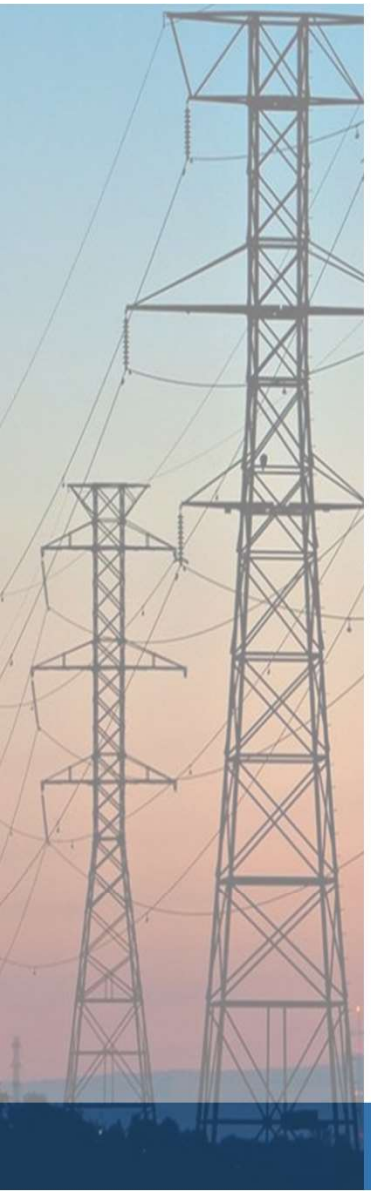
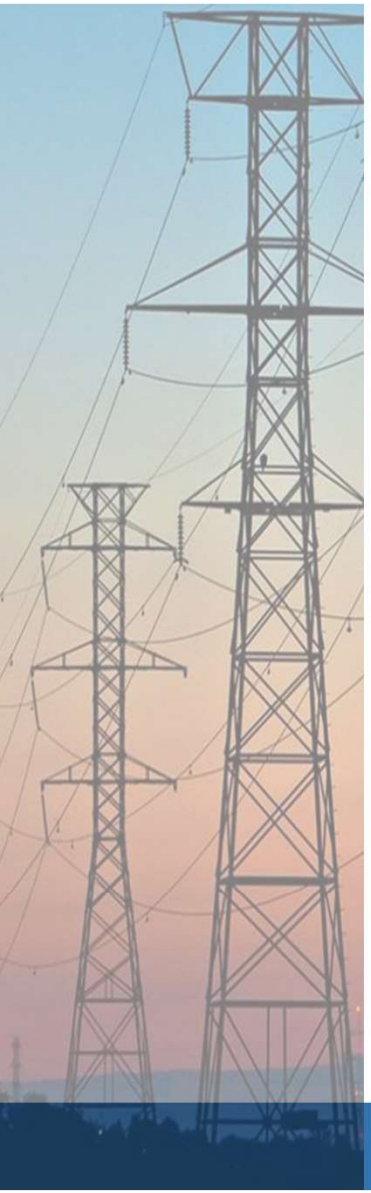


Scenario 2

Scenario 2: Company B has onsite solar system but does not own associated RECs. What claims can this company claim about their use and generation of renewable energy and associated greenhouse gas emissions? Select all that apply.

- We are using solar power
- We are not using solar power, but our solar system is helping to green the grid
- Our solar panels are helping to reduce our energy costs and generate revenue through the sale of the RECs
- Apply the zero-emissions rate conveyed by the REC to your purchased electricity consumption
- Apply grid average emissions rate or grid residual mix



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- We are using solar power
- **We are not using solar power, but our solar system is helping to green the grid**
- **Our solar panels are helping to reduce our energy costs and generate revenue through the sale of the RECs**
- Apply the zero-emissions rate conveyed by the REC to your purchased electricity consumption
- **Apply grid average emissions rate or grid residual mix**

Scenario 3

Scenario 3: Company C has onsite solar and does not own associated Solar RECs, but purchases wind RECs equal to 100% of power needs. What claims can this company claim about their use and generation of renewable energy and associated greenhouse gas emissions? Select all that apply.

- We are not using solar power, but our solar system is helping to green the grid
- Our solar panels are reducing our carbon footprint
- Our solar panels are helping to reduce our energy costs and generate revenue through the sale of the RECs
- Apply grid average emissions rate or grid residual mix
- Apply zero-emissions rate from the replacement wind RECs but not claim it to be of solar origin

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- **We are not using solar power, but our solar system is helping to green the grid**
- Our solar panels are reducing our carbon footprint
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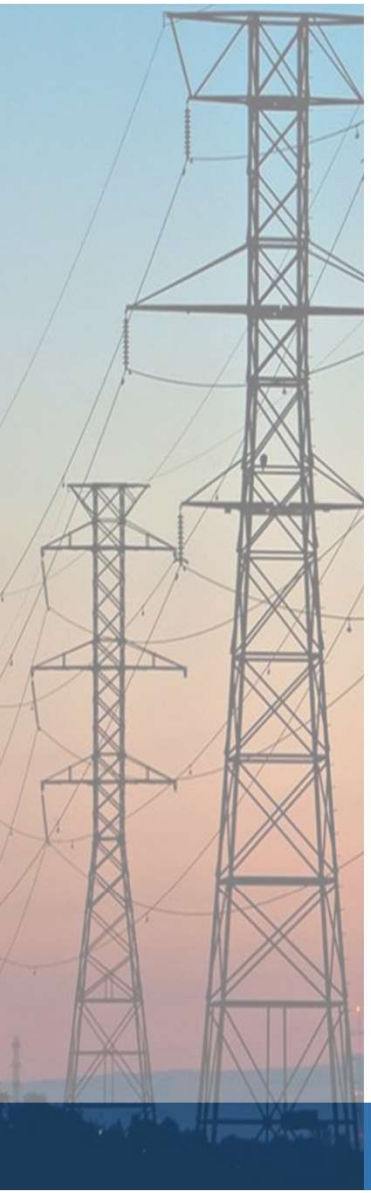
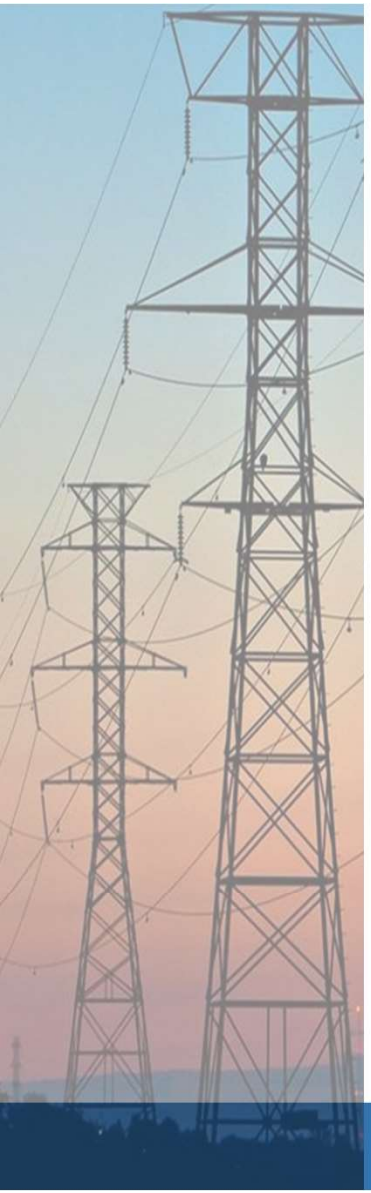


Scenario 4

Scenario 4: University D signs a physical PPA to offtake production from 10 MW of wind power (and associated RECs) with a yet-to-be developed off-site 100 MW system. Nine other institutions have similar 10 MW PPA agreements and because of this PPA, the project is now being built. What claims can this company claim about their use and generation of renewable energy and associated greenhouse gas emissions? Select all that apply.

- We are using wind power
- We helped develop new renewable energy supply
- We are not using wind power, but our wind turbine system is helping to green the grid
- Apply the zero-emissions rate conveyed by the REC to your purchased electricity consumption
- Apply grid average emissions rate or grid residual mix



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- **We are using wind power**
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- We are not using wind power, but our wind turbine system is helping to green the grid
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- Apply grid average emissions rate or grid residual mix

Scenario 5

Scenario 5: Company E signs a 20-year physical PPA with a new off-site solar system, but per agreement the developer owns RECs for the first 5 years and company will purchase replacement nationally sourced wind RECs. For years 5-20 the company will own RECs. What claims can this company claim about their use and generation of renewable energy and associated greenhouse gas emissions for years 1-5 AND years 5-20? Select all that apply.

- We are using solar power/powered by solar energy
- We are not using solar power, but our solar system is helping to green the grid
- Our solar panels reduce our carbon footprint
- Apply zero emissions rate from the replacement wind RECs but not claim it to be of solar origin
- Apply the zero-emissions rate conveyed by the solar RECs to your purchased electricity consumption

Scenario 5 – Years 1-5

Scenario 5: Company E signs a 20-year physical PPA with a new off-site solar system, but per agreement the developer owns RECs for the first 5 years and company will purchase replacement nationally sourced wind RECs. For years 5-20 the company will own RECs. What claims can this company claim about their use and generation of renewable energy and associated greenhouse gas emissions for years 1-5 AND years 5-20? Select all that apply.

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Scenario 5 – Years 5-20

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  - **Apply the zero emissions rate conveyed by the solar RECs to your purchased electricity consumption**

Claims: Additional Resources

- Visit Green Power Partnerships' Green Power Market Claims web page:
  - https://www.epa.gov/green-power-markets/environmental-claims
- Center for Resource Solutions (CRS) REC claims and ownership
  - http://resource-solutions.org/learn/rec-claims-and-ownership
- National Association of Attorneys General (NAAG) *Environmental Marketing Guidelines for Electricity*
  - http://apps3.eere.energy.gov/greenpower/buying/pdfs/naag_0100.pdf
- Vermont Attorney General's Office *Guidance for Third-Party Solar Projects*
  - https://ago.vermont.gov/wp-content/uploads/2018/01/Guidance-on-Solar-Marketing.pdf
- RE100 *Making credible renewable energy usage claims*
  - https://www.there100.org/sites/re100/files/2020-09/RE100%20Making%20Credible%20Claims.pdf

Review Quiz

Question #1

What is a REC?

1. Something, like a vehicle or a building, that is badly damaged
2. A solid collection of mineral grains that have cemented together
3. A 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.

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Question #2

What is a good definition of the voluntary green power market? Select all that apply.

- The voluntary or “green power” market is that in which consumers and organizations voluntarily purchase renewable energy to match all or part of their electricity needs.
- Voluntary power requires obligated electric service providers to have a minimum amount of renewable energy in their electricity supply.
- The compliance market, as a natural floor to the market, represents what is the basic minimum percentage of renewable electricity provided to users. The voluntary market represents an unlimited opportunity above the market floor that is only constrained by voluntary demand and capped by total demand for electricity.

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Question #3

What is an RPS?

- Speed at which records are played
- Renewable portfolio standard - a requirement that a specific percentage of electricity the utility sells comes from renewable resources
- A genre of video games

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- Purchasing Green-e certified products
- That they are purchased via cryptocurrency
- That they are the prettiest REC in the market

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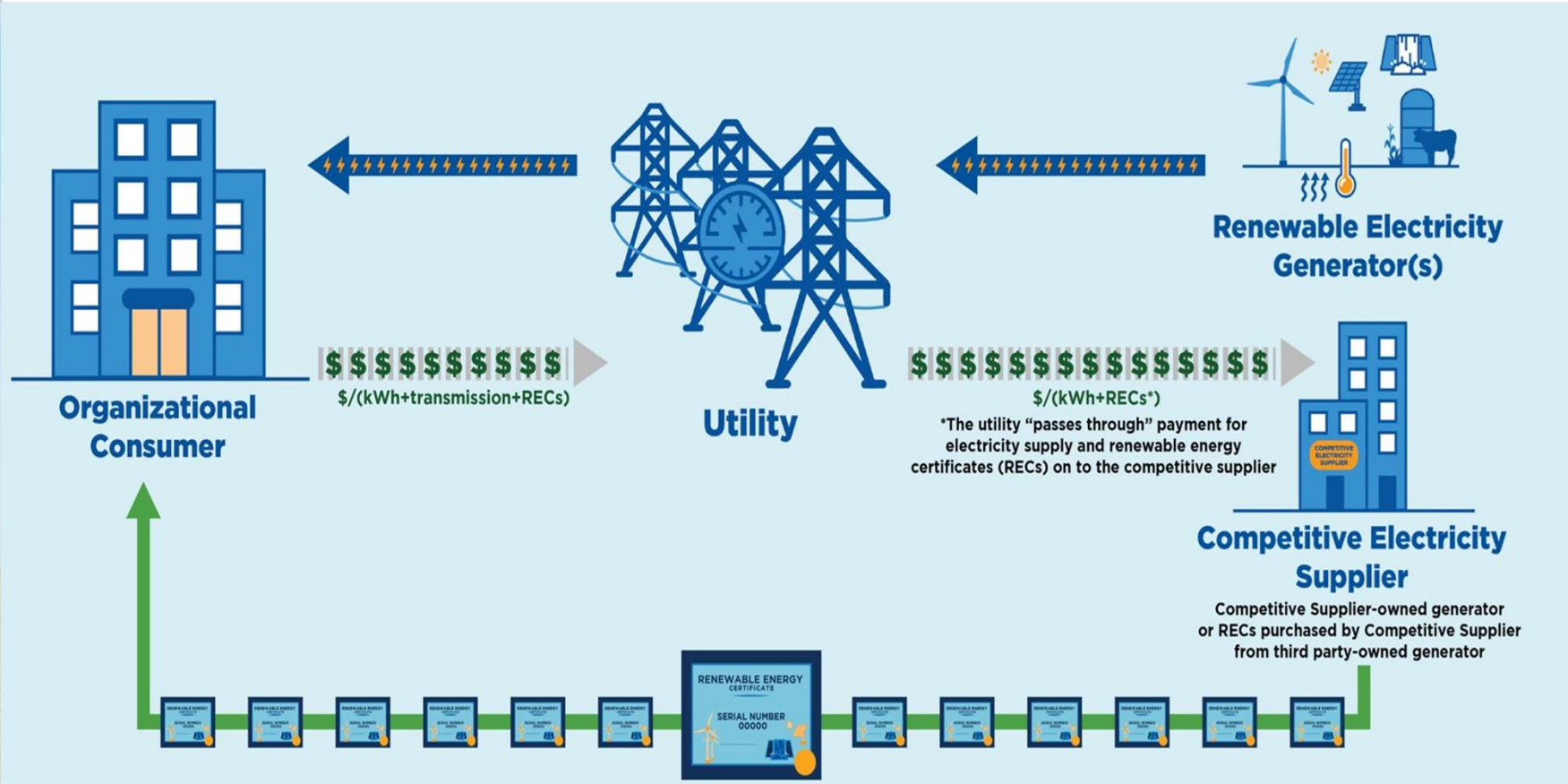
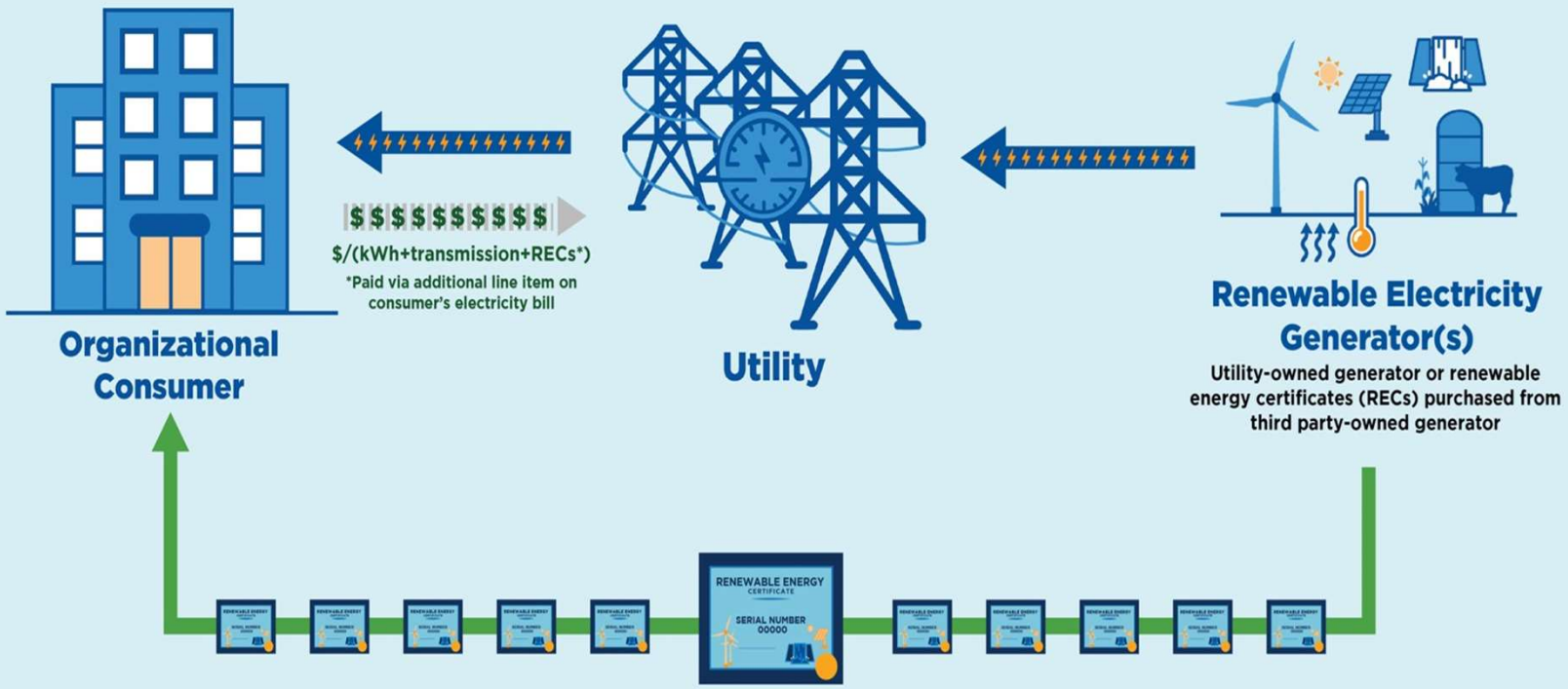

Renewable Electricity Generator(s)
Organizational Consumer
$/(kWh+transmission+RECs)
Utility
$/(kWh+RECs*)
*The utility "passes through" payment for electricity supply and renewable energy certificates (RECs) on to the competitive supplier
Competitive Electricity Supplier
Competitive Supplier-owned generator or RECs purchased by Competitive Supplier from third party-owned generator
RENEWABLE ENERGY CERTIFICATE
SERIAL NUMBER 00000

Question #6


Organizational Consumer
$$$$$$$$$$
$/(kWh+transmission+RECs*)
*Paid via additional line item on consumer's electricity bill
Utility
Renewable Electricity Generator(s)
Utility-owned generator or renewable energy certificates (RECs) purchased from third party-owned generator
RENEWABLE ENERGY CERTIFICATE
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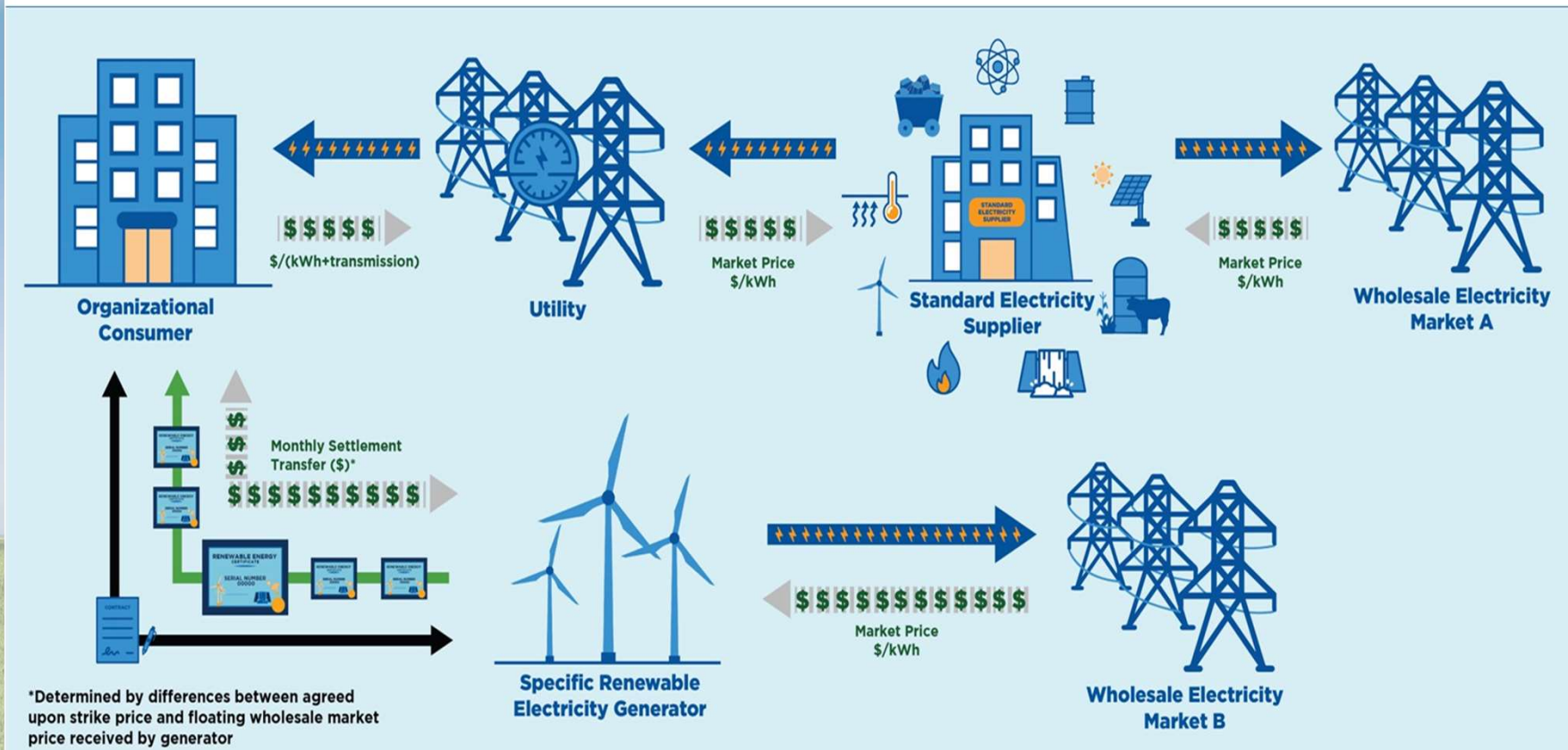
Extra Credit



Q and A

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