Status and Trends in the Voluntary Market (2020 data)

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State of the Voluntary Green Power Market
Green Power Partnership Webinar
February 23, 2022
In 2020, about **7.5 million customers** procured about **192 million MWh** of renewable energy through green power markets.

That represents about:

- **1 in 20** U.S. retail electricity customers
- **5%** of U.S. retail electricity sales

Total green power sales 2010-2020 (million MWh)
Voluntary Market Trends by Market Segment
Utility Green Pricing

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
About **1,085,000 customers** procured about **11.6 million MWh** of voluntary green power through utility green pricing programs in 2020. The relatively slow growth in 2020 may reflect program marketing challenges related to the Covid-19 pandemic.
Impacts of Covid-19 Pandemic on Utility Green Pricing Programs

In a survey:

• Most respondents reported slight reductions in sales and participation from expected levels
• Respondents reported a reduced ability to actively market their programs, particularly through in-person marketing
• Some respondents noted that other extreme events such as wildfires have caused similar disruptions to program marketing in recent years
• At the same time, some respondents reported increased interest from proactive customers, perhaps because more time at home led to more interest in residential green power.
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
About **7.7 million MWh** of renewable energy was procured through **42 utility renewable contracts** through utility green pricing programs in 2020.
The Utility Contract Pipeline

Data compiled by NREL and supplemented by BNEF (2021).
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
About **1.5 million customers** procured about **21.6 million MWh** of voluntary green power through competitive suppliers in 2020. The year-over-year fall in sales likely reflects two trends: 1) a drop in electricity sales overall in 2020 due to the Covid-19 pandemic; and 2) ongoing increases in RPS requirements that reduced the green power portion of competitive supplier sales.
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
Unbundled RECs

About **221,000 customers** procured about **86.4 million MWh** of voluntary green power through unbundled RECs in 2020.
A CCA effectively “aggregates” the electricity demand of many customers (residential and non-residential) in order to procure electricity from an alternative supplier. The CCA “switches” from an incumbent electricity supplier to an alternative supplier with a renewable energy product (though the switch may include a non-renewable product). The CCA purchases electricity and RECs from the alternative supplier; the utility remains responsible for transmission and distribution.
CCA Trends

About **4.7 million customers** procured about **13 million MWh** of voluntary green power through CCAs in 2020.

Sales (million MWh)  
Customers (x1,000)
## CCA Sales by State

<table>
<thead>
<tr>
<th>State</th>
<th>Green Power Sales (MWh)</th>
<th>Green Power Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>9,632,000</td>
<td>3,888,000</td>
</tr>
<tr>
<td>Illinois</td>
<td>336,000</td>
<td>45,000</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>1,580,000</td>
<td>507,000</td>
</tr>
<tr>
<td>Ohio</td>
<td>693,000</td>
<td>111,000</td>
</tr>
<tr>
<td>New York</td>
<td>745,000</td>
<td>133,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>12,986,000</strong></td>
<td><strong>4,684,000</strong></td>
</tr>
</tbody>
</table>
Since Westchester County formed the first NY CCA in 2014, three other aggregators have emerged throughout the state.

Many NY communities have chosen to provide 100% renewable energy by default (opt out), and all aggregators offer opt-in green power products.

NY CCAs are also innovating. Several CCAs offer their own community solar programs, and one aggregator (Joule Assets) offers a unique opt-out community solar product to eligible CCA customers.

Power Purchase Agreements

PPAs are generally long-term contracts to purchase electricity between a non-residential customer and a renewable energy provider. The customer agrees to buy the electricity at a negotiated PPA rate throughout the contract term.

Although common, physical delivery of electricity is not a requirement in some PPAs. Financial PPAs use much of the same structure, including REC retention by the customer, without physical electricity delivery.

The utility generally remains responsible for transmission and distribution. The customer pays the utility for transmission and distribution.

Basic PPA structure

Specific program structures vary. See full report for a more complete description of the differences between physical and financial PPAs.
About **414 offtakers** procured about **51.8 million MWh** of voluntary green power through PPAs in 2020. These figures include only PPA sales where we estimate that the purchaser has retained the RECs.
Summary Trends
<table>
<thead>
<tr>
<th>Segment</th>
<th>Sales (million MWh)</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility green pricing</td>
<td>11.6</td>
<td>1,085,000</td>
</tr>
<tr>
<td>Utility renewable contracts</td>
<td>7.7</td>
<td>42</td>
</tr>
<tr>
<td>Competitive suppliers</td>
<td>21.6</td>
<td>1,537,000</td>
</tr>
<tr>
<td>Unbundled RECs</td>
<td>86.4</td>
<td>221,000</td>
</tr>
<tr>
<td>Community choice aggregation</td>
<td>13.0</td>
<td>4,684,000</td>
</tr>
<tr>
<td>Power purchase agreements</td>
<td>51.8</td>
<td>414</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>192.1</strong></td>
<td><strong>7,527,000</strong></td>
</tr>
</tbody>
</table>
Voluntary Sales Continue to Increase

- **Utility Green Pricing**
  - Sales (million MWh)
  - 2010: 6, 2015: 12, 2020: 18

- **Utility Contracts**
  - 2010: 2, 2015: 4, 2020: 8

- **Competitive Suppliers**
  - 2010: 0, 2015: 13, 2020: 26

- **Unbundled RECs**
  - 2010: 0, 2015: 43, 2020: 86

- **CCAs**
  - 2010: 0, 2015: 7, 2020: 14

- **PPAs**
  - 2010: 0, 2015: 26, 2020: 52
Participation Leveled Off in 2020
Green Power Sales and Customers by Mechanism

![Graph showing sales and participation by mechanism from 2010 to 2020. The graph includes categories such as PPAs, CCAs, Unbundled RECs, Competitive Suppliers, and Utility Green Pricing.]
NREL’s Voluntary Market Research

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https://www.nrel.gov/analysis/green-power.html
Thank you!

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