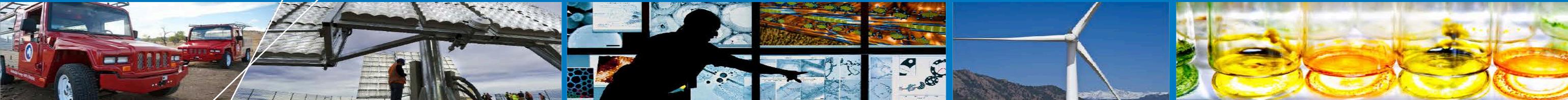


# Pop Quiz: Ten Trends in the Voluntary Green Power Market



**Renewable Energy Markets  
Conference**

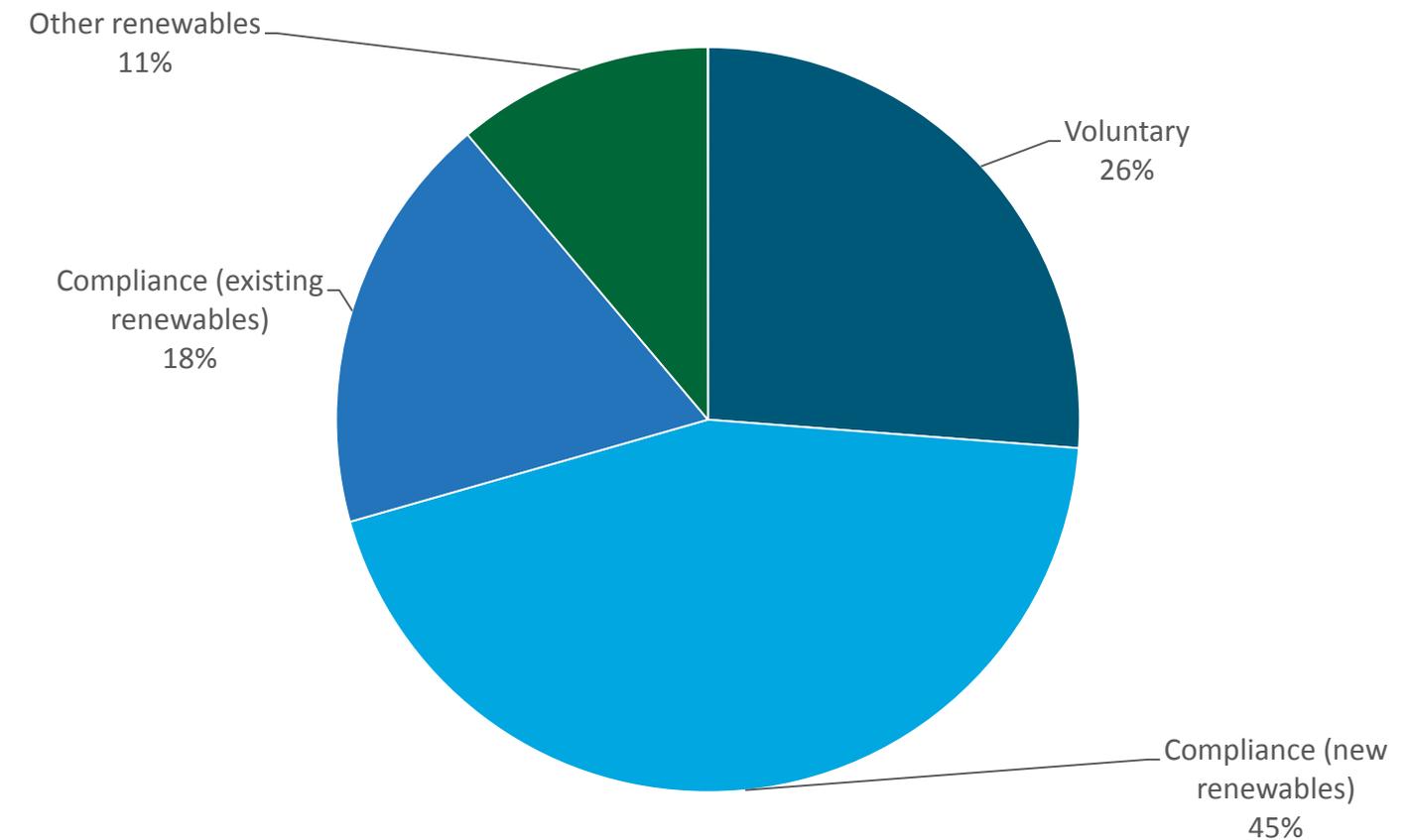
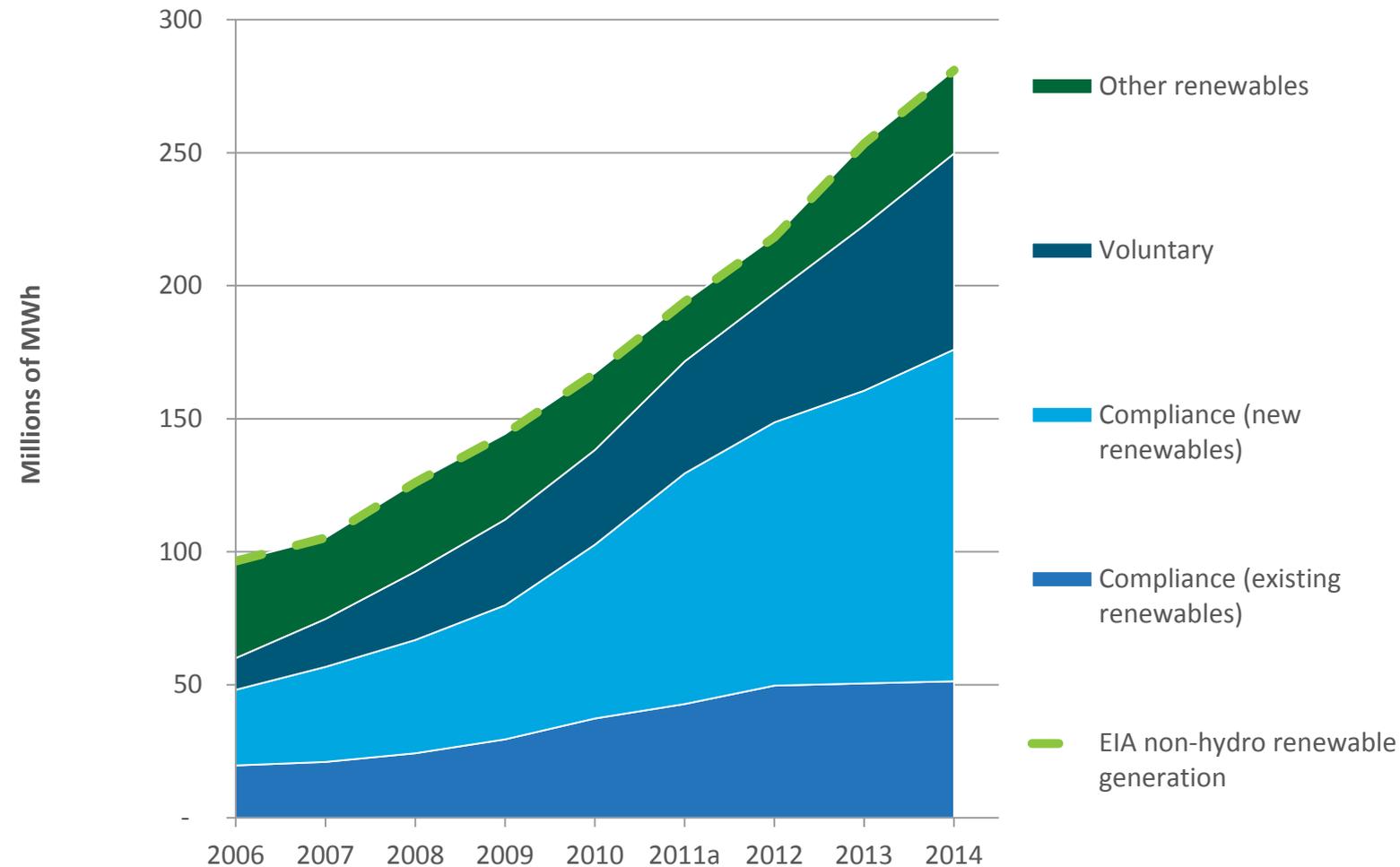
**Jenny Heeter**

**October 20, 2015**

# Q1: How large is the voluntary market compared to the total renewable market in the U.S.?

- 2%
- 10%
- 25%
- 50%

# A1: Voluntary market represented ~25% of total non-hydro renewable generation in 2014.

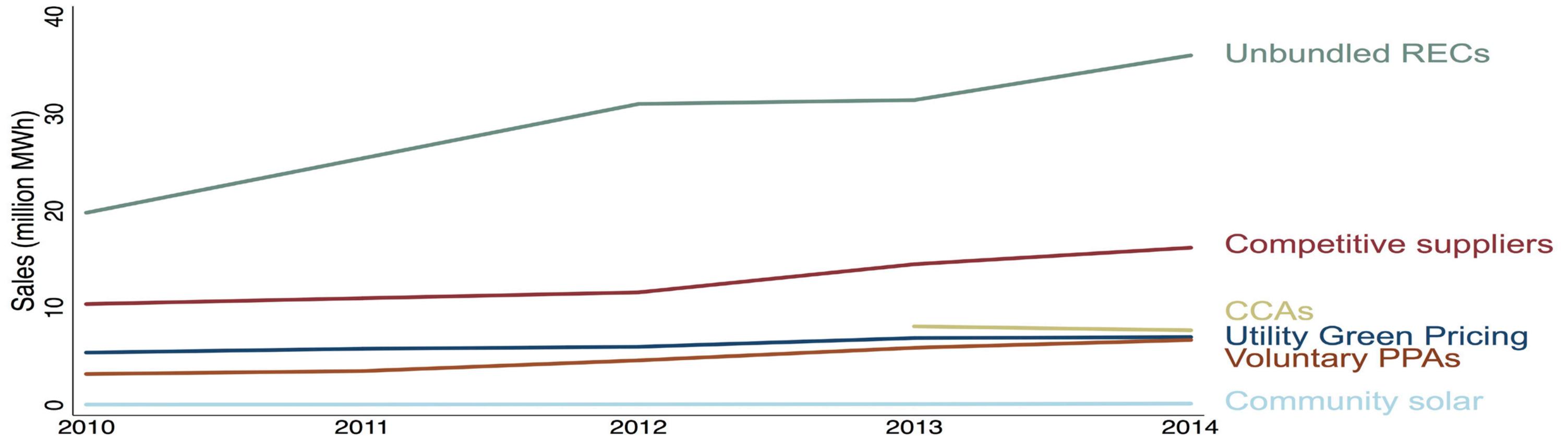


<sup>a</sup> 2011 voluntary market is an average of 2010 and 2012 data.

## Q2: How fast did voluntary market sales grow from 2013 to 2014?

- 2%
- 10%
- 25%
- 50%

## A2: Voluntary market sales grew by 10% from 2013 to 2014, totaling 74 Million MWh.



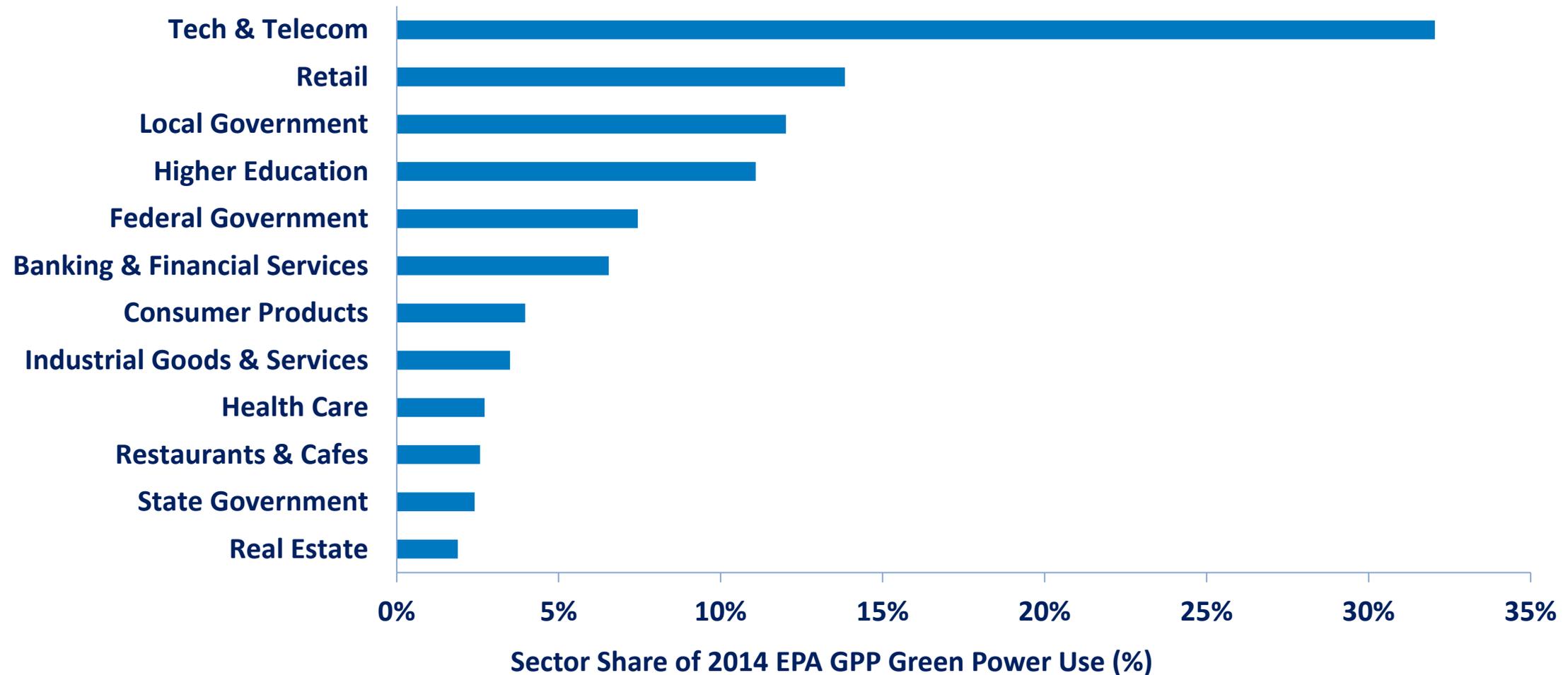
*The overall voluntary market continues to exhibit growth; sales of unbundled RECs increased by 15% in 2014 after being fairly flat from 2012-2013.*

*The 2014 report includes new data from Voluntary PPAs; we report on Community Choice Aggregation (CCA) programs for the second year.*

# **Q3: Which purchasing sector represents the largest share of purchasing by Partners in the EPA's Green Power Partnership?**

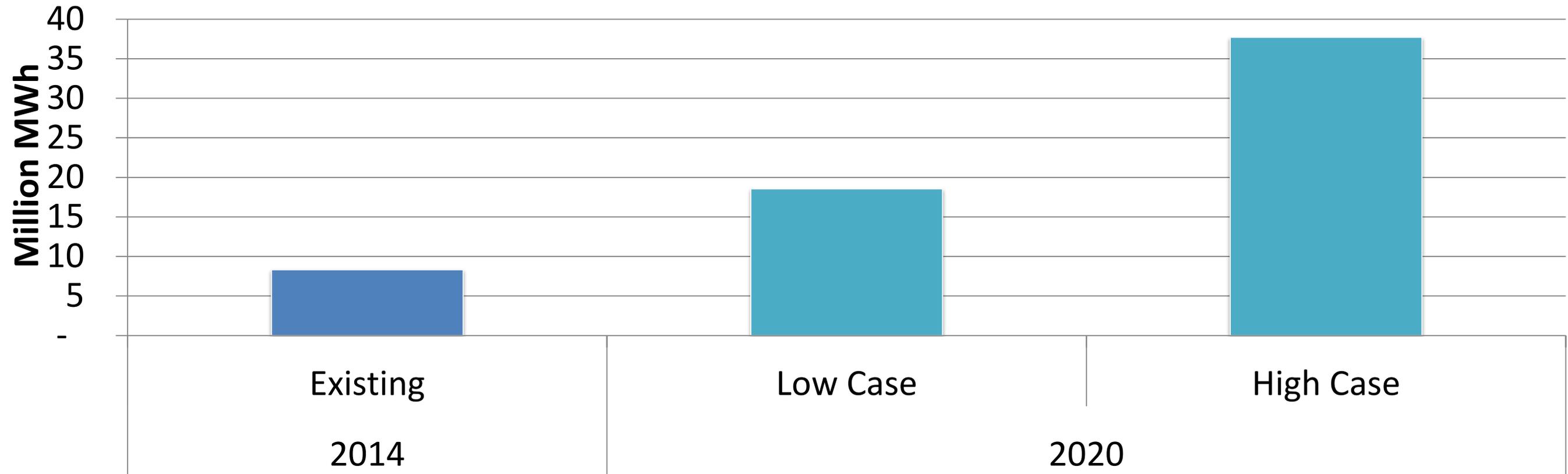
- Retailers
- State and Local Governments
- Tech & Telecom
- Higher Education

# A3: The Tech & Telecom sector represented the largest share of purchasing under EPA's Green Power Partnership in 2014.



*8.3 million MWh of renewable electricity use in 2014 (14% renewable), based on aggregated data for 113 ICT companies using EPA Green Power Partnership and CDP data.*

# ICT Renewable Use Projected Scenarios



*By 2020, our group of 113 companies could procure 18.5 million MWh to more than 37 million MWh of RE, representing 31% and 48% renewable electricity use, respectively. Estimates take into account current % RE by company, and company RE targets.*

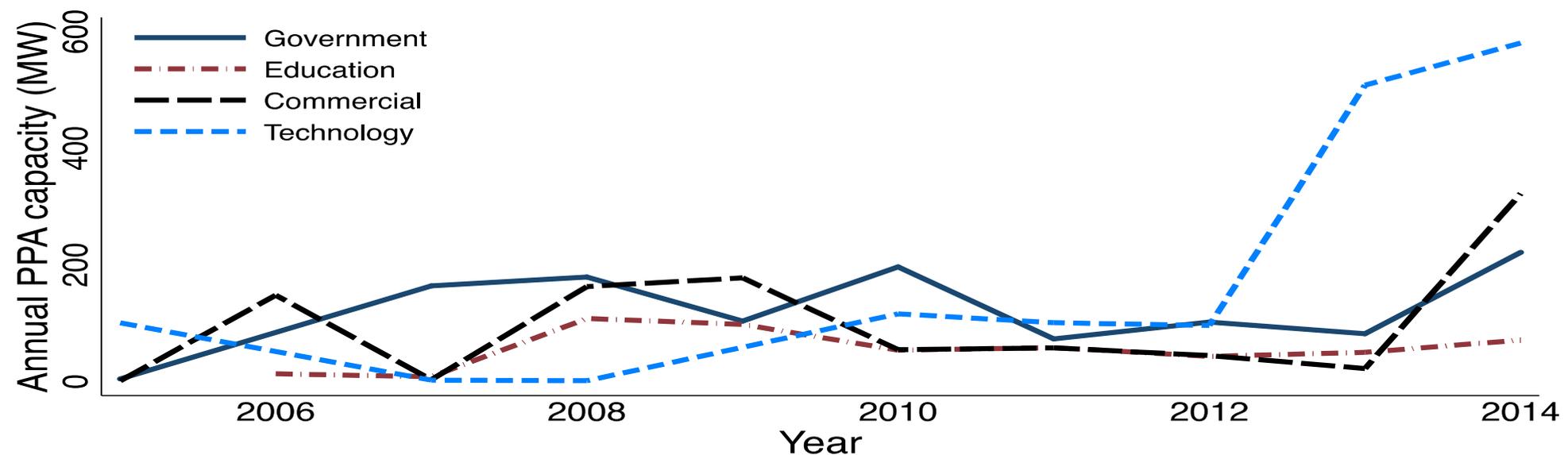
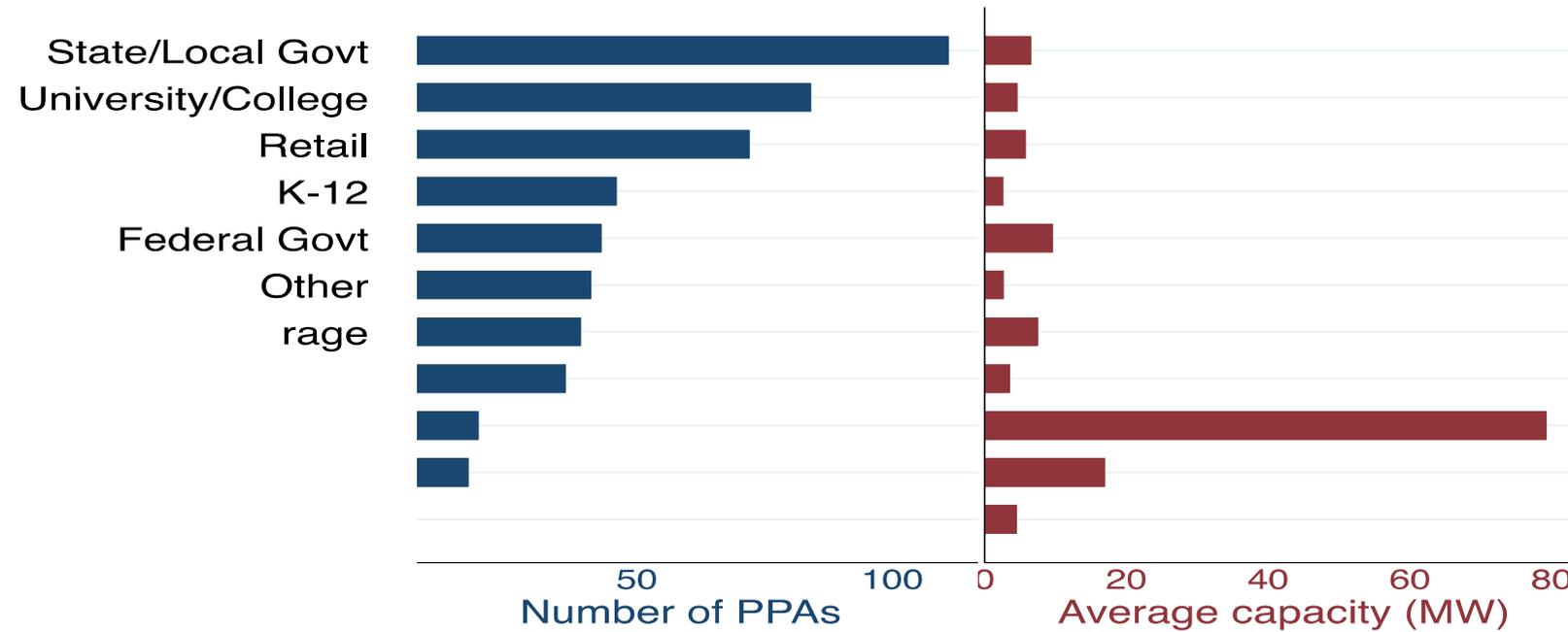
*Our estimates are limited by the amount of data available on ICT industry electricity consumption.*

*Full report: Miller, J., Bird, Lori, Heeter, Jenny, & Gorham, Bethany. (2015). Renewable Electricity Use by the U.S. Information and Communication Technology (ICT) Industry. <http://www.nrel.gov/docs/fy15osti/64011.pdf>*

## Q4: Which purchasing sector has signed the greatest number of PPAs?

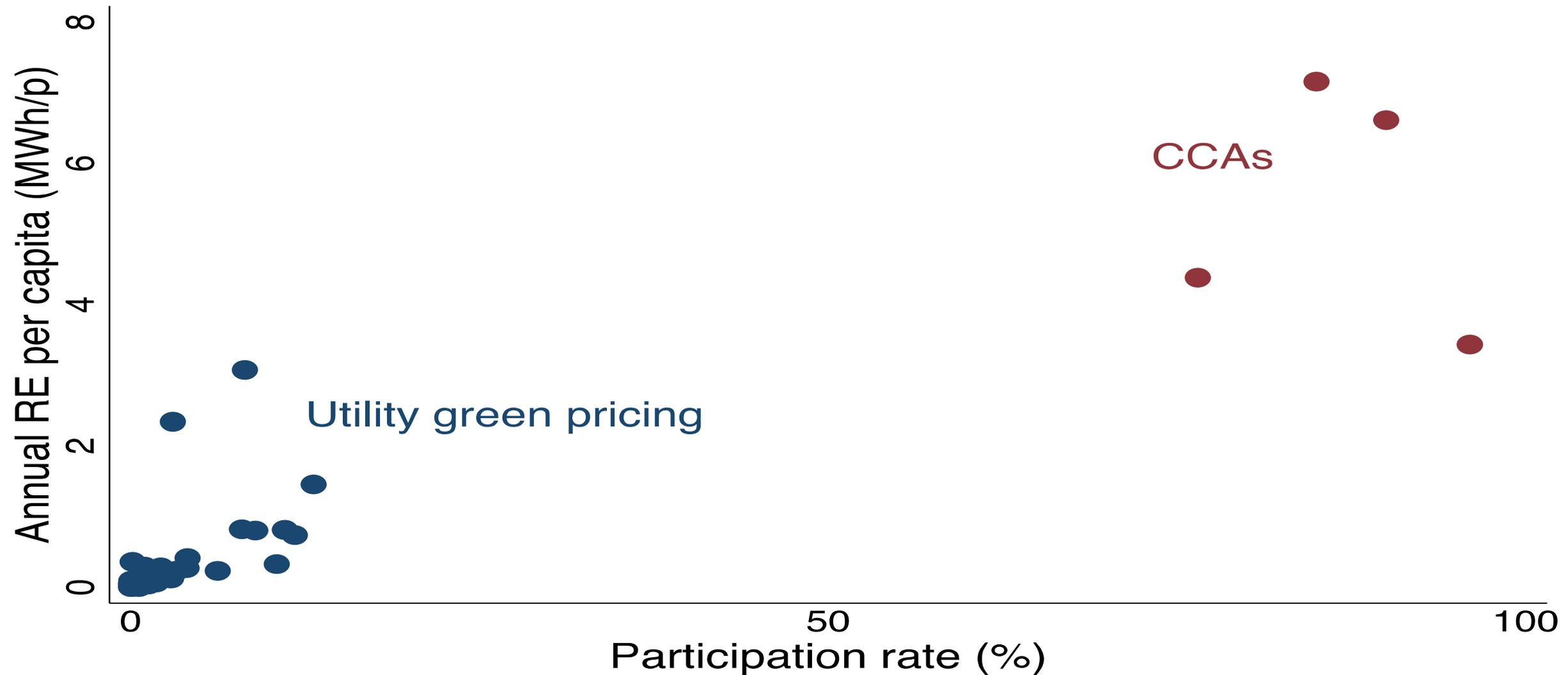
- Retailers
- State and Local Governments
- Tech & Telecom
- Higher Education

# A4: State and Local Governments have signed the greatest number of PPAs; Average capacity of PPAs is greatest in the tech sector.



**Q5: Which purchasing option has higher enrollment rates: Green Pricing or Community Choice Aggregation?**

# A5: Community Choice Aggregation programs with default enrollment have 75%-90% enrollment rates.



*CCAs supported 7.7 million MWh of renewable energy; 2.5 million customers participating.*

# Q6: How much of the utility green pricing market do the Top 10 programs account for, by sales?

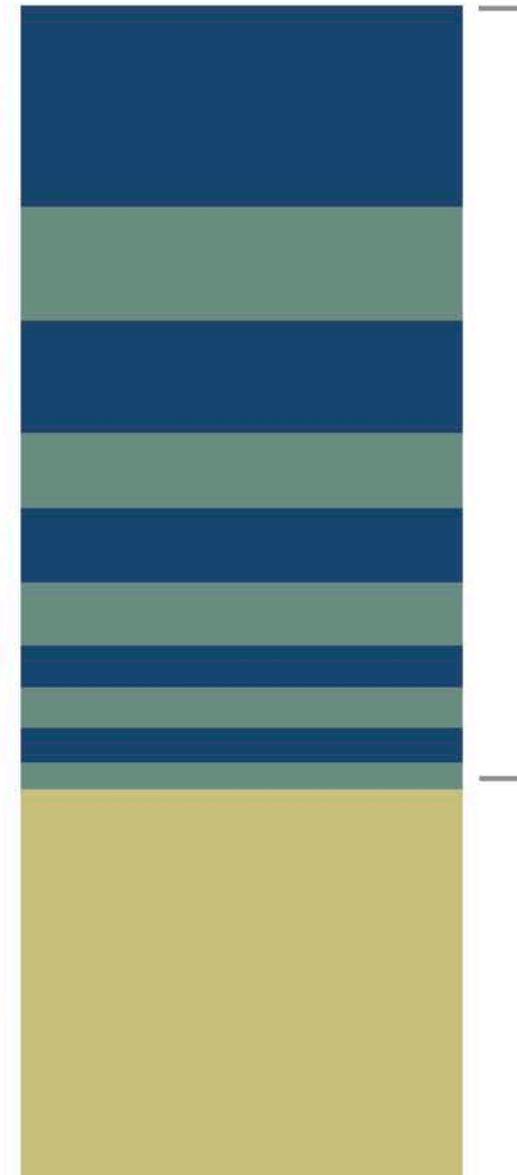
- **57%**
- **67%**
- **87%**
- **97%**

# A6: The top 10 utility green pricing programs, by sales, represented 67% of the green pricing market in 2014.

## Program

## Sales (MWh)

1. Portland General Electric	1,171,978
2. Austin Energy	683,986
3. PacifiCorp	673,977
4. Puget Sound Energy	450,191
5. Sacramento Municipal Utility District	446,995
6. Xcel Energy	377,480
7. Eversource/United Illuminating	250,456
8. Dominion Virginia Power	244,853
9. Tennessee Valley Authority	206,522
10. CPS Energy	170,931
<b>All other programs</b>	<b>2,336,981</b>



**67%**

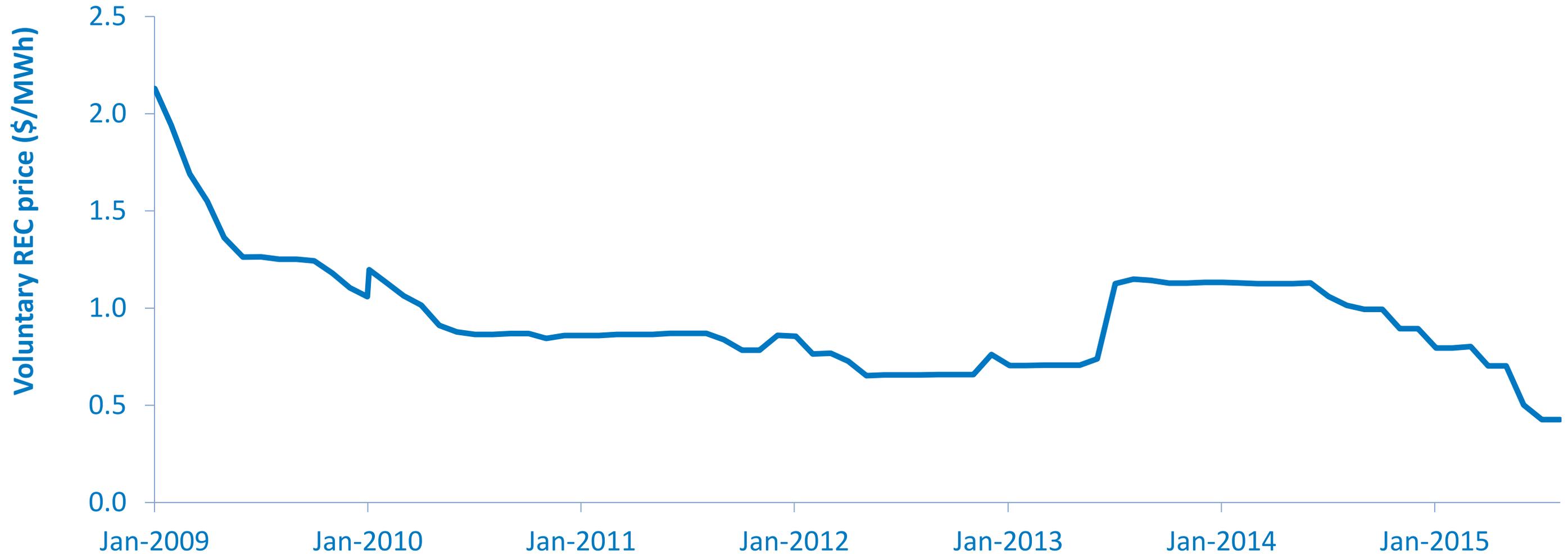
*Utility green pricing sales grew by 5% in 2014, with the growth driven by existing large programs.*

*A few utilities are offering large customer renewable energy tariffs, but to date, only two companies have utilized these options; Apple signed a 20 MW agreement for solar and Switch Ltd. signed a 100 MW agreement.*

## Q7: What happened to voluntary REC pricing in 2015?

- **Increased from 2014**
- **Decreased from 2014**
- **Remained the same**

# A7: Voluntary REC prices declined from 2014 levels to <\$1/MWh.

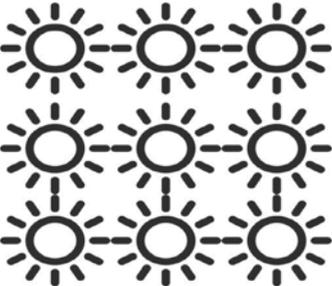
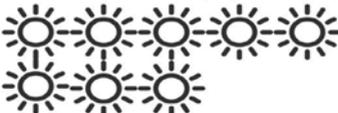
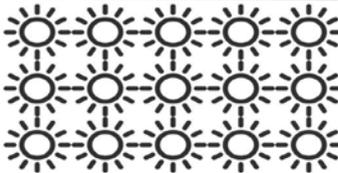
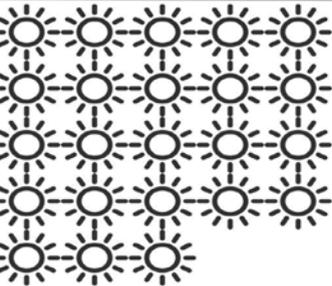


*Voluntary REC prices started declined to less than a \$1/MWh in late 2014. By mid-2015, Voluntary REC prices had fallen to about \$0.50/MWh.*

## **Q8: Community solar projects are:**

- **Scaling up (larger projects)**
- **Scaling down (large numbers of small projects)**
- **Remaining the same**

# A8: Community solar is staying community scale

	2010	2011	2012	2013	2014
Average project size	0.3 MW	2.5 MW	1.3 MW	0.5 MW	0.8 MW
Large projects (>10 MW)					
Medium projects (1-10 MW)					
Small projects (<1 MW)					

*Average project generates about 1,600 MWh per year, the demand of about 150 typical households.  
23 of 32 projects in 2014 were smaller than 1 MW.*

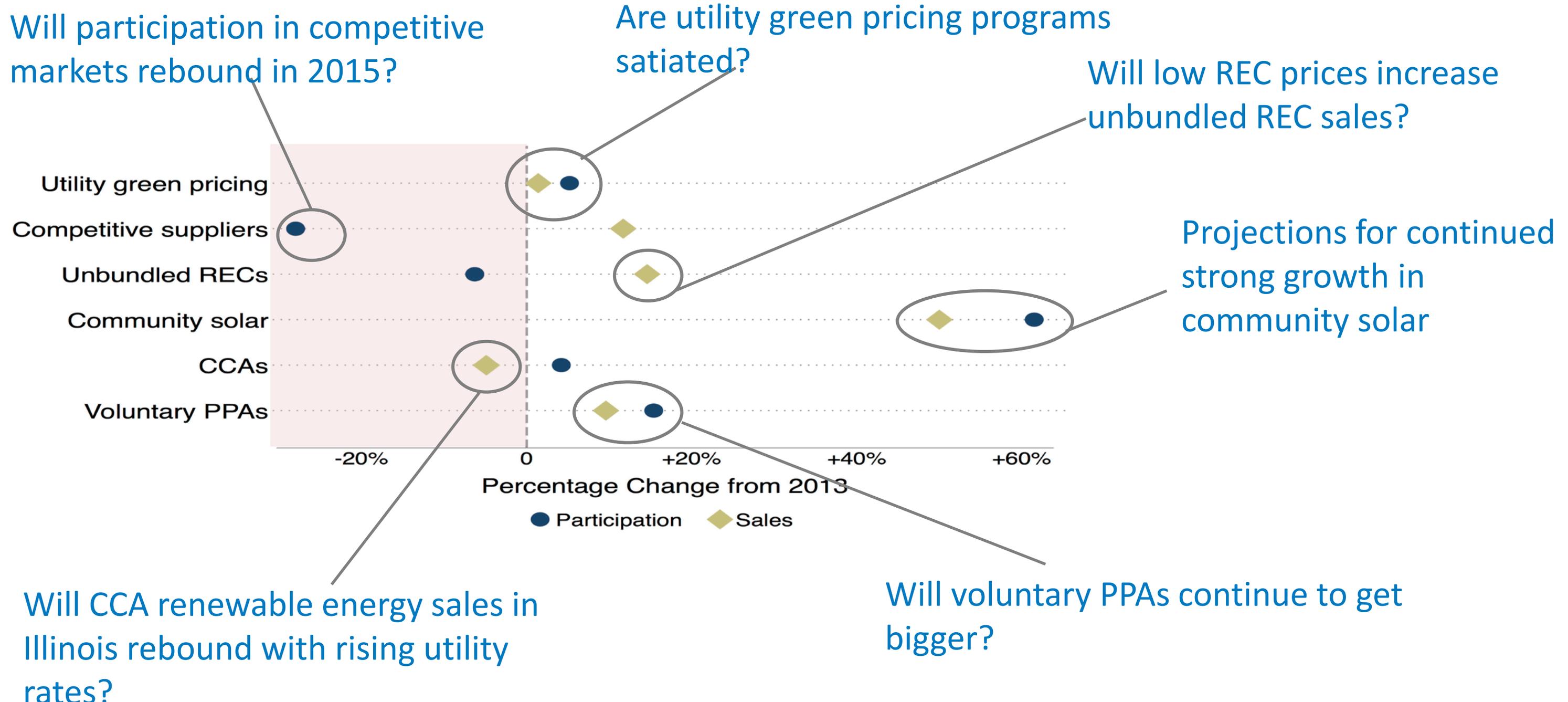
**Q9: What are the implications of the increasing variety of green power options for customers, policymakers, and utilities?**

# A9: More complex green power decisions

	Customer perspective	Policymaker/utility perspective
Utility green pricing	<ul style="list-style-type: none"> <li>+ Widely available</li> <li>- Customers pay a premium over retail electricity rate</li> </ul>	<ul style="list-style-type: none"> <li>+ Expand renewable energy access to a large number of eligible customers</li> <li>- Low participation rates</li> </ul>
Competitive suppliers	<ul style="list-style-type: none"> <li>+ Widely available in re-structured markets</li> <li>- Customers pay a premium for green power option</li> </ul>	<ul style="list-style-type: none"> <li>+ All customers within a re-structured market are eligible to switch electricity service providers</li> <li>- Low participation rates</li> </ul>
Community solar	<ul style="list-style-type: none"> <li>+ Costs are competitive with solar system ownership</li> <li>- Subscribers do not necessarily own RECs</li> </ul>	<ul style="list-style-type: none"> <li>+ High participation rates</li> <li>- Relatively small projects mean low renewable energy output</li> </ul>
CCAs	<ul style="list-style-type: none"> <li>+ CCA rates can be competitive with retail electricity rates</li> <li>- Only allowed in seven states</li> </ul>	<ul style="list-style-type: none"> <li>+ High participation rates</li> <li>- Eligible customers limited by the size of the community</li> </ul>
Voluntary PPAs	<ul style="list-style-type: none"> <li>+ Customers benefit from cost stability of long-term fixed price</li> <li>- Rate is can be higher than retail</li> </ul>	<ul style="list-style-type: none"> <li>+ Large projects result in significant new renewable energy capacity</li> <li>- Generally limited to non-residential customers</li> </ul>

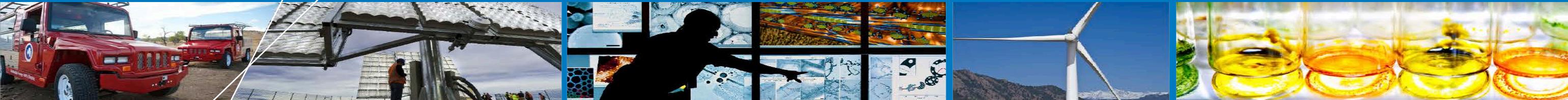
**Q10: What will be the big trends for green power markets in 2015-2016?**

# Using 2014 trends to forecast future trends



**Full report available:**

**<http://greenpower.energy.gov>**



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