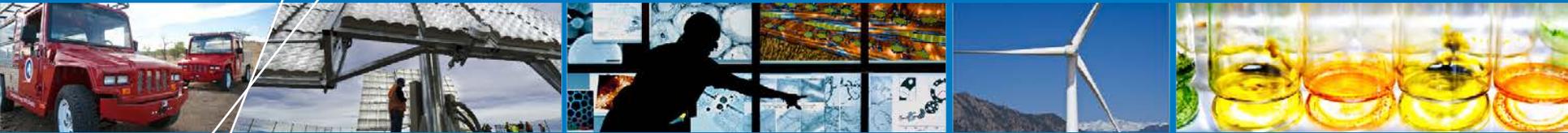


Renewable Energy Markets 101



Jenny Heeter, NREL

**Renewable Energy Markets
Conference 2015**

Washington, D.C.

October 19, 2015

Presentation Outline

- **History of the voluntary market**
- **Voluntary market size and share**
- **Trends in purchasing options**
- **Pricing**
- **Additional resources**

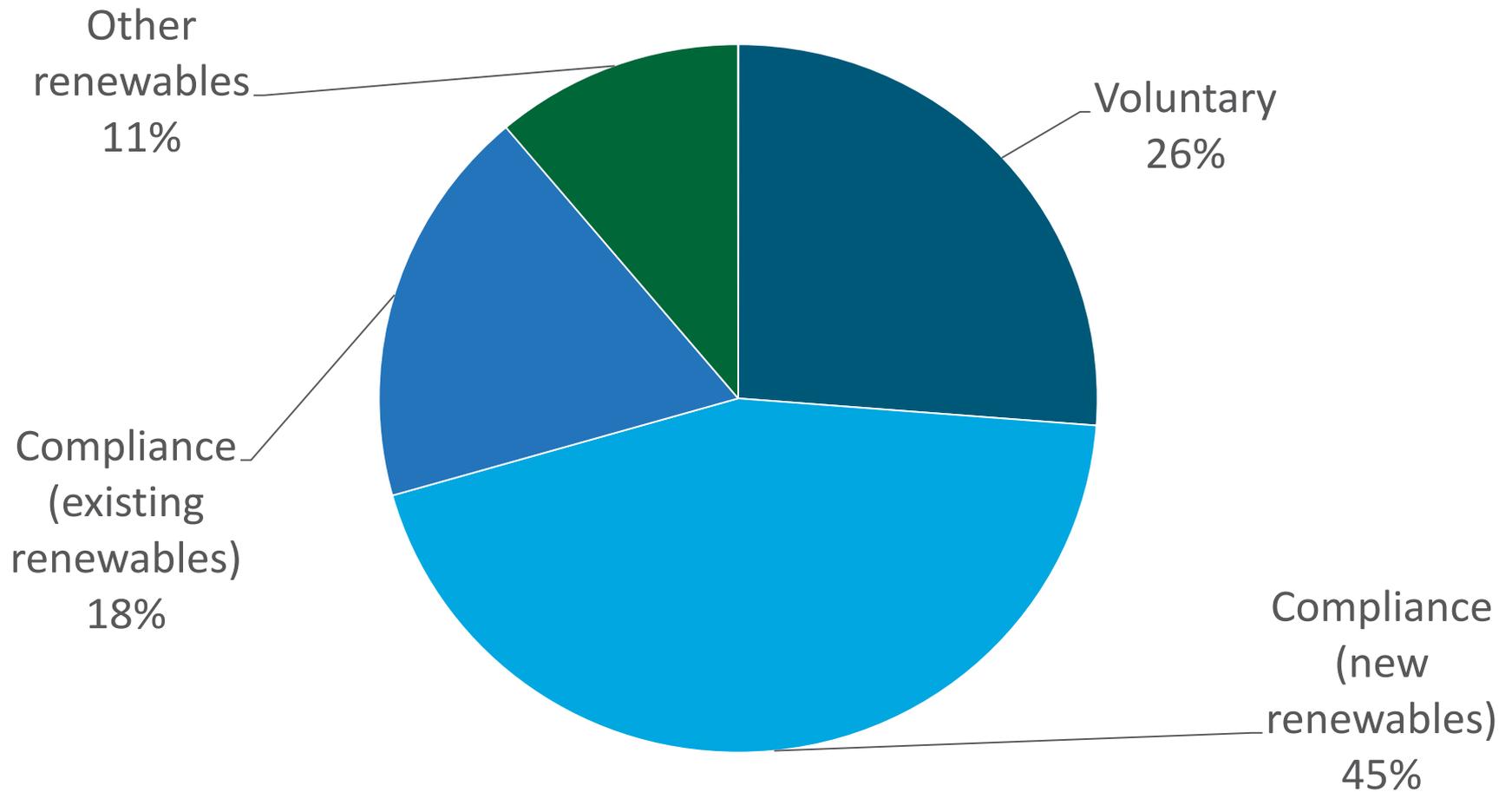
History of the Voluntary Market

- **The voluntary market (or green power market) allows consumers and institutions to purchase renewable electricity to match their electricity needs.**
- **The voluntary market is independent from the compliance market, which includes obligations to meet state renewable portfolio standards (RPSs).**
- **Voluntary options emerged in anticipation of electric market restructuring in the 1990s; utilities wanted to offer choice.**
- **The ability of residential customers to choose suppliers was predicted to drive voluntary purchases; however, non-residential customers have actually been driving the voluntary market.**

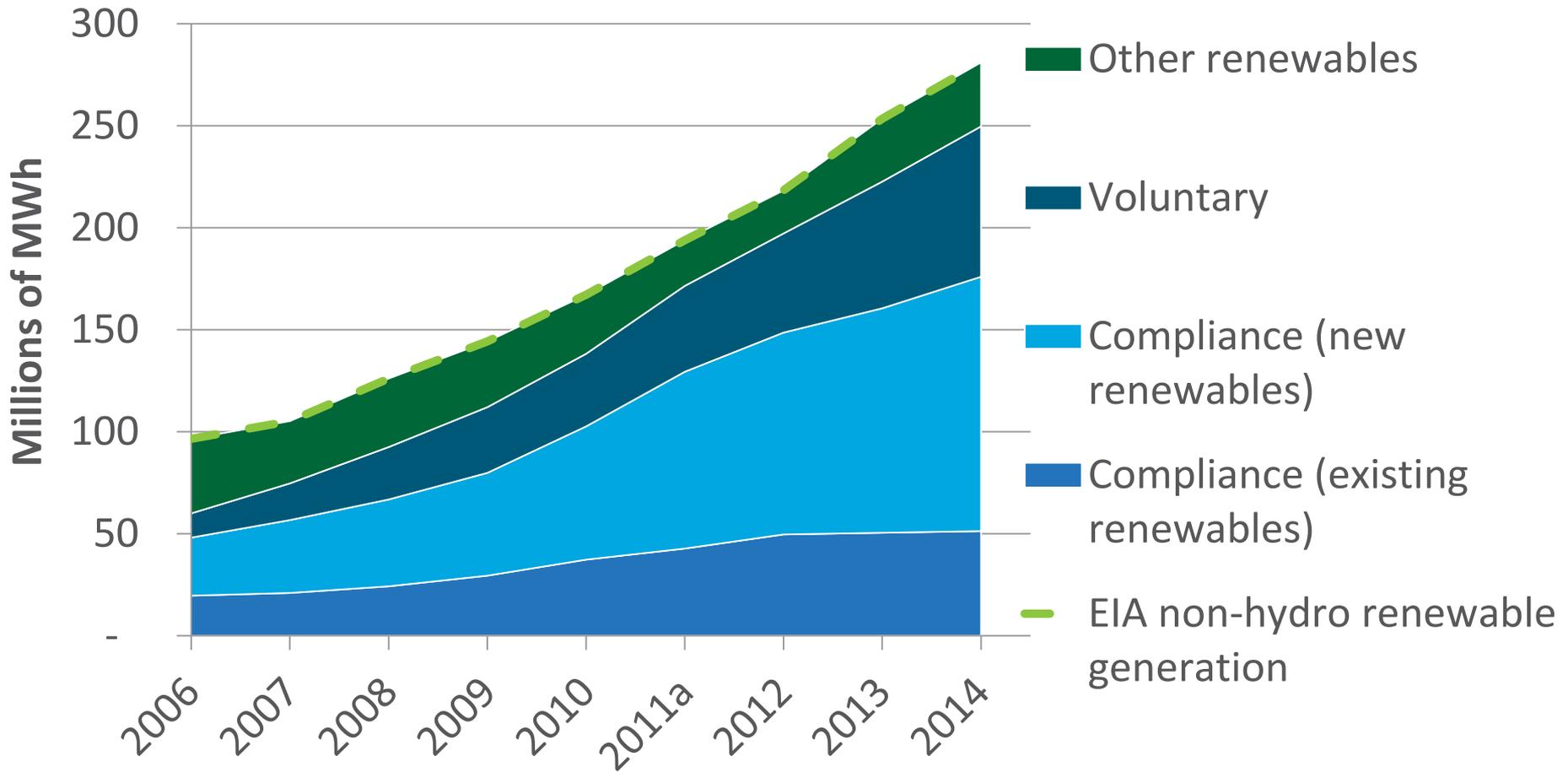
How Large is the Voluntary Market?

**About 2% of total
U.S. electricity
generation.**

Share of non-hydropower renewable generation in 2014

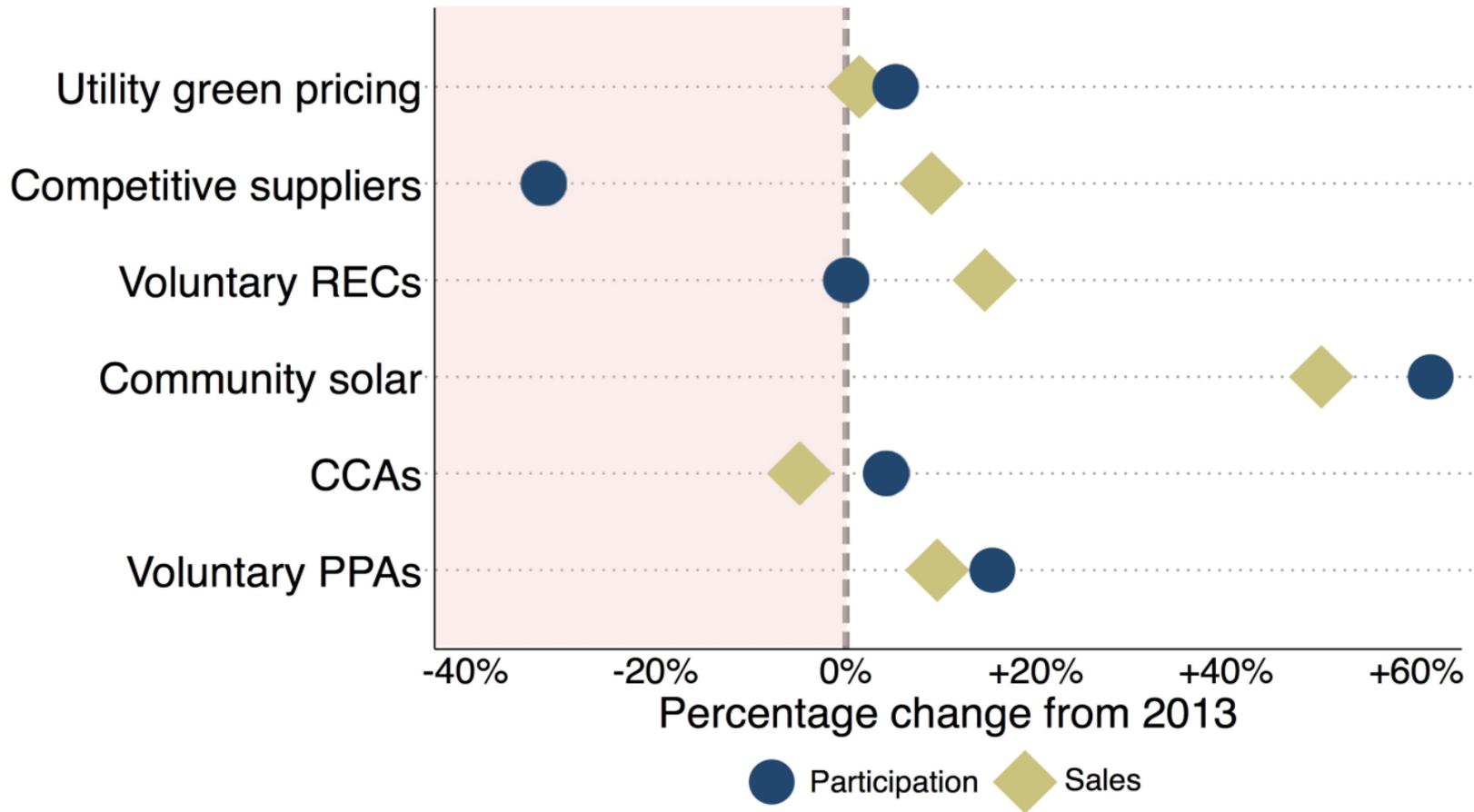


How have market shares changed over time?



^a 2011 voluntary market is an average of 2010 and 2012 data.

Voluntary Market Increases to 74 Million MWh



*The overall voluntary market continues to exhibit strong growth.
The 2015 report includes data on voluntary PPAs for the first time.*

How to Purchase – Traditional Products

- **Utility Green Pricing Programs: About 800 utilities offer programs, though sales and customers are dominated by a small number of programs.**
- **Competitive Suppliers: Products offered in states with retail competition.**
- **Unbundled REC Marketers: Primarily used by large commercial and institutional customers. Unbundled REC products are separate from electricity purchases; RECs can also be part of a bundled product.**

Purchasing Options are Expanding; Value Propositions and REC Treatment Vary

Existing and emerging purchasing methods

Utility green pricing

Competitive supplier

Unbundled RECs

On-site renewables

Power purchase agreements

Community choice aggregation

Community solar

Large customer renewable energy tariff

Direct project investment/crowdfunding

Value proposition

- Match all or part of electricity consumption with renewable energy
- Meet corporate sustainability goals

- Provide location for renewable development
- Potentially lower electricity bill
- Meet municipal GHG reduction targets
- Support local solar development
- Potential price hedge

REC treatment

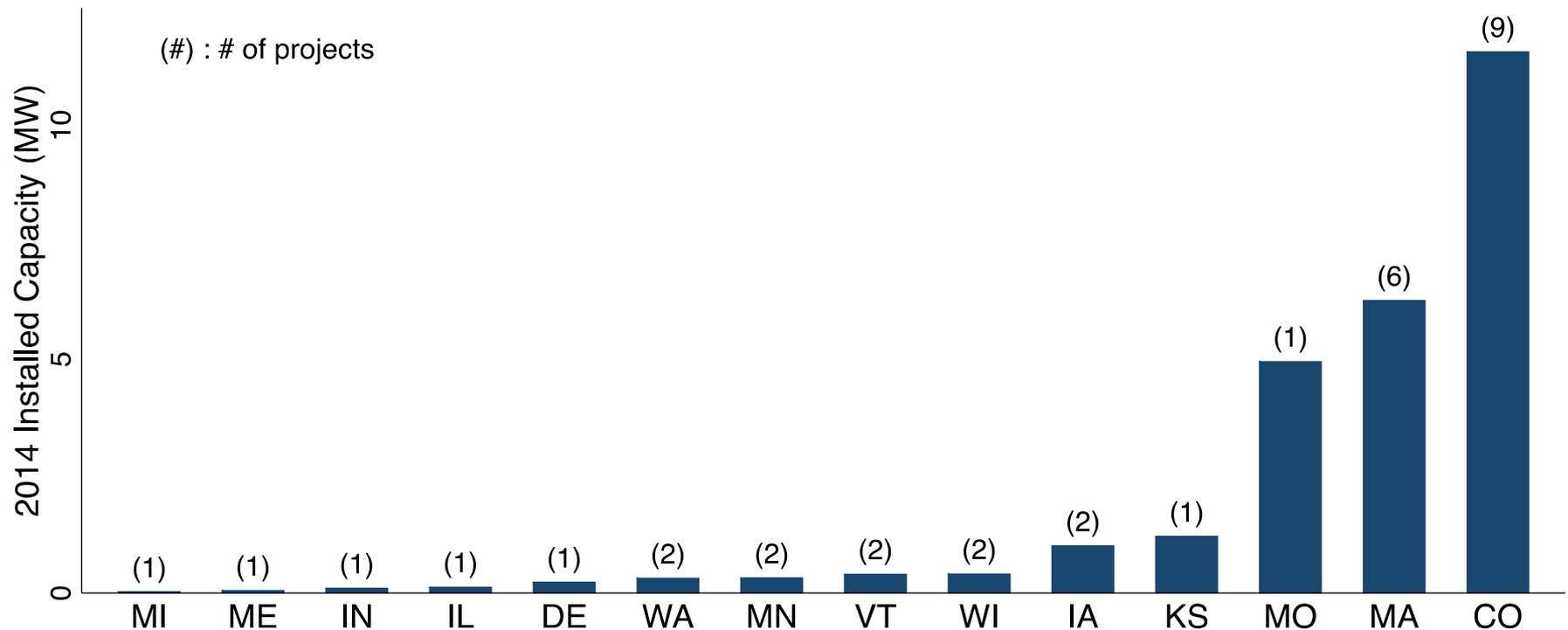
Purchaser keeps RECs

Purchaser does not necessarily keep RECs

Ability to Purchase Green Power

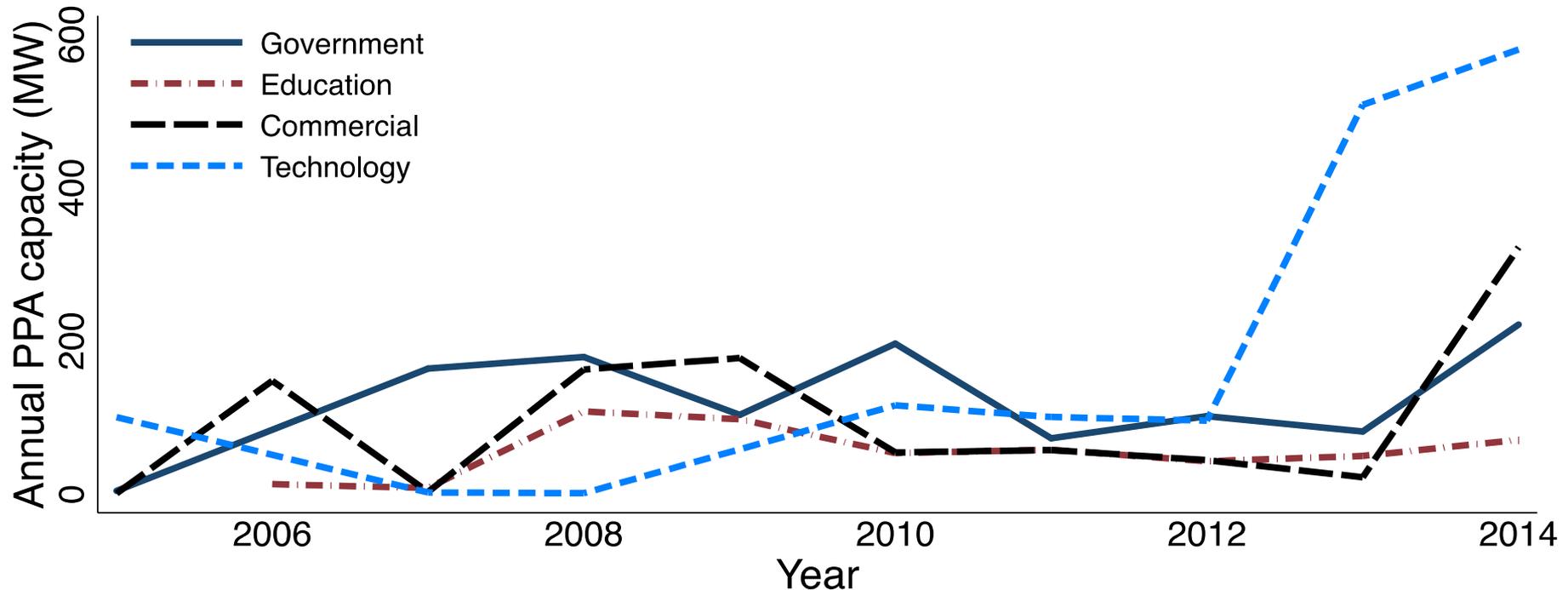
- **Today, about 50% of consumers have the option to buy green power from their utility or electric supplier; all customers have the opportunity to purchase RECs (renewable energy certificates).**

Strong Growth for Community Solar



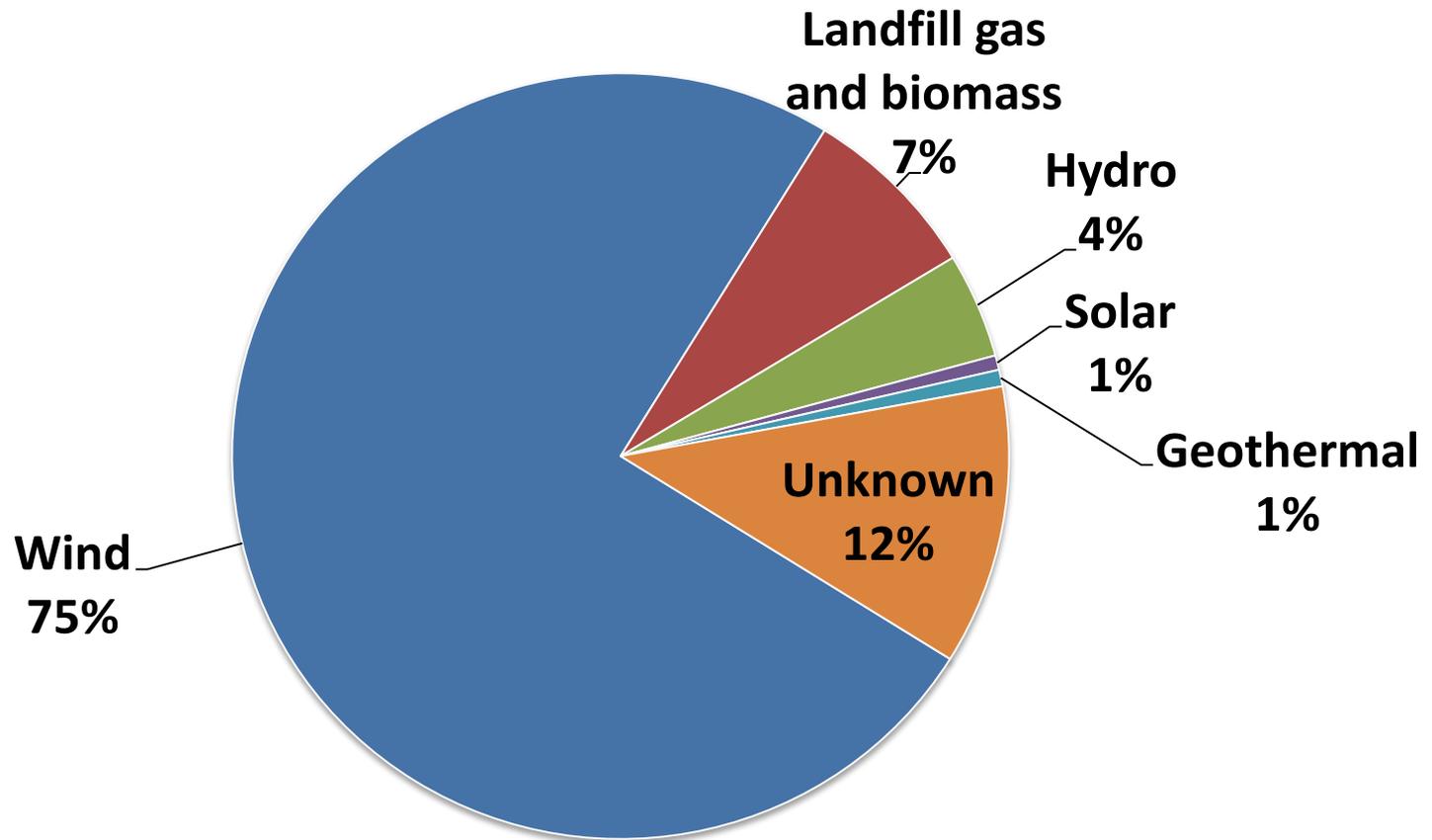
- *Community solar is a popular niche within the voluntary market, and a number of additional programs are planned. The installed capacity to date is still quite small (≈ 90 MW) in the context of the larger green power market.*
- *Participants in community solar programs may or may not retain the RECs, making claims in this sector challenging.*

Increasing Interest in PPAs, Particularly by IT Sector



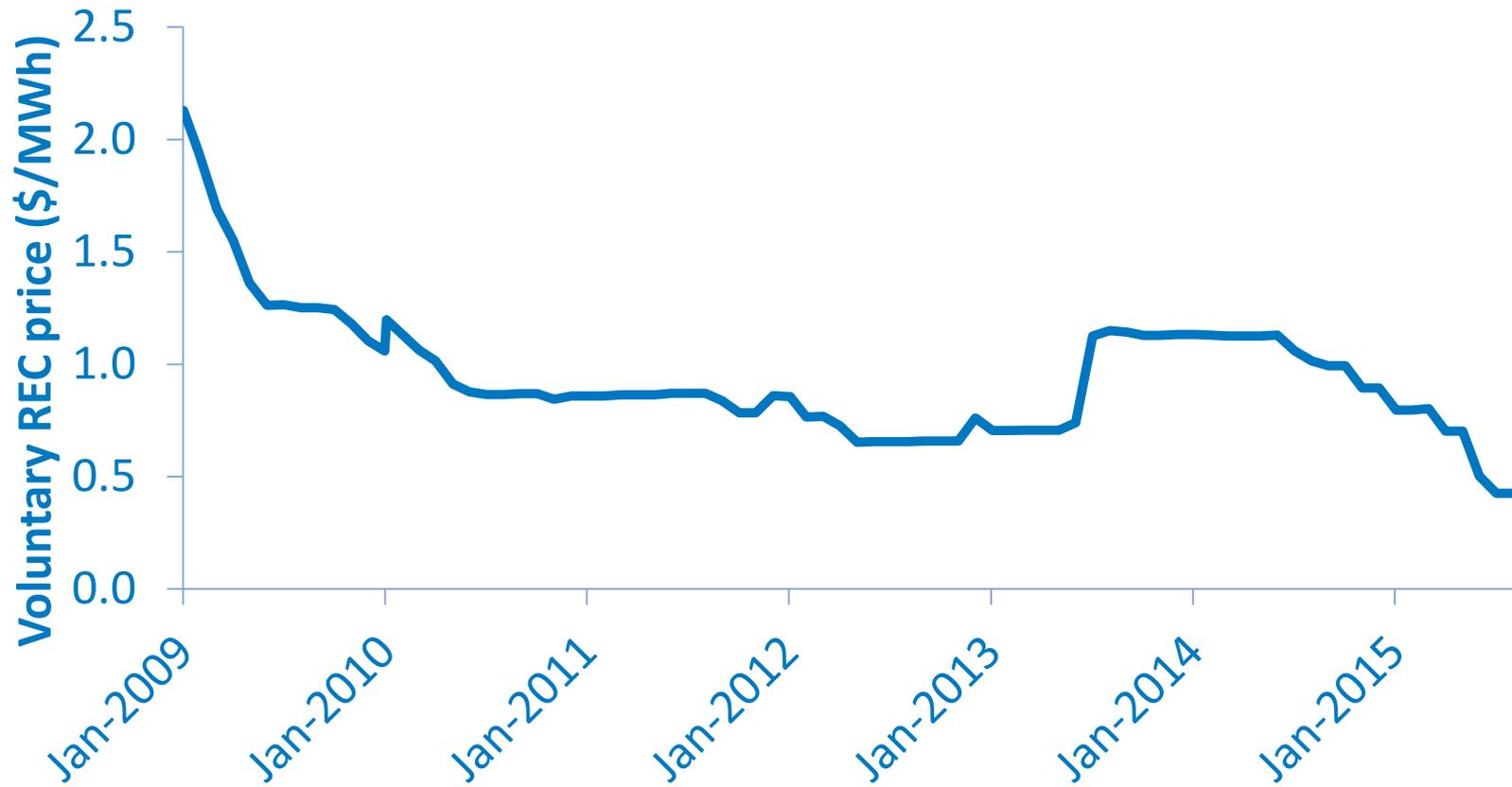
- *113 Information and Communication Technology (ICT) companies used 8.3 million MWh of renewable energy in 2014 (14% of electricity use).*
- *Large renewable purchases by Google, Facebook, Amazon, and others are spurring conversations about new product options.*

Voluntary Supply Dominated by Wind



In 2013, 75% of the supply for the voluntary market came from wind. Solar energy provided approximately 2.5% of supply for utility green pricing programs. In 2014, solar energy provided approximately 8% of supply for utility green pricing programs.

How much do products cost?



Voluntary REC pricing declined in mid-2015 to around \$0.50/MWh.

Resources

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

The Green Power Network

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The Green Power Network provides information on power providers, product offerings, consumer protection, and policies affecting green power markets.

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Find green options by state.

Lead Story

U.S. Higher Education Institutions Move Forward with Renewable Energy

September 2015 - An increasing number of higher education institutions in the United States are pursuing renewable energy projects.

[See full story](#)

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News

Nine Large Companies Take the 100% Renewable Energy Pledge ▶ September 2015

GMP and Yeloha Launch Solar Sharing Program in Vermont ▶ September 2015

Equinix to Power California Data Centers with 100% Renewable Energy ▶ September 2015

More News ▶

Events

NREL Webinar: Emerging Trends in Utility Green Power Production
October 28, 2015
12:00-1:00 p.m. CDT

Publications

Renewable Electricity: How do we get there?
[Renewable Electricity Use by the U.S. Information and Communication Technology \(ICT\) Industry](#) (July 2015)

[Guidelines for Renewable Energy Claims - Guidance For Consumers and Electricity Providers](#) (February 2015)

[Status and Trends in the U.S. Voluntary Green Power Market](#) (2013 Data - November 2014)

[Changing Dynamics in the Voluntary Market](#) (Status Report Presentation - December 2014)

[Renewable Energy Certificate \(REC\) Tracking Systems: Costs & Verification Issues](#) (Presentation - October 2013)

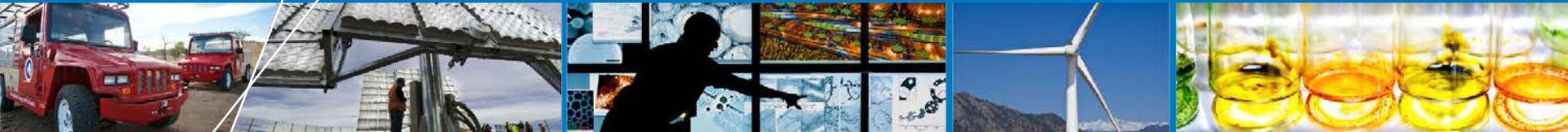
[Current State of the Voluntary Renewable Energy Market](#) (Presentation - September 2013)

[Distributed Solar Incentive Programs: Recent Experience and Best Practices](#)

Power Reports

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