National Journal LEADERSHIP COUNCIL

# Net Energy Metering

## Policies, Factors, and the Energy Landscape of Net Energy Metering in the United States

**May 16, 2016**

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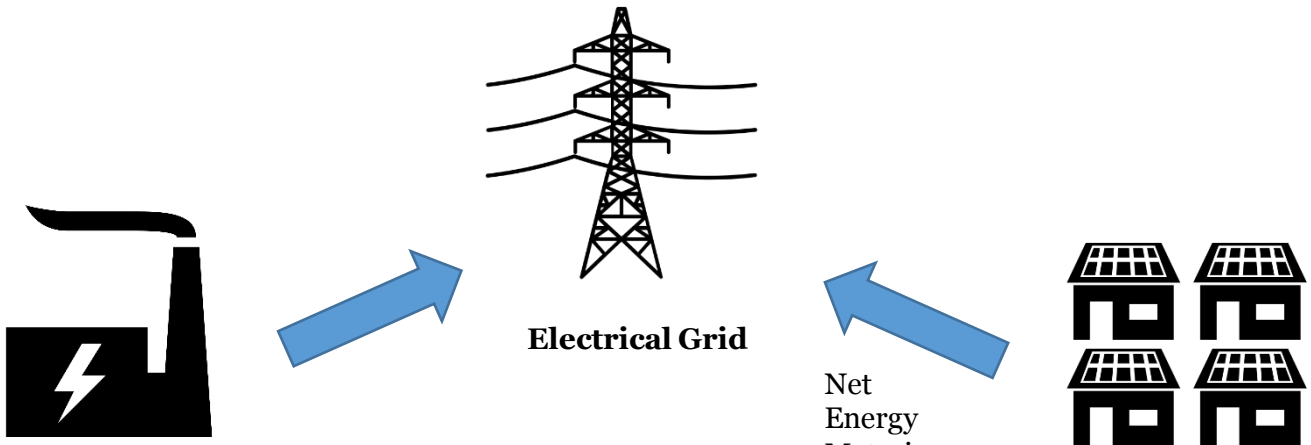
# Centralized and Distributed Generation Contribute to Electrical Grid

## Centralized Distribution and Distributed Generation




**Centralized Generation**

Large scale generation of electricity at centralized facilities, mainly power plants. The vast majority of electricity is produced through centralized generation

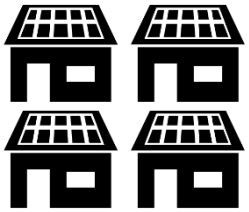
**Distributed Generation**

Electric generation that occurs at or near the use of the electricity. The majority of distributed generation comes from solar photovoltaic panels

*Sources: Justin Blake, "Microgrid," Noun Project, May 4, 2016; EPA, "Energy and Environment," September 2015; Arthur Shlain, "Transmission Tower," Noun Project, May 4, 2016.*

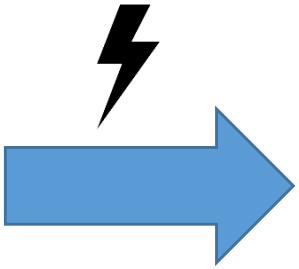
# Net Energy Metering Is When Distributed Generators Sell Excess Energy Back to the Grid

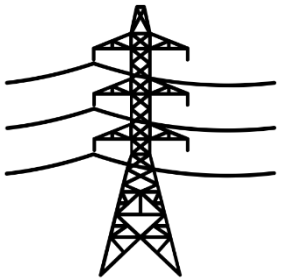
## Basic Definition of Net Metering



**Distributed Generation**

Excess energy that is not used by the producer can be sold to the utility company and put onto the electrical grid



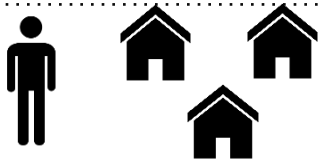
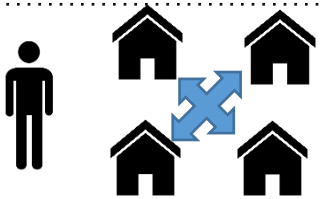
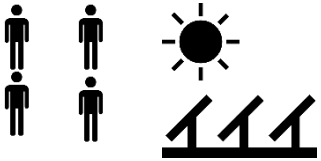


**Electrical Grid**

*Sources: Justin Blake, "Microgrid," Noun Project, May 4, 2016; EPA, "Energy and Environment," Arthur Shlain, "Transmission Tower," Noun Project, May 4, 2016; Sam Smith, "Lightning Bolt," Noun Project, May 9, 2016.*

# Net Energy Metering Usually Varies By the Type of Property Participating and How Credits are Distributed

## Types of Net Metering

| | Type of Net Metering | Members |
|---|---|---|
|  | Conventional Net Metering | • Connects a generating source to single meter<br>• The most common form of net metering<br>• Applies to single houses and buildings |
|  | Aggregated Net Metering | • Allows a property owner with multiple meters on one property or adjacent properties to engage in net metering<br>• Examples: Universities, farm properties with multiple buildings |
|  | Virtual Net Metering | • Allows property owner with multiple meters to distribute net metering credits to different individual accounts<br>• This can apply to non-adjacent properties where one property's excess power can be credited to another property's power usage |
|  | Community Net Metering | • Multiple users can purchase shares in a single net metered system like a solar array located on-site or off-site |

*Sources: Jocelyn Durkay, "Net Metering: Policy Overview and State Legislative Updates," National Conference of State Legislatures; September 26, 2014; Alexander Smith, "Person," Noun Project, May 10, 2016; Mani Amini, "House," Noun Project, May 10, 2016.*

# Net Energy Metering Usually Varies By the Type of Property Participating and How Credits are Distributed

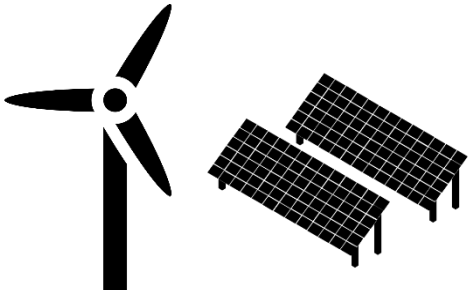
## Main Factors Involved in Net Metering

### Who Can Participate

- Restrictions on amount of capacity a distributed generator can have to participate
- Capacity level can differ depending on the type of net metering customer
- States can differ on which technologies can qualify (wind, solar, geothermal etc.)

### Pricing and Compensation

- State utilities can differ on what rates they pay distributed generators: retail or wholesale
- Utilities differ on how long credits for distributed generation lasts
- Some allow for rollover past a year. Others apply credits to next month



### REC Ownership

- REC (Renewable energy credit) can be owned either by the distributed generator or the utility generator
- REC ownership can be important since some utilities need to meet renewable energy portfolio requirements

*Sources: Jocelyn Durkay, "Net Metering: Policy Overview and State Legislative Updates," National Conference of State Legislatures; September 26, 2014; Gira Park, "Money Bag," Noun Project, May 10, 2016; Lance Hambley,"Solar Panel,"" Noun Project, May 10, 2016; Mani Amini, "House," Noun Project, May 10, 2016; Joa Proenca, "Building," Noun Project, May 12, 2016.*

# State Utilities Tend to Pay DG Retail Rates For Energy Sold Back Even Though They Include Fixed Costs

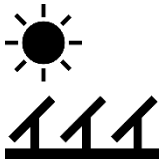
## Costs Reflected in Retail and Wholesale Rates

| Types of Pricing | Marginal Cost of Producing Energy | Maintaining Electrical Grid Infrastructure | Transmitting Electricity Through the Electrical Grid | Customer Service |
|---|---|---|---|---|
| Retail Price | ✖ | ✖ | ✖ | ✖ |
| Wholesale Price | ✖ | | | |

*Sources: Jocelyn Durkay, "Net Metering: Policy Overview and State Legislative Updates," National Conference of State Legislatures; September 26, 2014; Edison Electrical Institute, "Straight Talk About Net Metering," September 2013.*

# Renewable Energy Companies Argue Retail Rates is True Reflection Because of the Cost Savings of Reduced Use

## Arguments For and Against Paying Retail Rates



**Pro:** Helps state utilities hit renewable energy goals

**Pro:** Reduces the need to build more central energy capacity

**Pro:** Reduces fossil fuel consumption and cuts emissions and other harmful pollutants from energy production

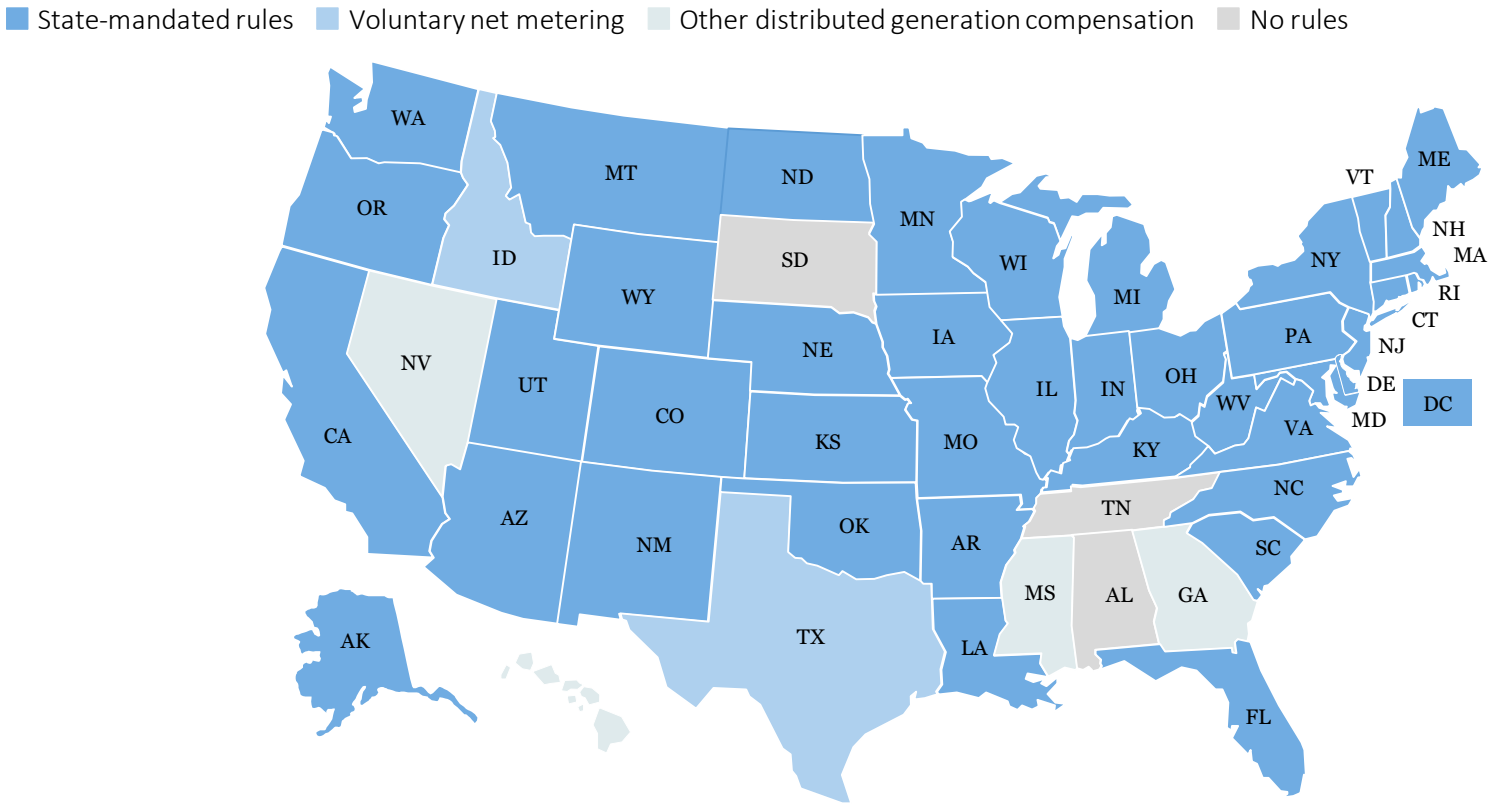
**Con:** Shifts fixed costs like grid maintenance onto other consumers

**Con:** Distributed generators tend to be wealthier so the cost shift is on lower and middle-income consumers contributing to regressive tax subsidy

*Sources: National Rural Electrical Cooperative Association, "Distributed Generation: Finding a Sustainable Path Forward," 2014; Aldric Rodriguez Iborra, "Limiting Emissions," Noun Project, May 12, 2016; Gregor Cresnar, "Seller," Noun Project, May 12, 2016.*

# The Vast Majority of States Have Some Form of Net Metering Rules

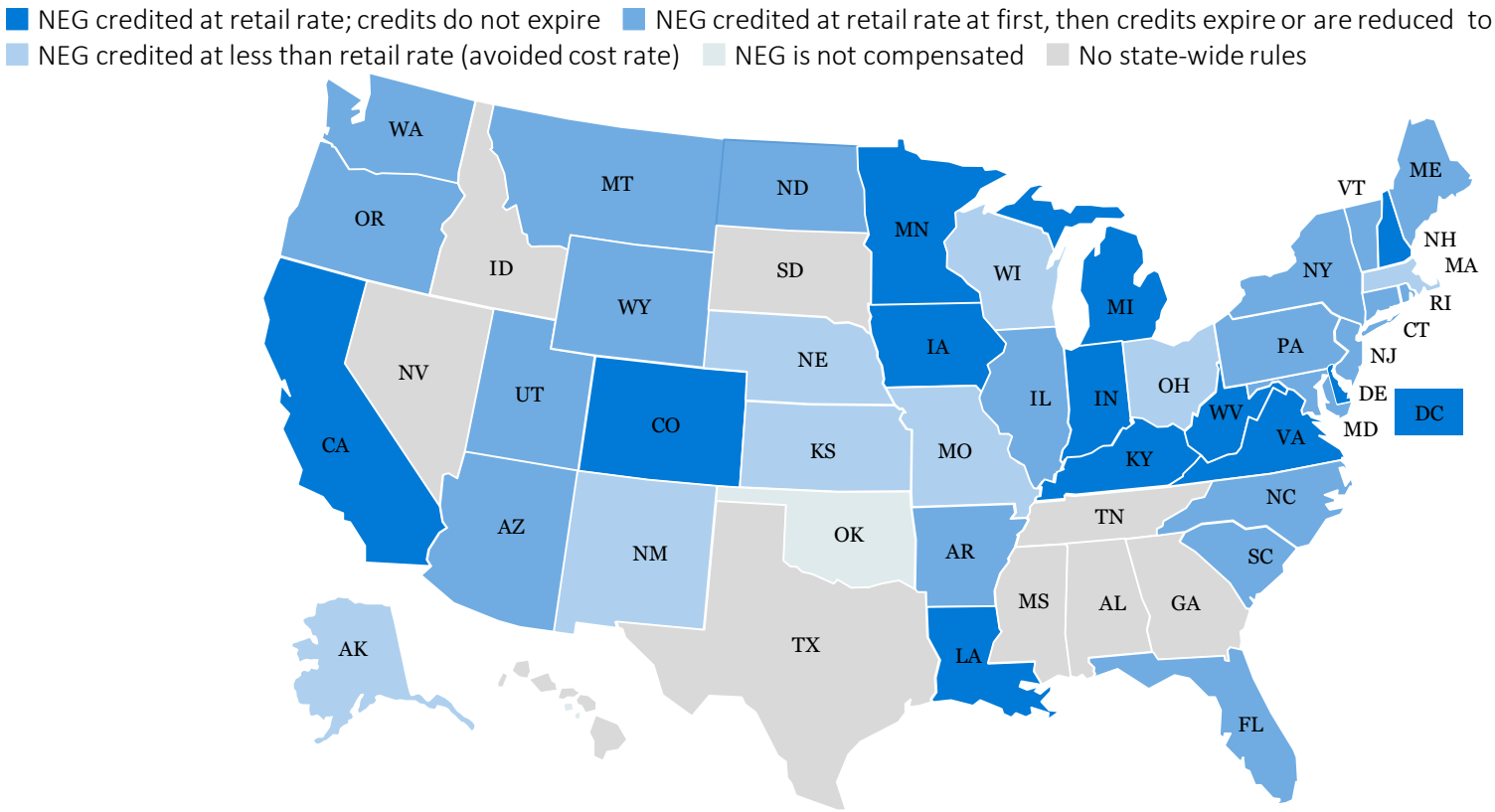
## States That Have Net Metering Laws




*Sources: Database for State Incentives for Renewables and Efficiency, "Net Energy Metering Map," February 2016.*

# Majority of States Provide Net Generation Excess Credit At Retail Rates, But Differ on When Those Rates Are Reduced

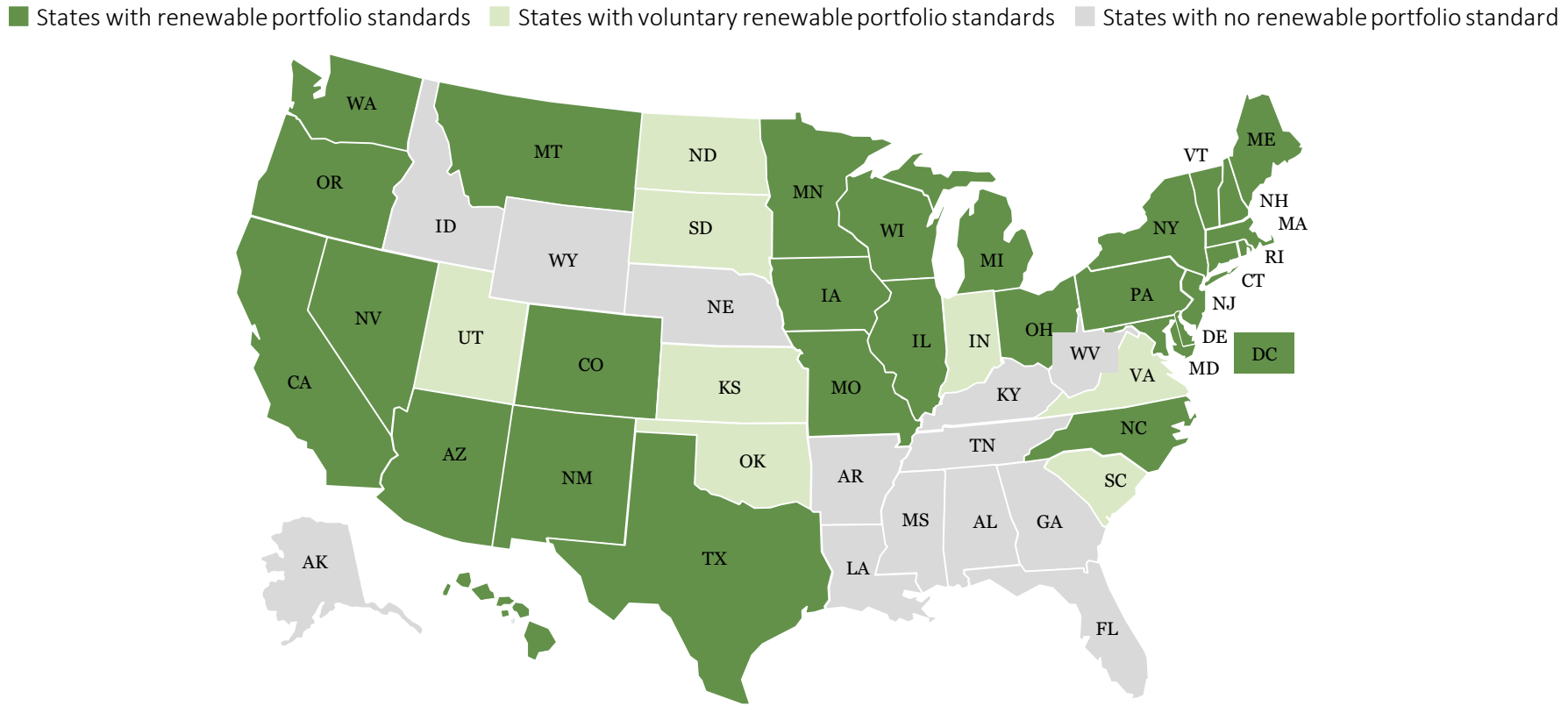
## States That Have Monthly Net Generation Excess Credit (NEG) Laws




*Sources: Database for State Incentives for Renewables and Efficiency, "Net Energy Metering Policies-Customer Credits for Monthly Net Excess Generation," January 2016*

# The Majority of States Have Renewable Portfolio Standards For Their Utilities

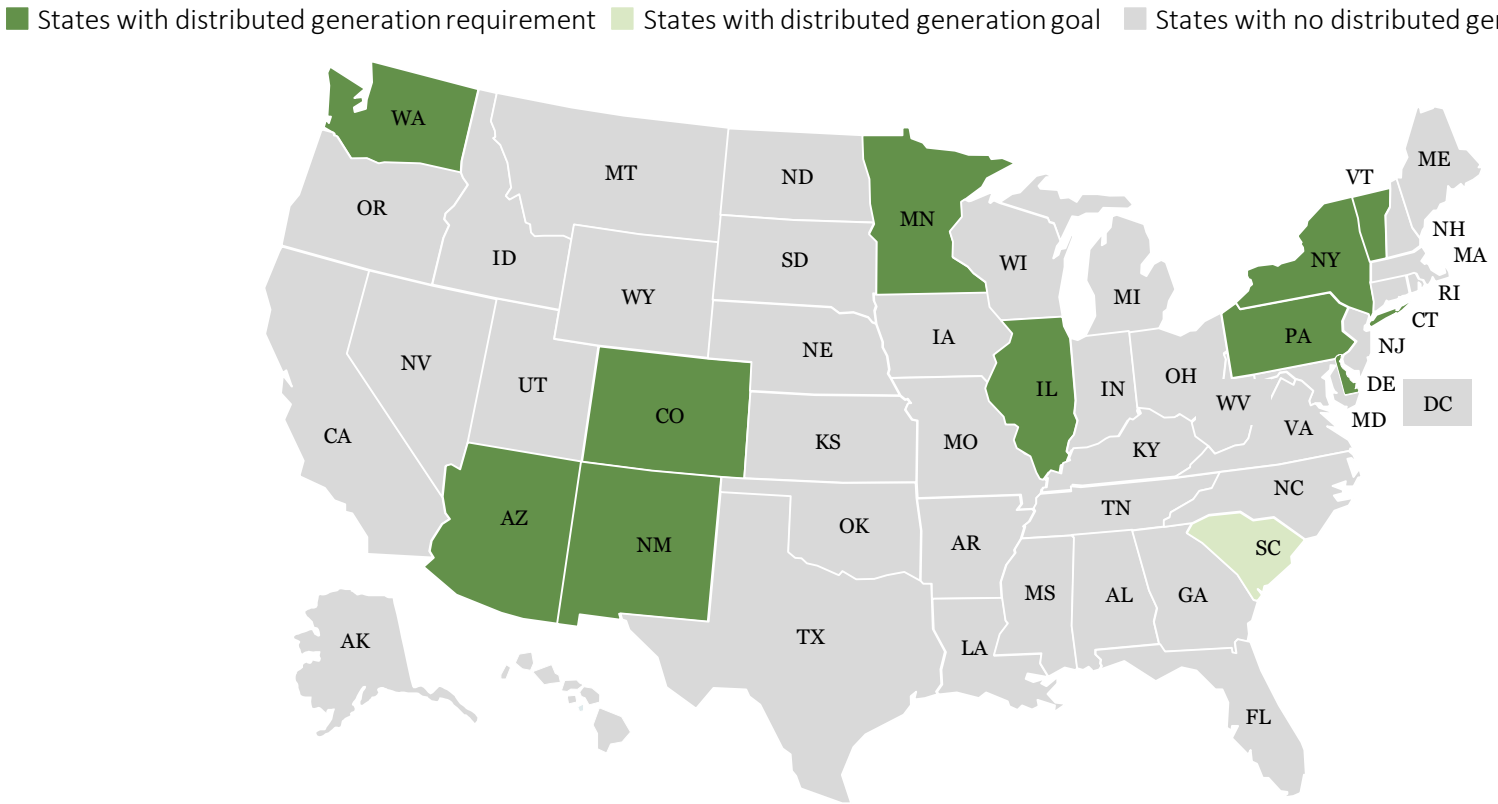
## States That Have Renewable Portfolio Standards




*Sources: Jocelyn Durkay, "State Renewable Portfolio Standards and Goals," National Conference of State Legsilatures, March 3, 2016.*

# Some States Require Utilities to Have a Certain Percentage of Their Power Come From Distributed Generators

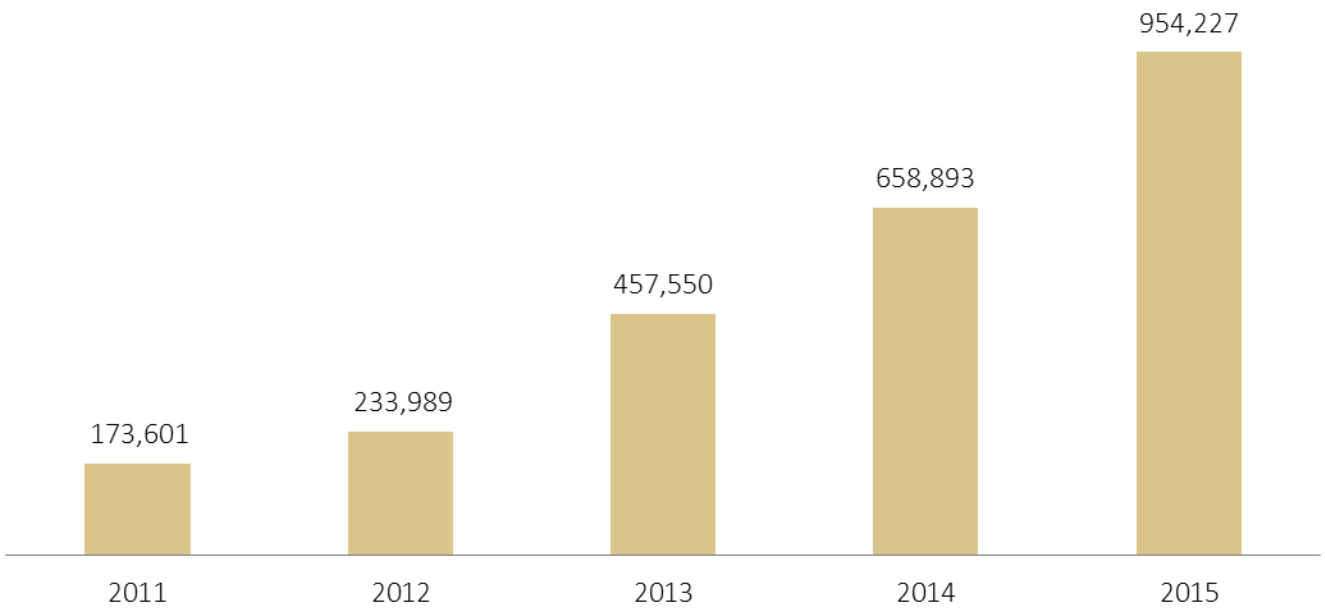
## States That Have Distributed Generation Standards




*Sources: Jocelyn Durkay, "State Renewable Portfolio Standards and Goals," National Conference of State Legsilatures, March 3, 2016.*

# Solar Net Energy Metering Has Had a Rapidly Expanding Customer Base

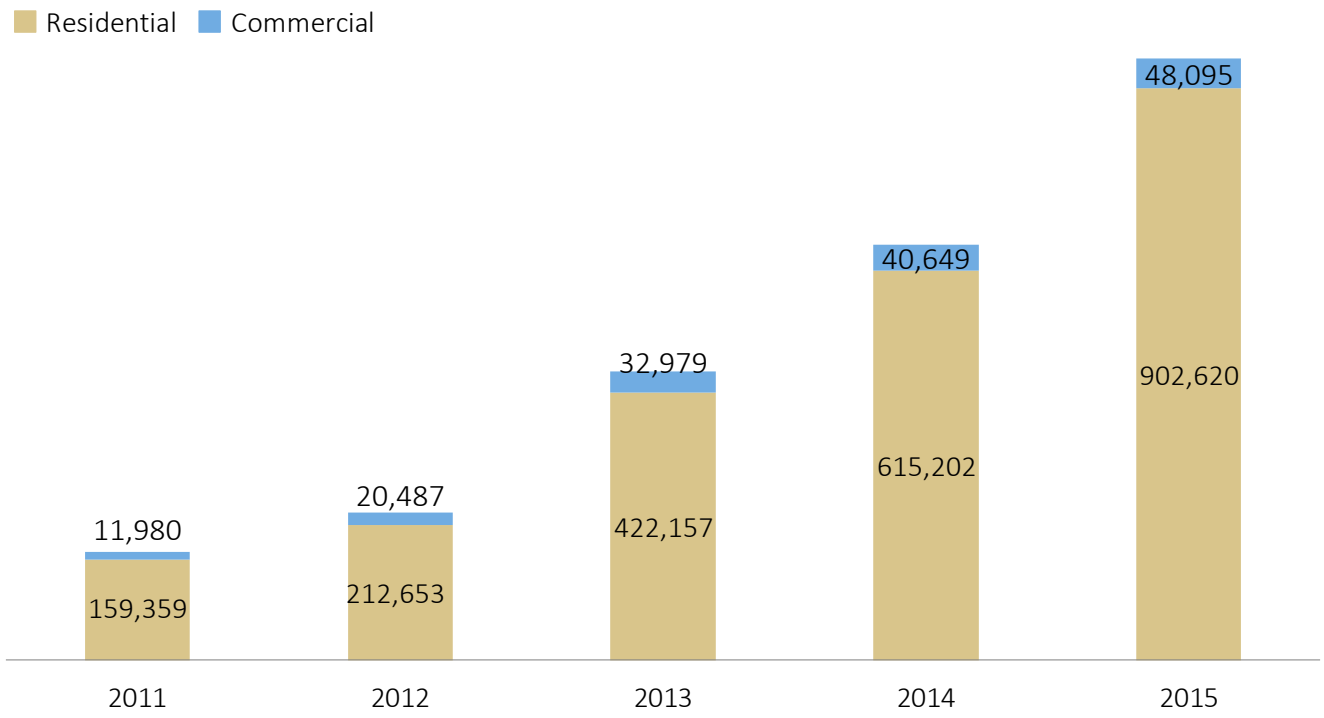
## Amount of Solar Net Meter Customers




*Source: EIA, "Form EIA-826 Detailed Data: Net Metering," May 2, 2016.*

# The Vast Majority of Solar Net Energy Metering Customers Are Residential

## Amount of Solar Net Meter Customers By Category*




| Year | Industrial Customers |
|---|---|
| 2011 | 2,262 |
| 2012 | 849 |
| 2013 | 2,414 |
| 2014 | 3,042 |
| 2015 | 3,512 |

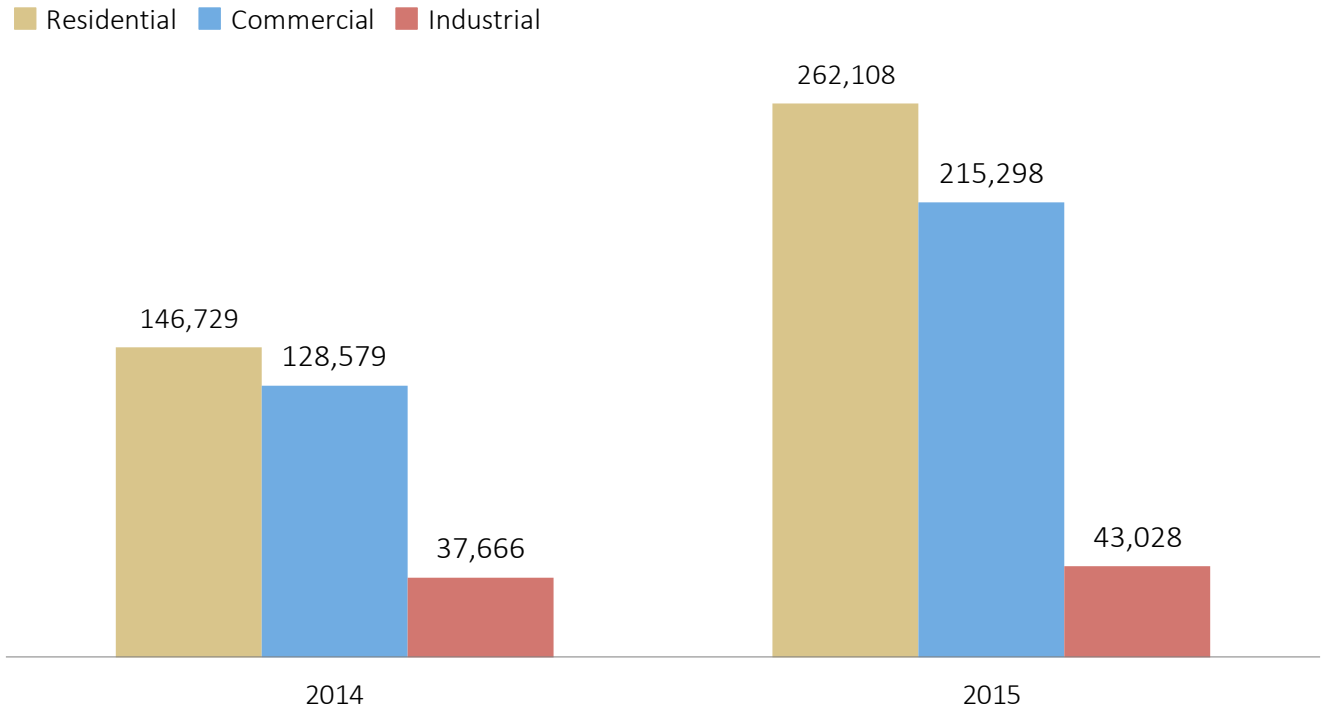
*Industrial customers listed above not graphed due to small size

*Source: EIA, "Form EIA-826 Detailed Data: Net Metering," May 2, 2016.*

# There Are Fewer Commercial Than Residential Customers, But They Sell Back Almost the Same Amount of Energy

## Amount of Megawatts Per Hour Sold Back by Solar Net Meter Users

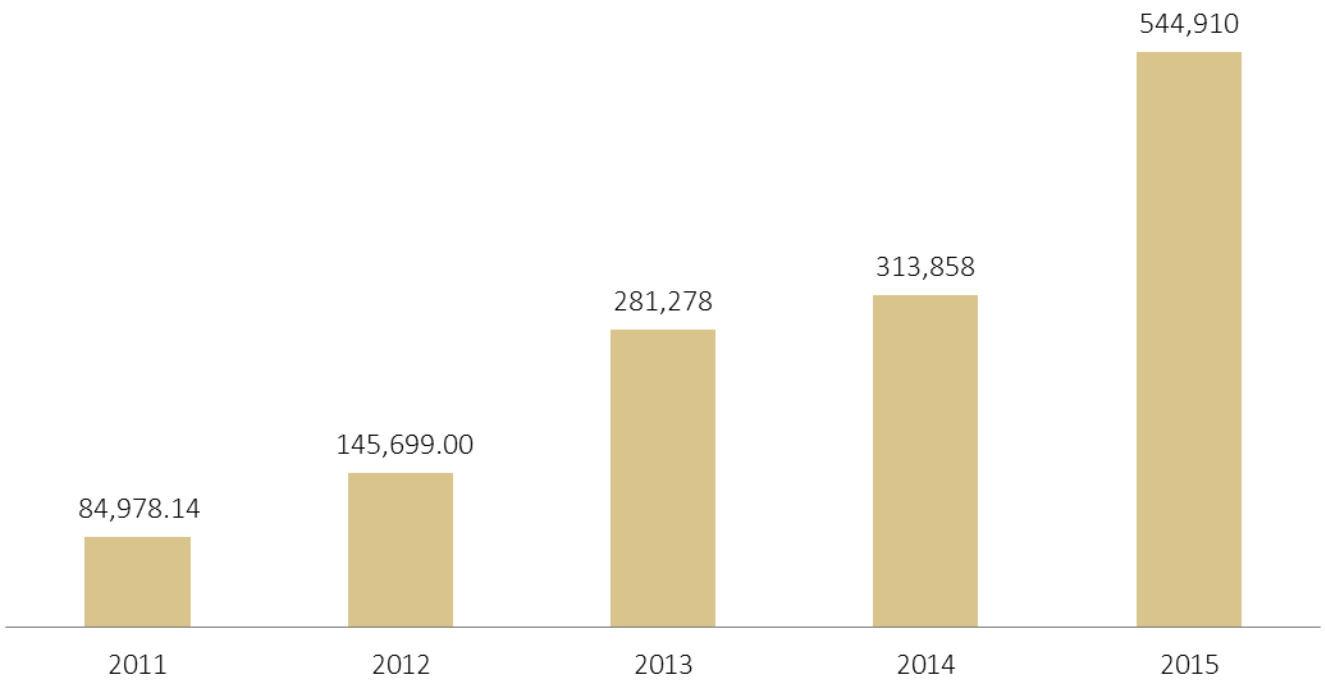
*By Category*




*Source: EIA, "Form EIA-826 Detailed Data: Net Metering," May 2, 2016.*

# The Amount of Solar Energy Net Meter Customers Has Sold Has Increased Sixfold in the Past Five Years

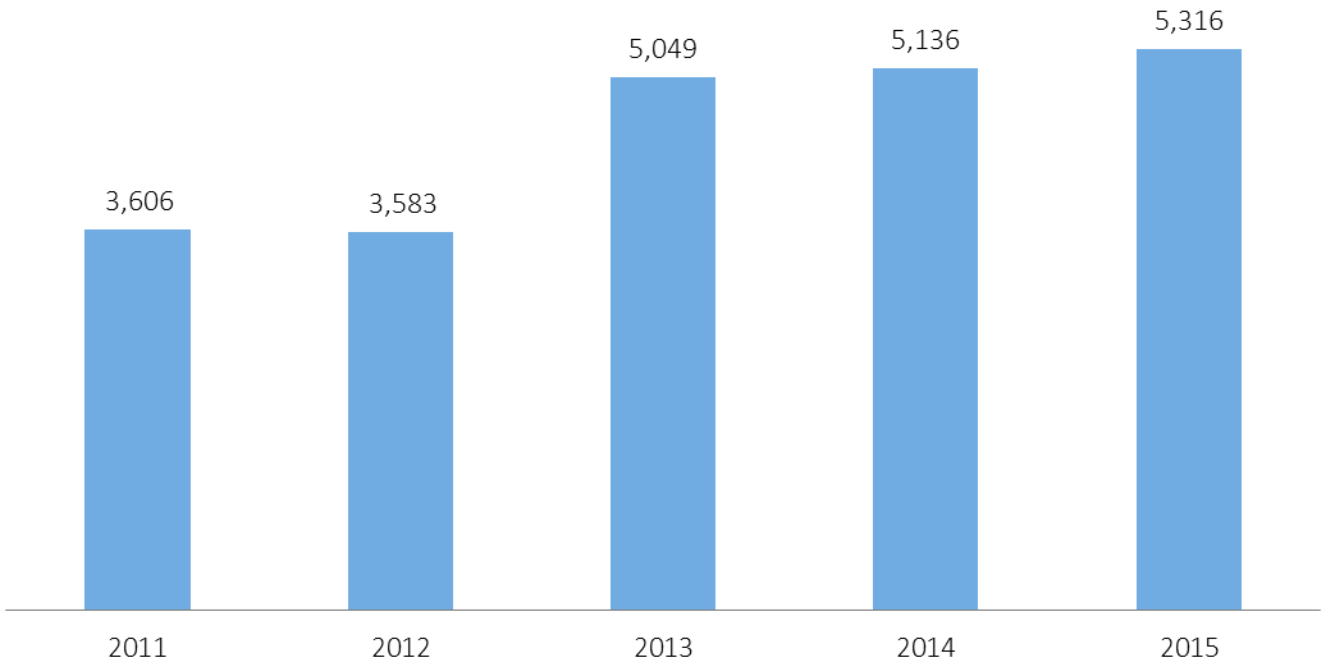
## Amount of Megawatts Per Hour Sold Back by Solar Net Meter Users




*Source: EIA, "Form EIA-826 Detailed Data: Net Metering," May 2, 2016.*

# Wind Net Meter Customers Has Increased Slightly Over the Past Five Years

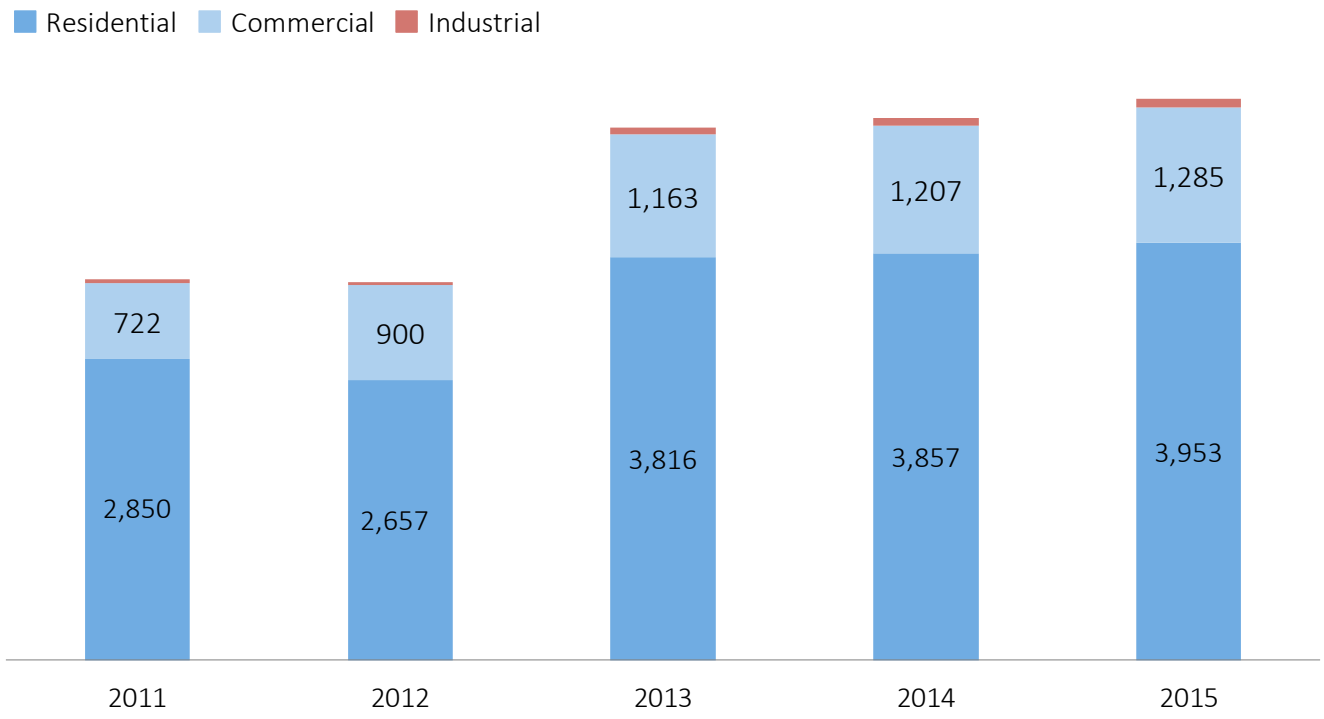
## Amount of Wind Net Meter Customers




*Source: EIA, "Form EIA-826 Detailed Data: Net Metering," May 2, 2016.*

# Compared to Solar, The Ratio Between Residential and Commercial Net Meter Customers is More Even

## Amount of Wind Net Meter Customers By Category

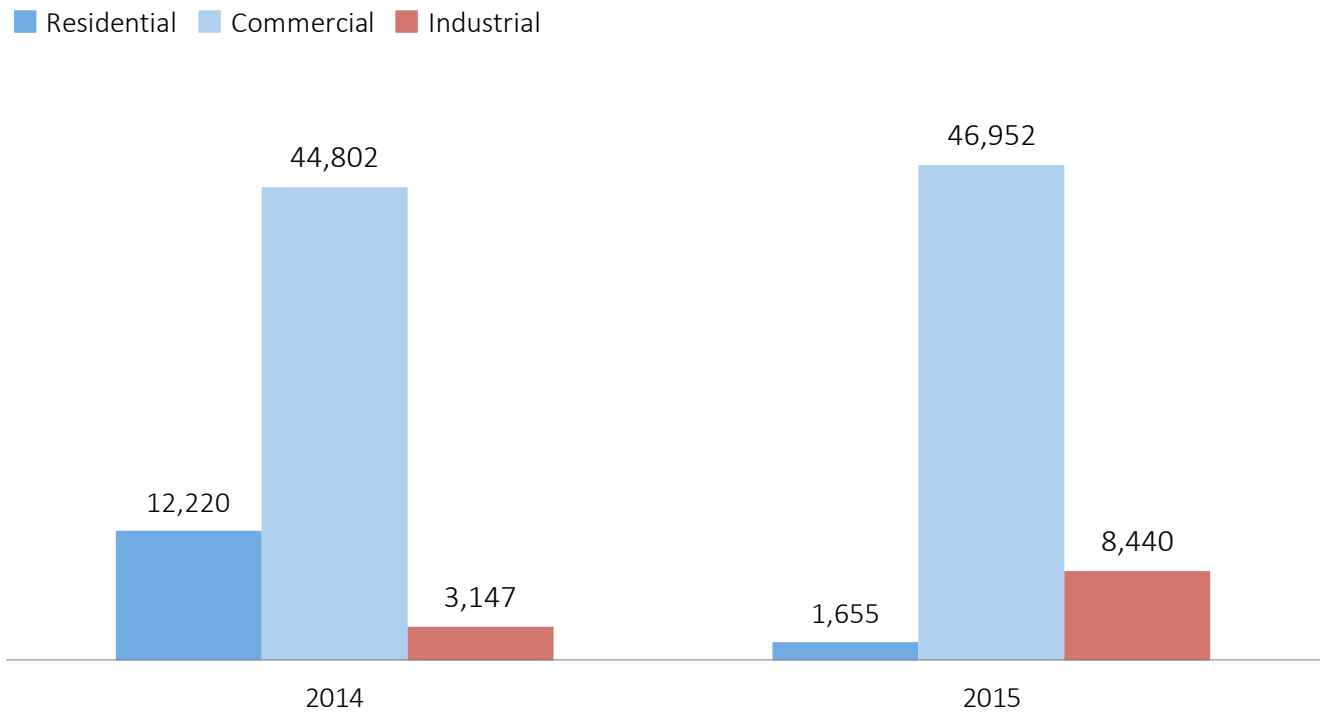



*Source: EIA, "Form EIA-826 Detailed Data: Net Metering," May 2, 2016.*

# Commercial Wind Net Meter Customers Sell Back the Vast Majority of Total Wind Energy

## Amount of Megawatts Per Hour Sold Back by Wind Net Meter Users

*By Category*

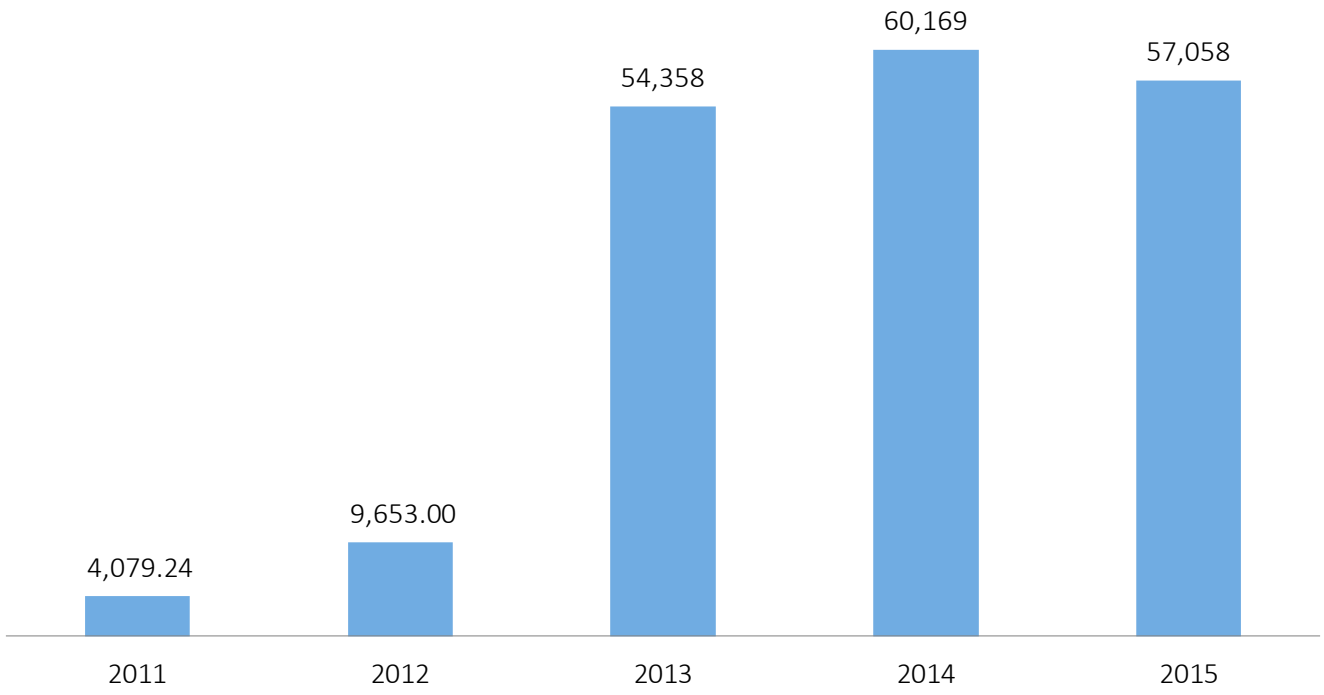



*Source: EIA, "Form EIA-826 Detailed Data: Net Metering," May 2, 2016.*

# The Amount of Wind Energy Net Meter Users Has Sold Back Experienced a Major Jump From 2012 to 2013

## Amount of Megawatts Per Hour Sold Back by Wind Net Meter Users

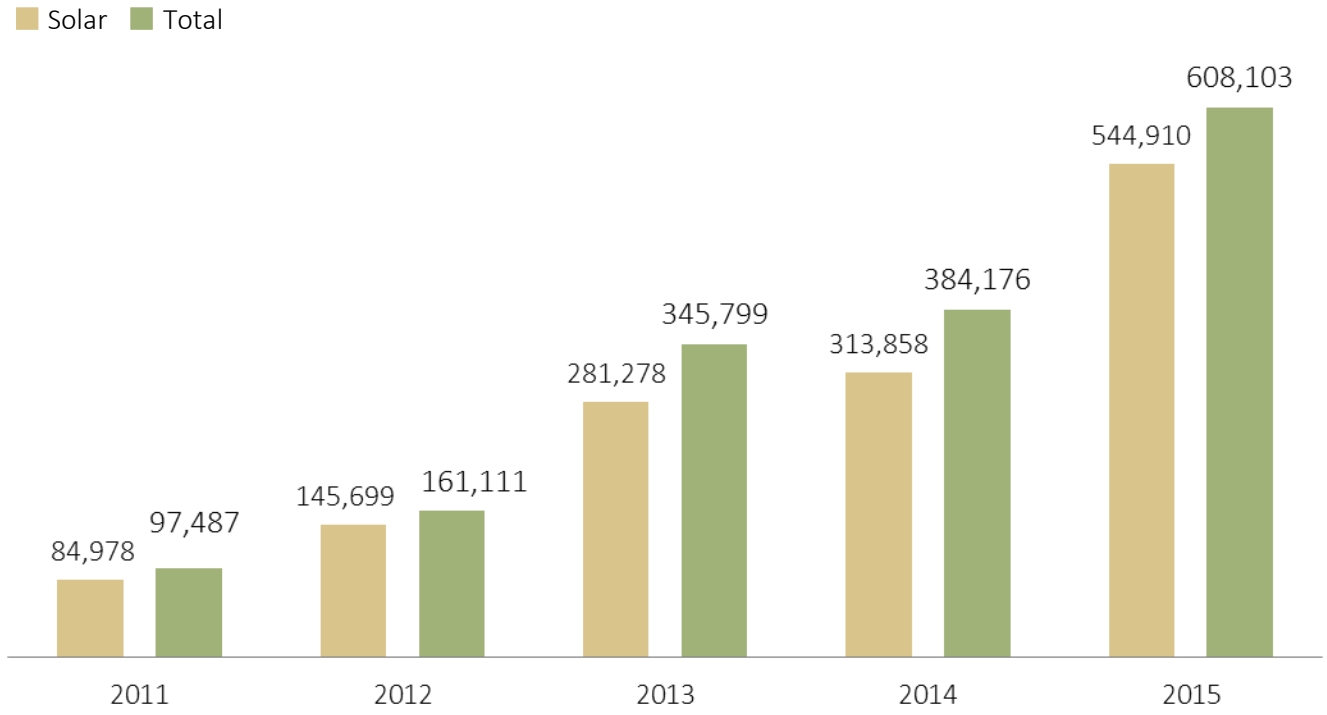
*For Wind Net Meter Users*




*Source: EIA, "Form EIA-826 Detailed Data: Net Metering," May 2, 2016.*

# Solar Contributes Over 90% of the Total Energy Sold Back By Net Energy Meter Users

## Amount of Megawatts Per Hour Sold Back by Net Meter Users in 2015




*Source: EIA, "Form EIA-826 Detailed Data: Net Metering," May 2, 2016.*