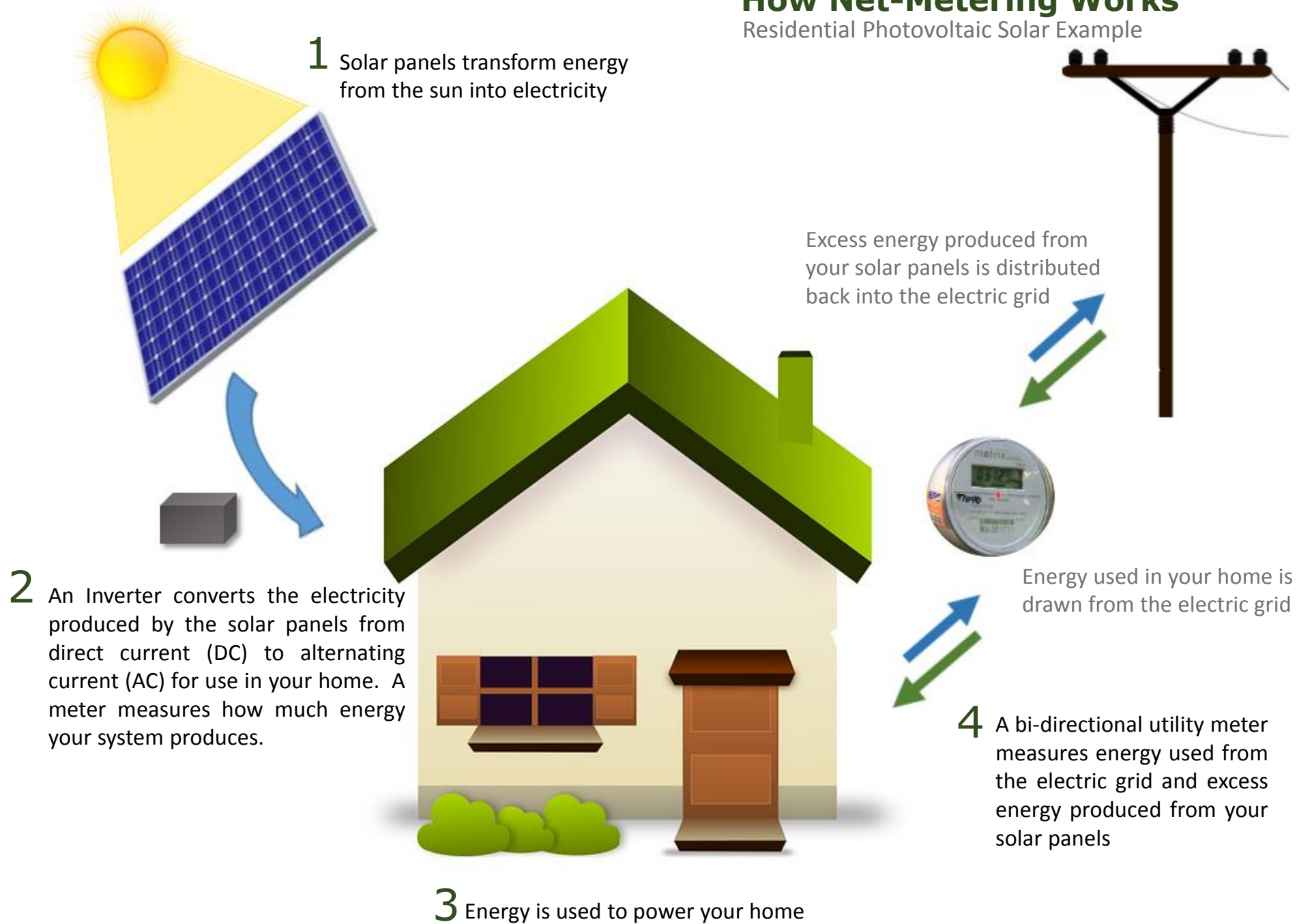


Vermont Public Service Board  
Rule 5.100 – Net-metering

# How Net-Metering Works

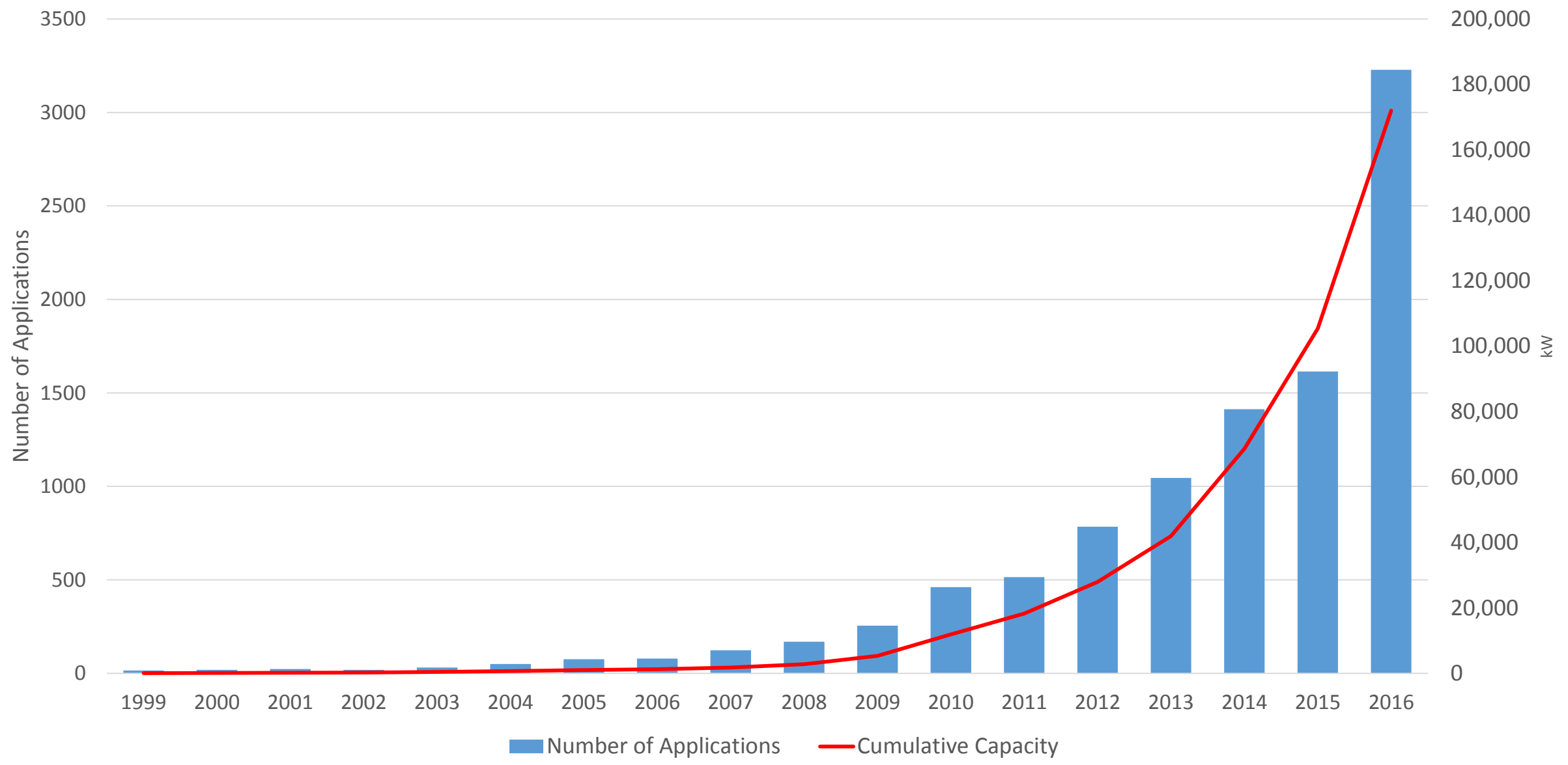
Residential Photovoltaic Solar Example



# Net-Metering 1.0

- Program started in 1997
- Began with small systems and limited program size
- Over time, the law allowed larger systems and increased the program's capacity
- In 2011, customers using solar were offered an incentive payment of ~5 cents per kilowatt-hour (kWh)
  - Monetization of credits began
  - Group systems became common
- In 2014 Act 99 directed Board to start developing "Net-Metering 2.0"
- In 2015 the program filled the statutory 15% capacity cap

# Number of CPG Applications and Cumulative Program Capacity by Year



Number of net-metering permits and capacity approved to date in the service territory of each Vermont distribution utility.

	Solar		Wind		Methane		Hydro		ALL		
Company Name	Count	Capacity (kW)	Count	Capacity (kW)	Count	Capacity (kW)	Count	Capacity (kW)	Total Capacity	PEAK (kW)	% PEAK
Barton	17	91	2	19	0	0	0	0	109.78	3040.00	3.61%
BED	176	6754	4	15	1	248	0	0	7016.64	67000.00	10.47%
Enosburg	30	695	1	2	0	0	0	0	697.12	5740.00	12.14%
CVPS	887	7052	63	344	1	19	4	446	7860.92		
GMP	6273	132220	48	1094	5	405	12	3421	137140.2	766200.00	18.92%
Hardwick	83	1087	10	81	0	0	0	0	1168.43	6930.00	16.86%
Hyde Park	28	331	1	10	0	0	0	0	340.54	2530.00	13.46%
Jacksonville	5	91	3	11	0	0	0	0	101.93	1180.00	8.64%
Johnson	12	701.8	0	0	0	0	0	0	701.8	2800.00	25.00%
Ludlow	3	31	0	0	0	0	0	0	31.20	12400.00	0.25%
Lyndonville	79	1300	2	99	0	0	0	0	1398.15	13480.00	10.37%
Morrisville	52	835	4	38	0	0	0	0	872.90	9170.00	9.52%
Northfield	25	111	0	0	0	0	0	0	111.03	5330.00	2.08%
Orleans	3	21	0	0	0	0	0	0	0.00	3570.00	0.00%
Stowe	62	628	0	0	1	20	0	0	647.64	18680.00	3.47%
Swanton	23	1602	0	0	0	0	0	0	1601.83	10430.00	15.36%
VEC	761	10365	45	332	1	62	0	0	10759.03	83170.00	12.94%
WEC	268	2020	8	70	0	0	0	0	2090.70	16010.00	13.06%
<b>TOTAL</b>	<b>8787</b>	<b>165913.71</b>	<b>191</b>	<b>2113.96</b>	<b>9</b>	<b>753.75</b>	<b>16</b>	<b>3867.65</b>	<b>172670.0</b>	<b>1027660.0</b>	<b>16.7%</b>

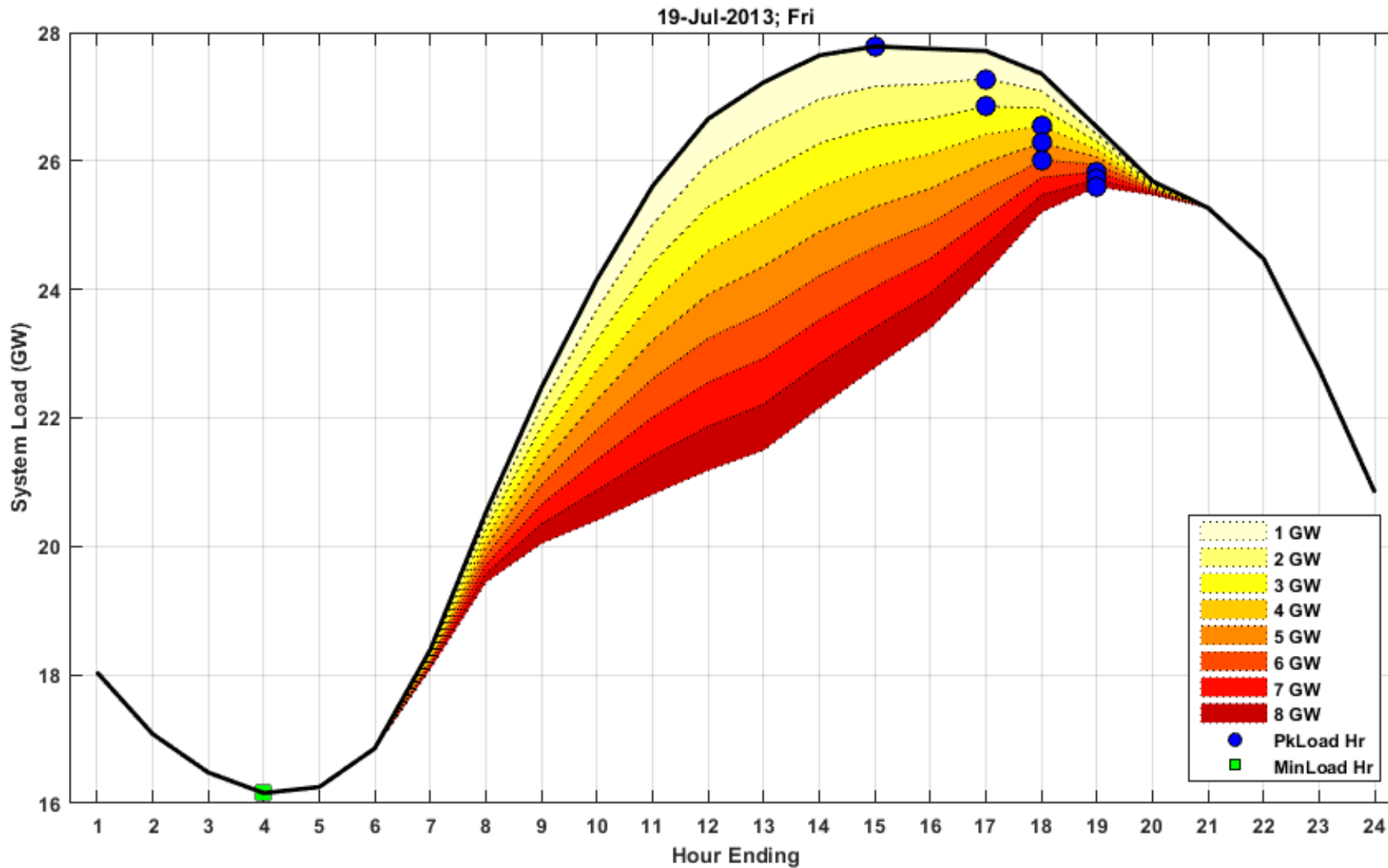
# Recent Developments

- Significant decreases in installation cost of solar
- Development of competitive renewable energy markets in Vermont:

Resource	Price per kWh	Notes
<b>Section 219a Net-Metering</b>	~22 cents	Utility does not receive Renewable Energy Certificate (“REC”)
<b>Large Scale Wind</b>	8.8-11 cents	Includes REC
<b>Energy Efficiency</b>	4.4 cents	Not electricity, no RECs
<b>Standard-Offer Solar 2.2</b>	10-13 cents	Utility receives REC
<b>Other Tier II Solar Resources</b>	~12 cents	Utility receives REC

- Robust build-out of solar in Vermont and New England has changed the value of the benefits offered by building more solar

Increased net-metering will push the time of the peak load to later in the day



# Goals of Net-Metering 2.0

- Mitigate potential rate impacts of net-metering
- Reflect changes in costs of technology
- Promote the beneficial siting of net-metering systems
- Reduce Vermont's greenhouse gas emissions
- Facilitate public participation in the review of net-metering applications
- Foster a sustainable renewable energy industry in Vermont



# Summary of Significant Changes

- Incentive structure
  - Incentives for better siting decisions
  - Incentives to support Vermont's Renewable Energy Standard and reduce greenhouse gas emissions
  - Designed to reflect economies of scale and future changes in the cost of technology
- Rate structure
  - Reduce the cost shift between net-metering customers and customers who don't net-meter
  - Periodic review of incentives to reflect changes in technology and markets
- Application Procedures
  - Designed to encourage better siting decisions
  - Designed to facilitate public participation in Board proceedings

# Structure of the Rule

- Five Parts
  - I. General Provisions
  - II. Application Procedures
  - III. Public Participation
  - IV. Program Requirements (rates, billing, groups)
  - V. Compliance Procedures

# Application Procedures

- Registrations (Section 5.105)
  - Ground mounted solar up to 15 kW
  - Roof mounted solar up to 500 kW
  - Hydro up to 500 kW
- “Application Form” (Section 5.106)
  - Any ground mounted system (solar, wind, biomass, CHP) over 15 kw and up to 50 kW
  - No hydro
- “Petitions” (Section 5.107)
  - Everything over 50 kW, except hydro

# Registration Process

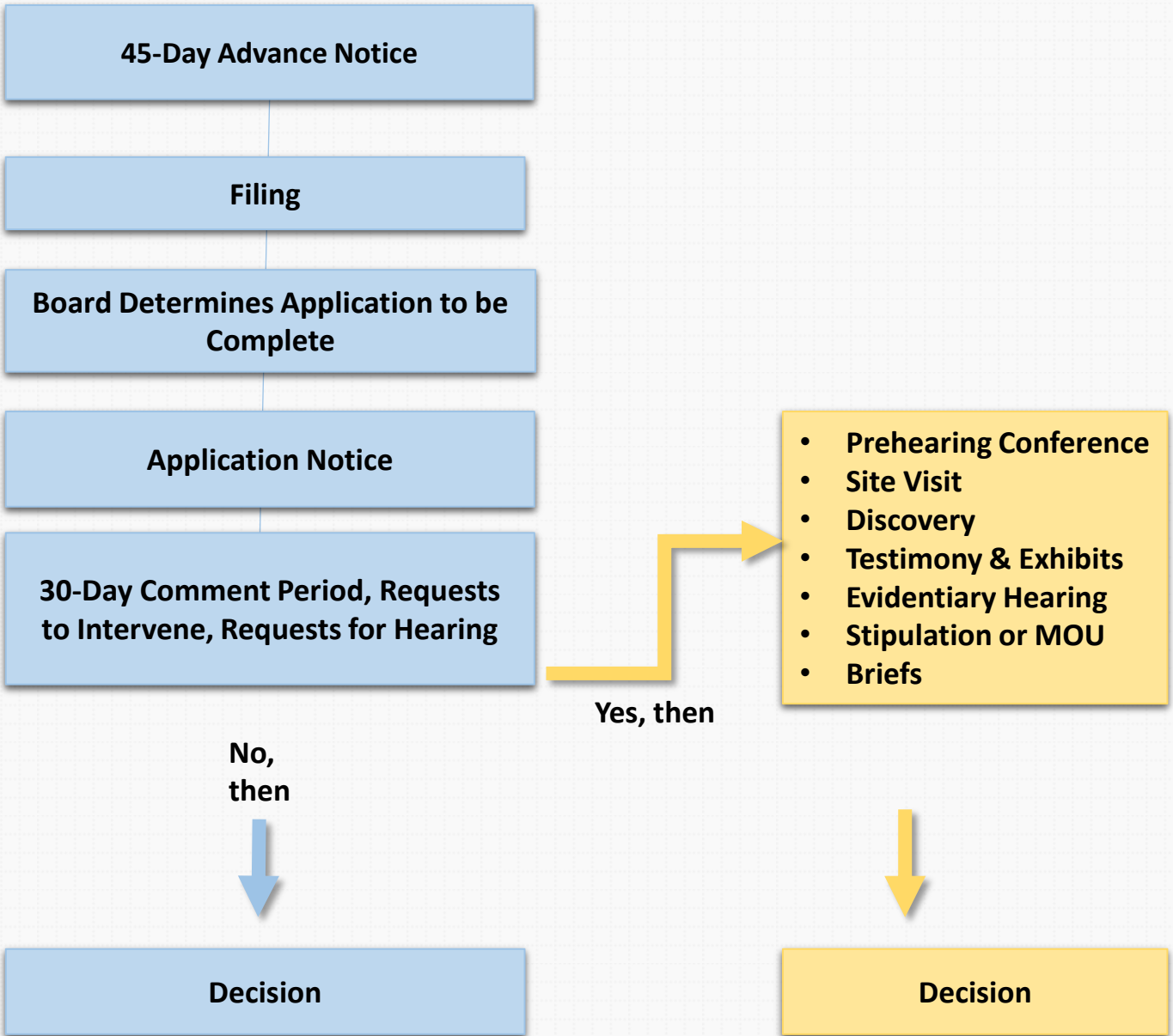
## **Systems up to 15 kW**

- 10 business-day comment period
- DPS, ANR, Utility
- If there is an objection, then no construction until objection resolved
- If no objection, construct on the 11<sup>th</sup> business day

## **Systems greater than 15 kW**

- 30 calendar-day comment period
- DPS, ANR, Utility
- If there is an objection, then no construction until objection resolved
- If no objection, construct on the 31<sup>st</sup> calendar day

# Application and Petition Procedures



# Part III – Public Participation

- Part III is intended to provide guidance to the public about how to participate in the review of net-metering CPG applications

# Pre-Existing Systems

- Pre-existing systems are exempt from certain provisions of the rule:
  - Pre-existing systems continue to receive the Section 219a “Solar Adder” for 10 years
  - Pre-existing systems are not subject to non-bypassable charges for 10 years
  - Pre-existing systems are not subject to REC or siting adjustors
- Pre-existing systems will receive the blended residential rate for excess generation after 10 years

# Rate Structure

- New rate structure can be described as “retail plus” or “retail minus” depending on the system
- To calculate the value of a net-metering credit, start with the “Blended Residential Rate”
  - Company’s general residential service rate,
  - Blend of company’s residential block rates, or
  - Statewide average rate (14.9 cents)



# Siting and REC Adjustors

Siting Adjustor	
Type of Project	Adjustor Value
< 15 kW	1 cent per kWh
15 – 150 kW “well sited”	1 cent per kWh
15-150 kW “greenfield”	(-1) cent per kWh
150 – 500 kW “well sited”	(- 3) cents per kWh
Hydroelectric facilities	0 cents per kWh

REC Adjustor	
Transfer REC to utility	+3 cents per kWh
Customer retains REC	-3 cents per kWh

# Examples of rates available to net-metering systems

All values in cents per kWh.

Type of Net-Metering System	Blended residential rate	Siting adjustor	Positive or negative REC adjustors	Total with either positive or negative REC adjustor
< 15 kW	14.9	1	3 or (-3)	18.9 or 12.9
15 – 150 kW “well sited”	14.9	1	3 or (-3)	18.9 or 12.9
15-150 kW “greenfield”	14.9	(-1)	3 or (-3)	16.9 or 10.9
150 – 500 kW “well sited”	14.9	(-3)	3 or (-3)	14.9 or 8.9

# Non-Bypassable Charges

## Bill Details

Highlighted items are non-bypassable

### E01 Residential Net Metering

Customer Charge: 32 Days @ \$0.433	\$13.86
741 Total KWH Consumed	
106 Total KWH Generated	
635 Total KWH Net Billed @ \$0.1484	\$94.23
0 Total KWH Excess Credit @ \$-0.1484	
Energy Efficiency Charge 635 x \$0.01281	\$8.13
Power Adjustment	\$0.89
Electric Assistance Program Fee	\$1.00
<b>Generation</b>	
192 Total KWH Generation	
192 Solar Incentive KWH @ \$-0.053	-\$10.18
<b>New Charges/Adjustments due by 12/26/16</b>	<b>\$107.93</b>

Total non-bypassable charges for this bill are \$22.99

# Part IV – Compliance Procedures

- Section 5.134 establishes procedures for enforcement of CPG conditions