



# Energy Transformation – The Story

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# Green Mountain Power

## WHO WE ARE TODAY

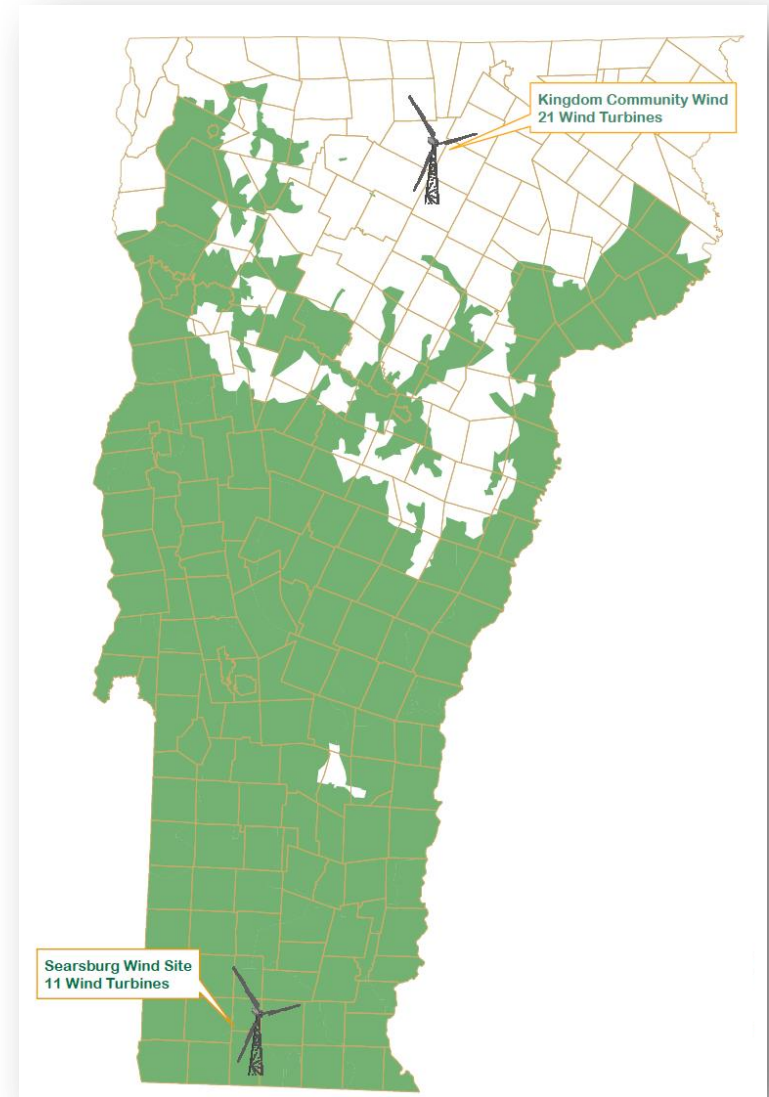
We serve 263,080 customers in 202 towns  
in 7,500 square miles of service territory

We operate

- 32 Hydro Plants
- 6 Peaking Plants
- 12 Solar Projects
- 2 Wind Farms
- 3 100-KW Wind Turbines
- 1 Joint-Owned Biomass Plant (McNeil)

We maintain

- 976 miles of transmission lines
- 11,273 miles of distribution lines
- 185 substations



# LEADING ENERGY TRANSFORMATION WITH CUSTOMERS!

- ▶ Ensuring power is available when needed with a reliable grid and diverse energy portfolio
- ▶ Providing an electric supply that is low carbon, low cost, highly reliable as we transition to a more cost-effective community-based and independent system
- ▶ Empower customers with innovations to reduce carbon, save money, enhance comfort, and increase reliability

## HISTORY – GMP ENERGY VISION - 2008

In 2008, we launched our customer-obsessed vision to fulfill the desire of the Vermonters we serve by delivering low-cost, low-carbon and highly reliable energy.

Our vision - dramatically transform our portfolio:

- ▶ Ramp up cost-effective renewable energy
  - ▶ GMP launched the first solar adder to promote customer adoption of distributed solar technology
  - ▶ Ramp down, but still leverage, large-scale hydro resources as the “green backup system” for more local distributed generation
- ▶ Ramp down dependence on nuclear energy

Our vision was achieved – more diverse portfolio, more renewables, less nuclear, while delivering three bill decreases in four years .

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# ACCOMPLISHMENTS

- ▶ Second lowest rate in N.E.
- ▶ 3 bill decreases and .9% increase for 2017
- ▶ 93% customers satisfaction
- ▶ First B-Corp Utility
- ▶ Over 55% renewable (Tier II)
- ▶ Energy Innovation Center – HUB of transformative products – (Tier III)
- ▶ DOE highlighted GMP innovation in Report





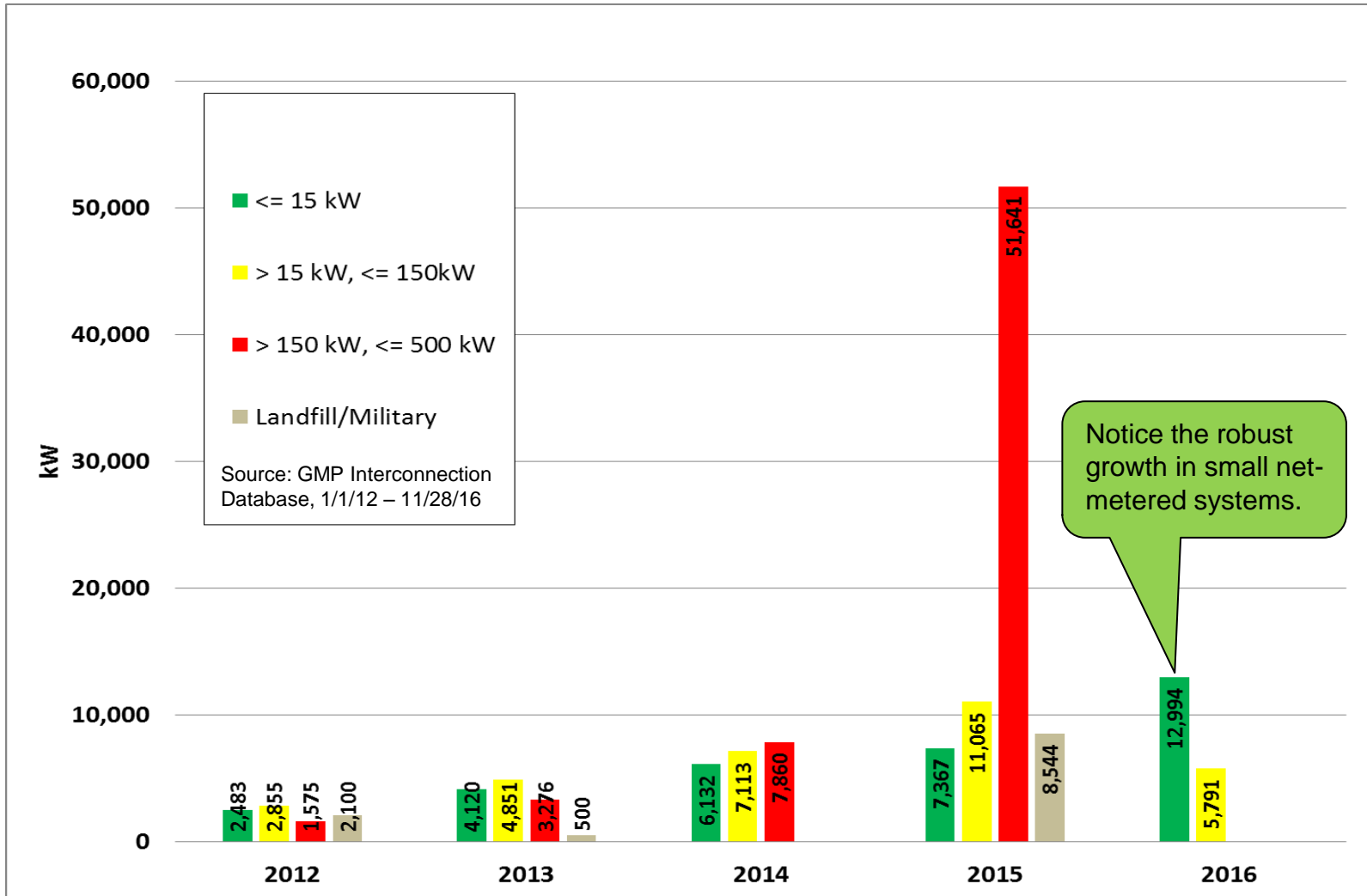
**Renewable Growth in VT Unprecedented!**

# Green Mountain Power

## IN SERVICE & QUEUED – DG PROJECTS 2016 IN KILOWATTS

	GMP	Net Metered	Other	PPA	SPEED	VEPPI 4.1	Grand Total
Batt			1,500				1,500
Bio	800	474	65	90	6,515		7,944
Hydro	4,543	3,248	12,674		4,139	400	25,004
Other			23,261				23,261
PowerWall			53				53
Solar	23,862	142,592		55,383	56,398	5,000	283,235
Wind		1,298			174		1,472
<b>Grand Total</b>	<b>29,205</b>	<b>147,612</b>	<b>37,553</b>	<b>55,473</b>	<b>67,226</b>	<b>5,400</b>	<b>342,647</b>

# ACCEPTED NET METER APPLICATIONS PER YEAR





## ENERGY DELIVERY SYSTEM IS CHANGING:

### *The need for speed and leveraging innovation*

Transforming to a more home, business and community-based energy delivery system. Why?

- ▶ Bulk power system is not economically efficient, or effective in terms of basic climate resiliency.
- ▶ Regional transmission build-out continues to drive up cost of bulk system and drive down economic efficiency.
- ▶ Old way of energy use is inefficient, carbon intense, and expensive.
- ▶ Technologies exist to help lead a transformation as customers and communities are becoming more “energy engaged.”

## TODAY'S GRID

- ▶ 130 YEARS
  - ▶ Length of time since grid was formed, and the underlying model has not changed
- ▶ 60%
  - ▶ The amount of energy lost before it performs its useful work
- ▶ \$70 Billion
  - ▶ Average annual financial impact of outages in the U.S.
- ▶ \$ 40 million
  - ▶ GMP T&D maintenance costs

Transforming our Energy Delivery system is overdue!

## TWIGS AND TWINE!

Expensive to maintain against wild swings in weather due to climate change





## ENERGY VISION 2017 –

### GMP COMMITTED TO . . .

- ▶ **Transform** – Deployment of storage and other distributed renewable technologies to transform the grid and make a leap toward exceeding Vermont’s renewable energy goals , i.e. 90% by 2050
- ▶ **Deliver** - clean, cost-effective and reliable power that increasingly is produced near where it is used, transforming the 100-year-old grid to a distribution grid
- ▶ **Automate** - the grid to increase energy independence and resiliency at the home & business, community and statewide levels, including using smart controls that automatically balance demand with available power
- ▶ **Innovate** - Offering products and services to help customers achieve their energy objectives while bringing in new revenues into the regulated utility to lower costs and mitigate the death spiral

# The First eHome







**Solar Generation**

**LED Lighting**

**Home Automation**

**Weatherization**

**Heat Pump  
Heating & Cooling**

**Heat Pump Hot Water**



# PARTNERING TO MAKE VERMONT AN ENERGY LEADER

**POWERWALL**  
TESLA HOME BATTERY

First utility in America to offer Tesla  
Powerwall - Home Battery Systems.

TESLA



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A large-scale solar farm installation on a grassy hillside. The solar panels are arranged in long, parallel rows that recede into the distance. Two men are walking through the rows in the foreground. The background features a dense forest of trees and rolling hills under a clear blue sky. A small green utility building is visible on the left side of the image.

## Stafford Hill Solar / Storage Project



## The Project

First of its kind to pair solar on capped landfill and battery storage



2.5 MW DC  
Solar PV



2 MW Lithium  
Ion Batteries



2 MW Lead  
Acid Batteries

## The Value

To provide clean energy and increase resiliency in an emergency



Islanding  
Emergency  
Shelter



System  
Reliability  
Benefits



Renewable  
Integration



Reduce  
Transmission  
Cost



Demonstration  
Project  
for DOE

A wide-angle photograph of a solar farm. The foreground and middle ground are filled with rows of dark blue photovoltaic solar panels, each mounted on a concrete base. The panels are arranged in neat, parallel lines that recede into the distance. The ground between the panels is covered in green grass. In the background, there are rolling hills and a line of trees under a bright blue sky filled with large, white, fluffy clouds. A white, rounded rectangular box is superimposed over the center of the image, containing the text "What's Ahead?".

**What's Ahead?**



**GMP: bringing together the best in energy technology.**





# First Utility to Help Customers Go Off-Grid

**Ultimate in energy independence**

**Lowers carbon emissions**

**Combines solar, battery storage & home automation**

**Increases resiliency & lowers costs for customers**



The logo for eVolve Panton is centered on a white rounded rectangle. The word "eVolve" is written in a green, lowercase, sans-serif font, with the "e" being a lighter shade of green. To the right of "eVolve" is a green icon of a leaf with a white line graph inside it, symbolizing growth and technology. Below "eVolve" is the word "Panton" in a smaller, green, lowercase, sans-serif font.

eVolve  
Panton



## What is **eVolve Panton?**

A partnership with Efficiency Vermont & VEIC on a community-wide bundled rapid energy transformation project in Panton VT to dramatically reduce energy costs and carbon for the entire community, homeowners and businesses, lower their use and improve their comfort.

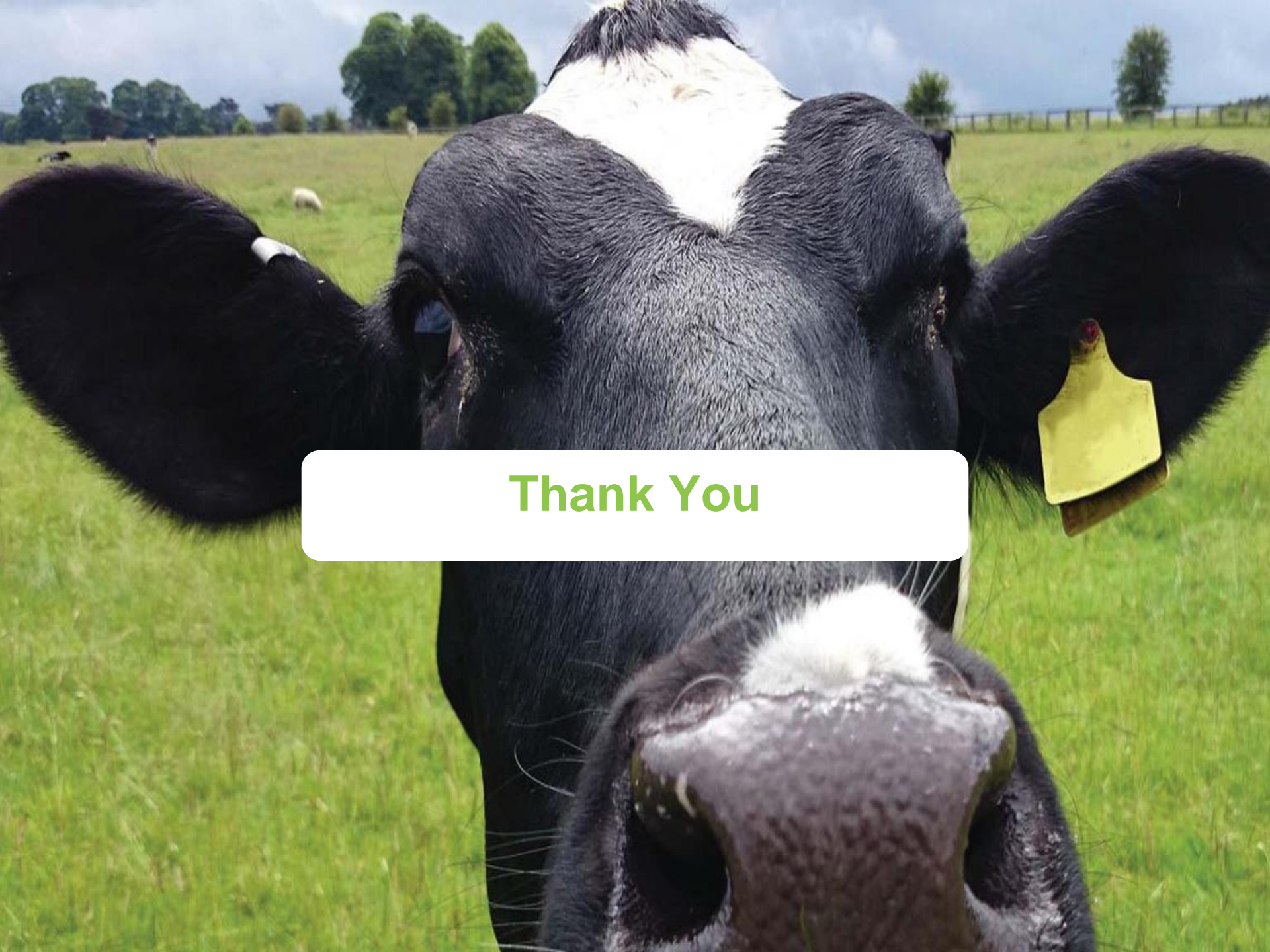
## What will we **achieve in 12 months?**

What would otherwise take 20 years. We will provide energy transformation that will change the business model for how customers think about energy so they can enjoy cleaner, more reliable, and affordable energy – plus a stronger bond forged through their collective action.



# GMP COMMITMENT TO VERMONT'S ENERGY FUTURE:

- ▶ Continue the transformation and keep Vermont a leader in energy independence
- ▶ Invest in cutting edge products and services to help customers save money, use less energy, and be more comfortable
- ▶ Increase reliability & resilience with strategic local DG, storage & microgrids
  - ▶ Lower regional costs / Move toward independence
  - ▶ Achieve dramatically lower regional costs by bringing GMP peak down
  - ▶ Engage directly with partners and communities to accelerate transformation and embrace total energy carbon goals and reduce GHG – Panton serving as the model



**Thank You**





# QUESTIONS