



Vermont Electric Co-op

- Member owned not-for-profit
- Established in 1938 to serve rural and under-served Vermonters
- 75 communities, 8 counties
- 40,567 meters, 14 meters per mile of line
- Governed by 12-member elected Board
- Democratic control: one member, one vote

Vermont Electric Co-op



Live **Safely**

Be Positively **Engaged**

Deliver **Results**

Demonstrate **Integrity**

Strive for **Improvement**

Communicate Openly

Collaborate to Achieve

Show **Appreciation**

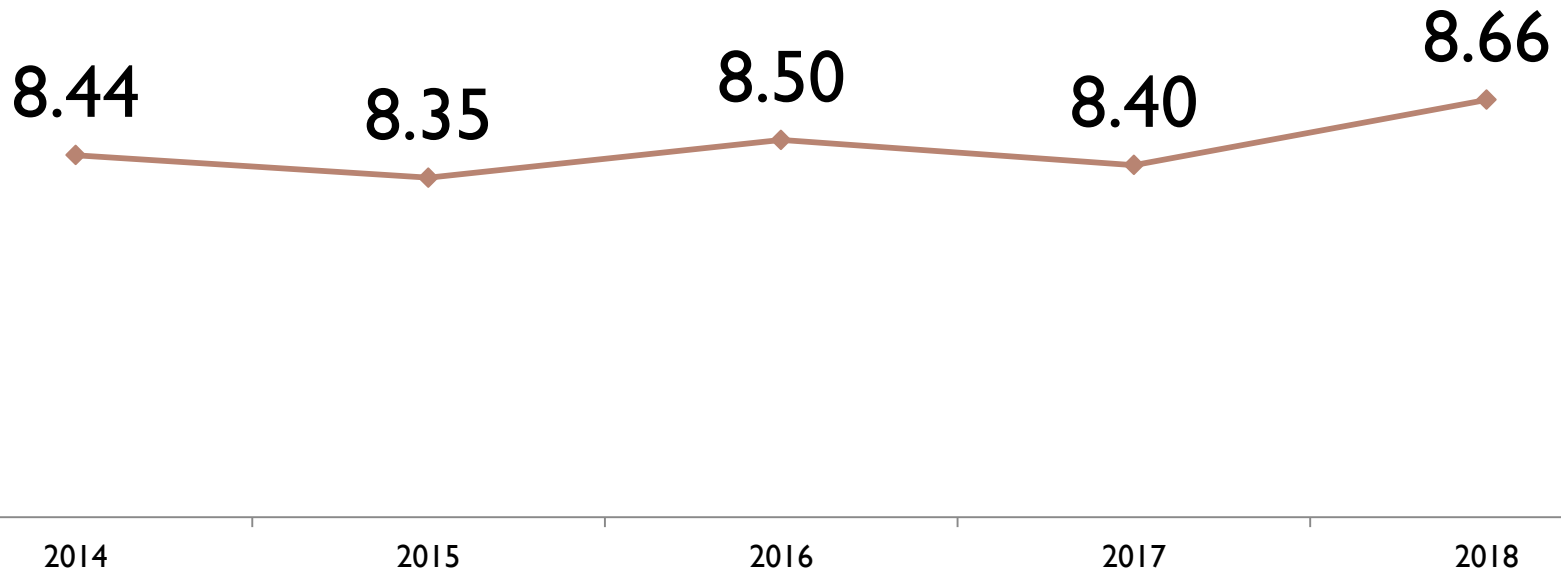
VEC Members

- VEC serves 8 out of 10 Vermont towns, and 3 of top 5 counties, with highest poverty populations
- 40% of residential members on fixed incomes
- 53% percent have been member-owners for 20 years or more
- About half of our electric sales are from commercial/industrial members



VEC Members

Residential Mean Satisfaction Ratings By Year NRECA Market Research Services 10-point scale



Financial Strength

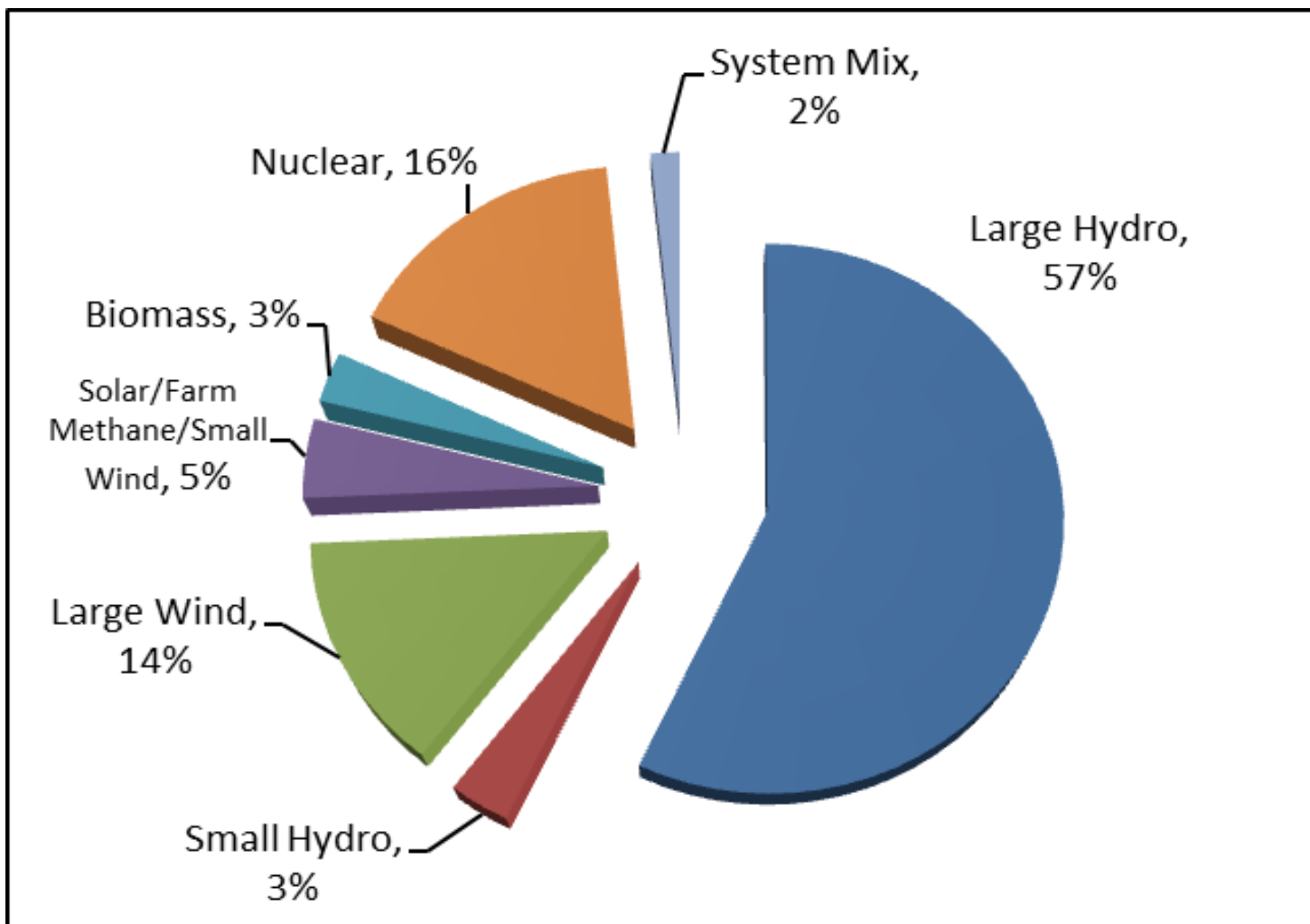
- Rate stability and affordability are VEC priorities
- A+ Rating Standard and Poor's with stable outlook
- No rate increase since 2014
- Average rate increase <1% for past 10 years
- Patronage Capital: The Cooperative Advantage
 - All “earnings” that remain at year end are allocated to members based on how much they paid in electric charges for that year
 - The VEC Board has authorized the distribution of \$4.85 million since 2013

Reliable & Resilient Grid

- **People First**
 - Safety #1, always
 - Invest in great people, training and equipment
- **Invest \$9 million annually in System Upgrades and Maintenance**
 - Enhance reliability. Respond to grid changes – efficiency, growth, net metering. Identify least-cost solutions.
 - Leverage FEMA funding for system hardening (\$635k in 2017)
- **Invest \$3 million annually in Vegetation Management**
- **Leverage Technology**
 - Smart Grid - SCADA enabled real-time info and remote switching
 - Field technology for real-time GIS mapping, outage information
 - Experimenting with drones for remote outage investigation

Environmental Responsibility

Power Supply



Environmental Responsibility

Final 2017 REC Position		
Hydro	240,718	54%
Solar	2,611	1%
NM Solar	782	<1%
Landfill Gas	182	<1%
Nuclear	79,918	18%
System Mix/Oil	119,958	27%
Total Retail Sales	444,169	100%

2017 Energy Attributes

73% Carbon-Free

55% Renewable (VT RES)

Environmental Responsibility



3,483 panels
sponsored by 179
VEC members

Alburgh



Magee Hill



Environmental Responsibility

Net metering continues at rapid pace

	Applicants	kW	Avg kW	% of 2018 Peak
Original projects (pre-4/15/14)	351	3,343	9.5	3.93 %
2014 – 2016 (capped 11/15)	347	6,433	18.5	7.57 %
2017	398	8,167	20.5	9.61 %
2018	382	4,970	13.0	5.85 %
TOTAL	1,478	22,913	15.5	26.96 %

Strategic Electrification

Heat pumps
Electric Vehicles
Pellet Stoves



Clean Air Program (CAP)

Piette & Sons Sawmill



- Brings rural small business onto the grid and off generators
- 48,000 gallons of diesel fuel reduced annually so far
- Benefit all members – leverages infrastructure
- Improves economics for VT business
- Adds load, some in SHEI



Storage & Load Control

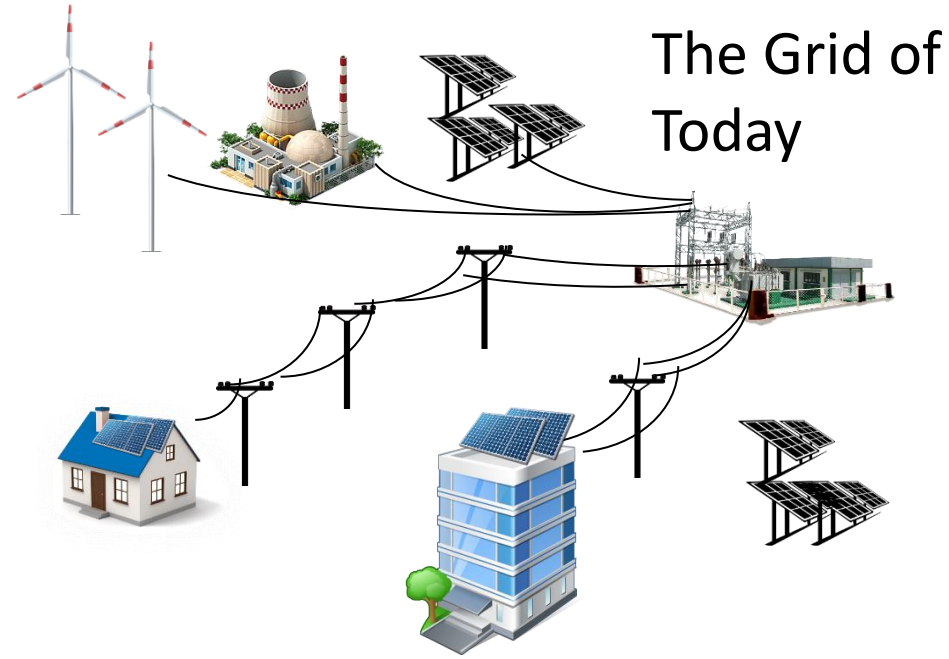
- Utility-scale (1 MW) battery at Hinesburg substation under Energy Storage Service Agreement (PPA for battery)
- Working with new solar installations to partner on battery storage - Jericho
- Pilot program to control electric water heaters
- Exploring residential battery & car charging control platforms
- **Location of storage & timing of control v. peak are critical factors**



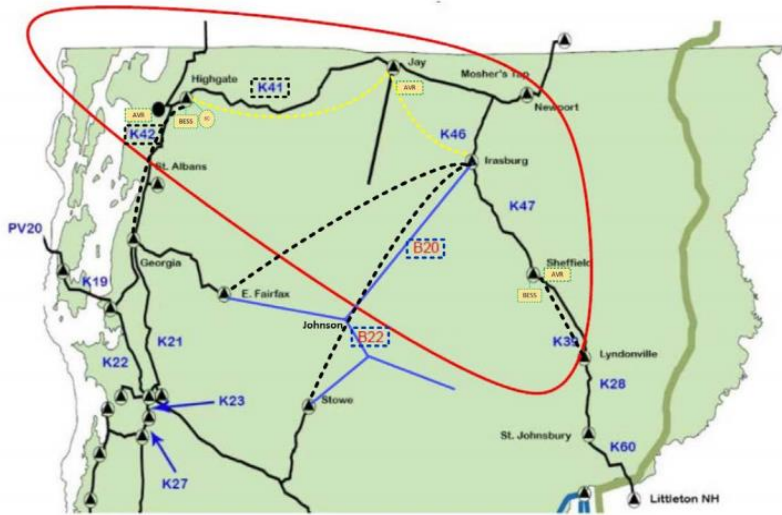
Packetized water heater control device

Challenge: Flat Growth with Increasing Member Expectations

- VEC is experiencing a more dynamic and challenging-to-manage system
- Customer expectations of reliability and service increasing
- Average ~3,000 (6%) new services annually but flat sales
- Policy and regulations continue to evolve
- Tremendous opportunity to transition to cleaner energy technologies and reduce carbon
- New relationships and collaborations will be needed



Challenge – SHEI congestion



- SHEI covers 31 of 41 VEC substations
- Curtailments cost VEC members \$50k per month

- VEC is intervening on all generation projects over 150kW to avoid further harm to its members
- Cost estimates to relieve current curtailments exceed \$10 million
- New generation exacerbates the problem

Looking Ahead

- Explore new ways to provide value to our members
- De-carbonization initiatives
- Expand storage & load control at grid and residential level
- Enhance partnerships to navigate opportunities together
- Strive to be more safe, reliable, cost-effective every day





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