

# Green Mountain Power

An aerial photograph of a large solar farm. The solar panels are arranged in neat, parallel rows across a field. The surrounding landscape is lush with green and autumn-colored trees. In the background, a river winds through the valley, and a small town or village is visible on the right side. The sky is clear and blue.

**S. 267 Act Relating to Renewable Energy Standard**

**February 14, 2020**

**Josh Castonguay**

**Doug Smith**

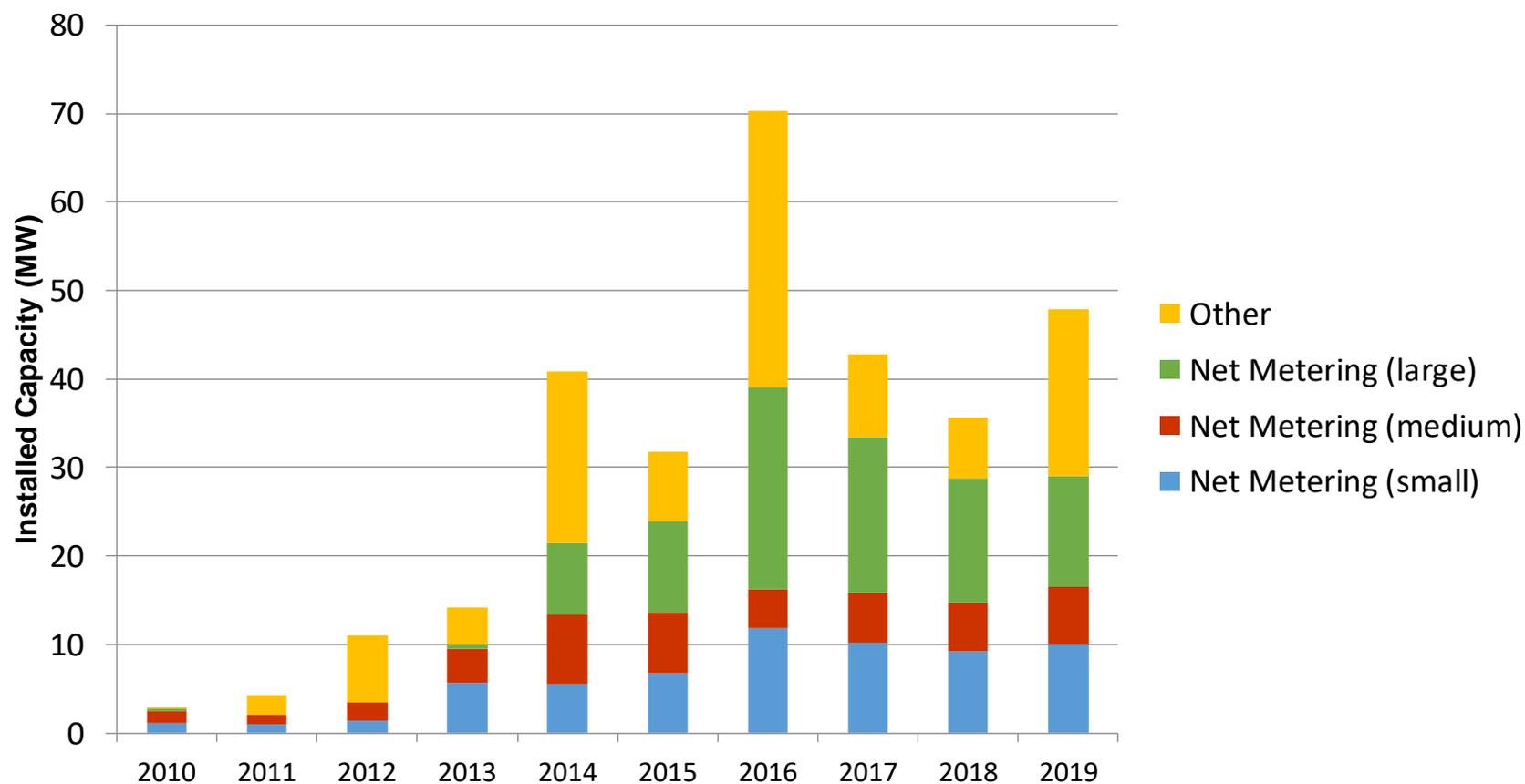
---

# MORE RENEWABLES IN VERMONT – KEY GOALS

- Vermont is a solar leader and will continue to be
- More Tier 2 – GMP supports increasing the requirement to achieve 20%
  - More flexibility in size, location, seasonality choices and cost needed, to fit VT power needs and limit impact for electric customers
- More Tier 1 – GMP has already committed to 100% renewable by 2030; carbon free by 2025
  - Broad eligibility of sources should be maintained

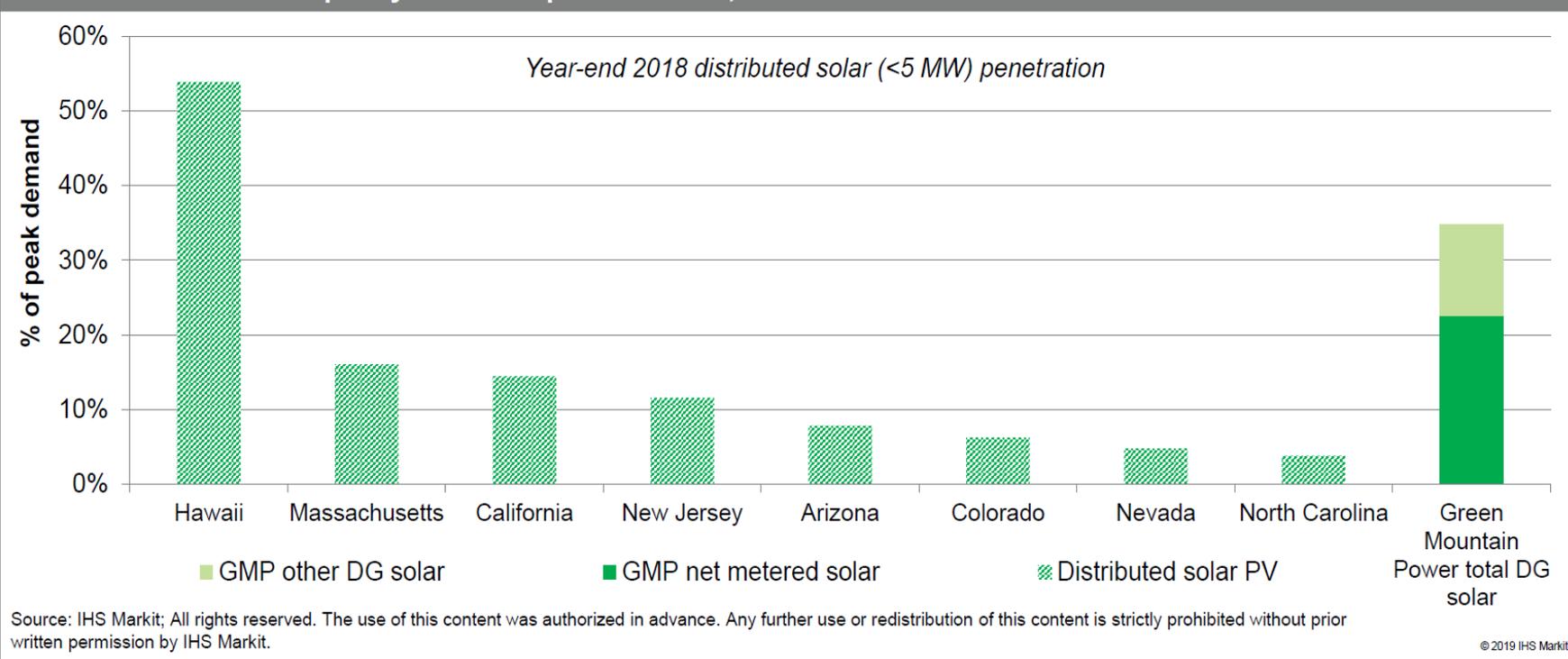
# SOLAR IN VERMONT IS STRONG

## Solar PV Capacity Installed in GMP Territory



# VERMONT IS A NATIONAL LEADER IN DISTRIBUTED SOLAR

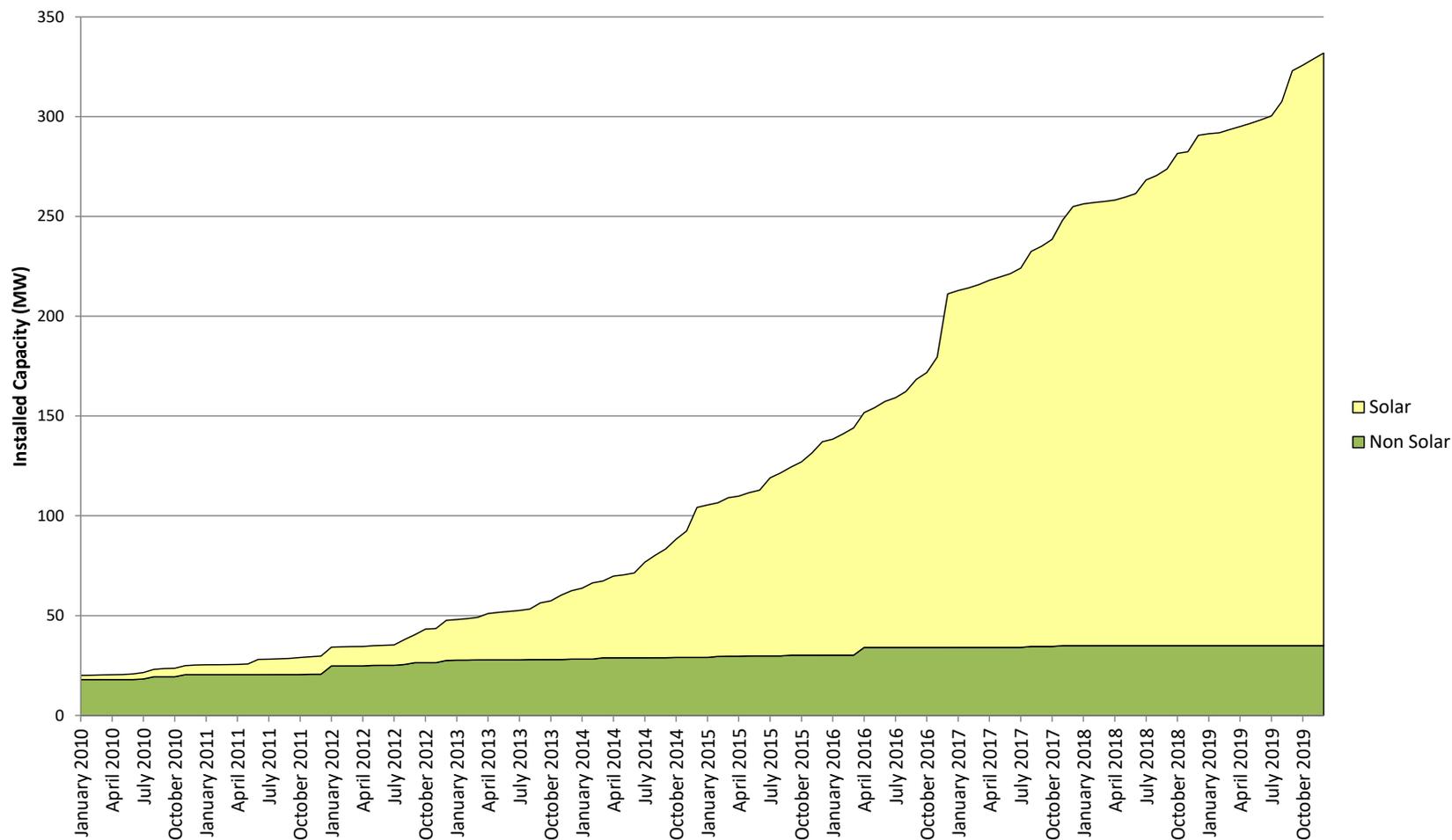
Distributed solar PV capacity as a % of peak demand, 2018



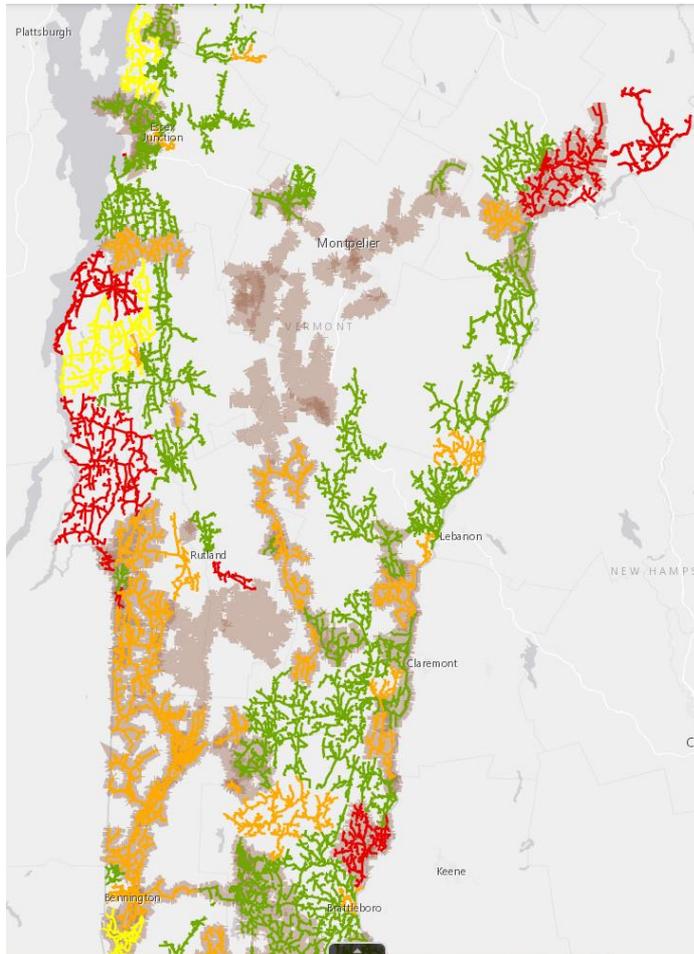
- “Distributed” scale solar means projects sized less than 5 MW.
- At start of 2019 distributed solar capacity was ~35% of GMP peak demand; higher today.
- GMP net metering alone (dark green) exceeds distributed solar % in every state but Hawaii!
- Standard Offer, PPAs, and utility-sponsored projects (lighter green) also contribute.

# GROWTH IN DISTRIBUTED RENEWABLES IN VERMONT MEANS SOLAR

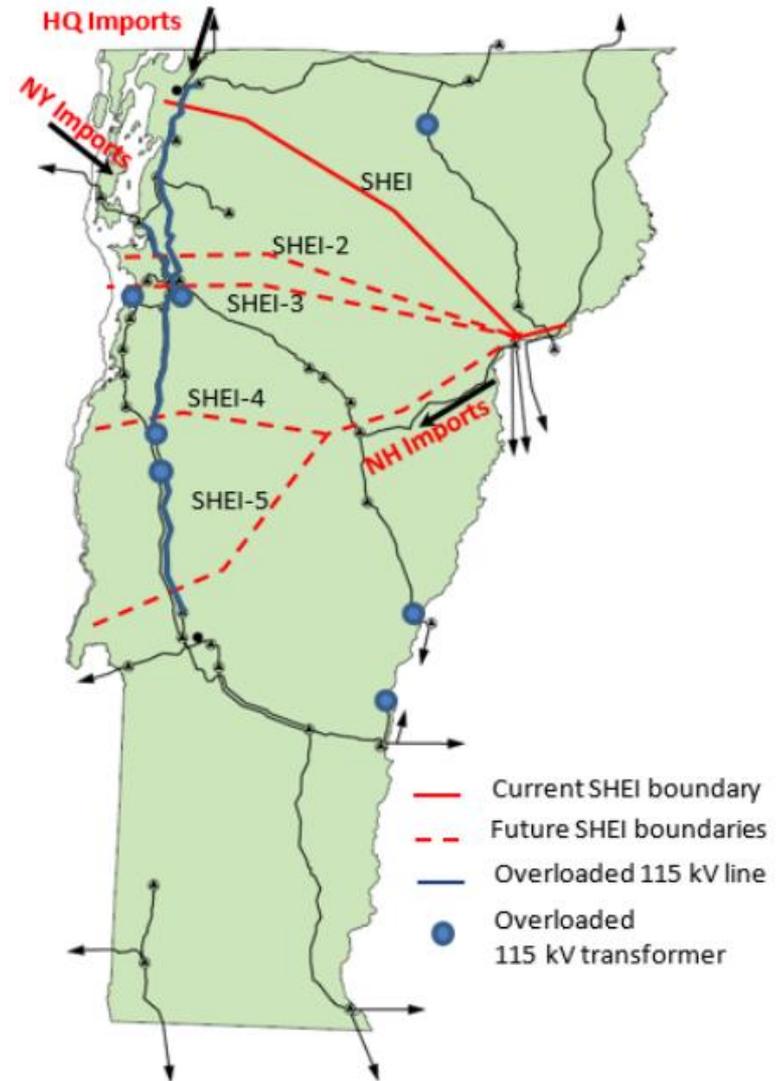
GMP Cumulative Distributed Generation Capacity



# SOLAR BUILDOUT AND GRID UPGRADE COSTS



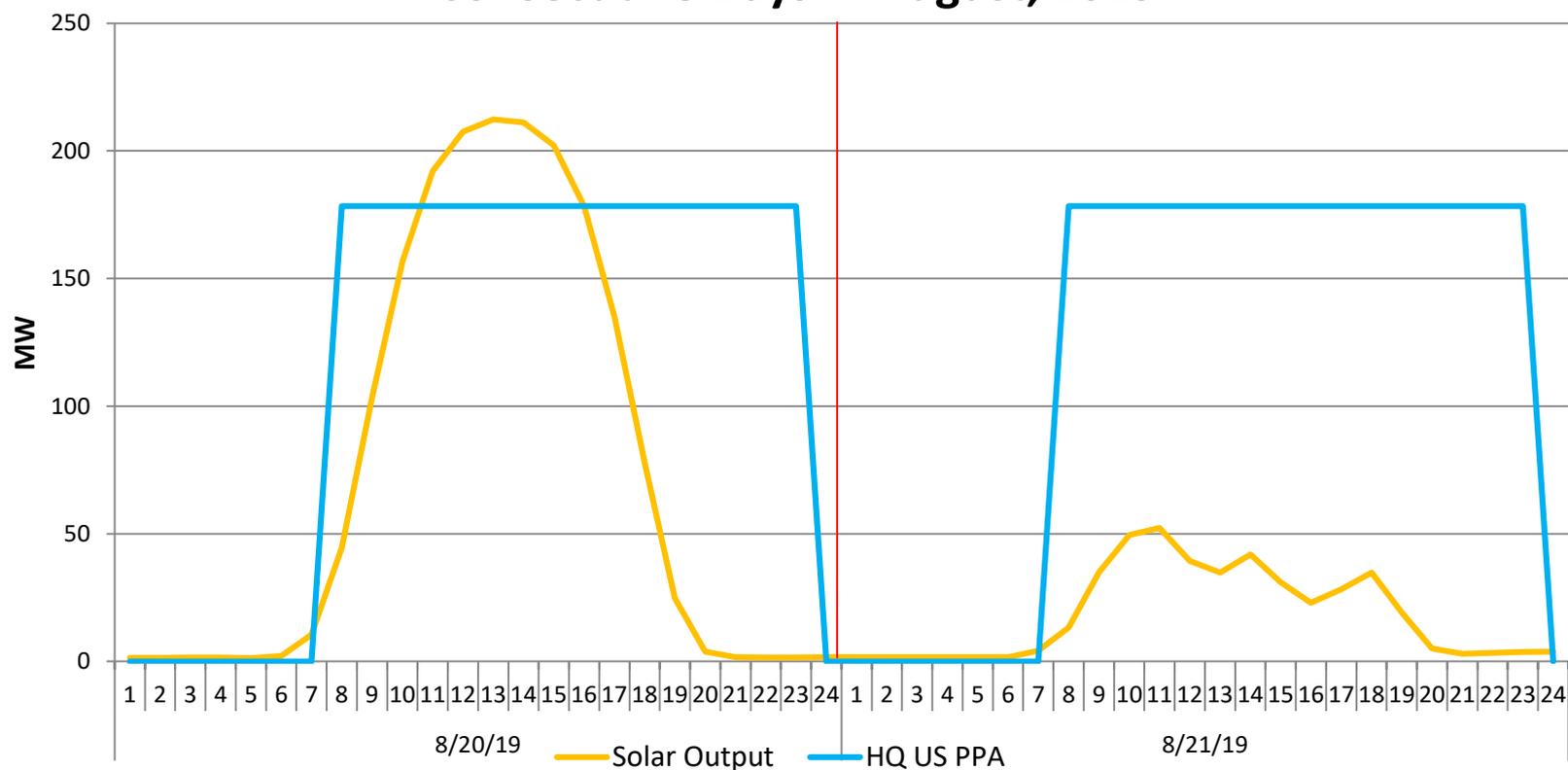
LOCATION OF TRANSMISSION CONSTRAINTS AS A RESULT OF HIGH SOLAR PV



► Source: GMP distribution system solar map (left); VELCO Long Range Transmission Plan 2018 (right)

# SOLAR PV OUTPUT VARIES STRONGLY FROM DAY TO DAY

## Consecutive Days in August, 2019



- Solar PV is collectively the largest power source to GMP – when it is very sunny.
- Solar output (yellow line) can vary extremely on a daily/hourly basis.
- In contrast, firm large hydro deliveries like HQ (blue line) are stable day to day; having both is important.

---

## FLEXIBILITY IN TIER 2 SUPPLY

- Current Tier 2 is essentially an all-solar requirement, as experienced in Vermont.
  - By 2032, estimated additional \$15 million to \$25 million every year for GMP customers if Tier 2 were doubled as is.
- Encouraging flexibility in new renewables is important.
  - Scale economies, lower price per kWh.
  - Limit required grid upgrades.
  - Fit with Vermont power needs.
  - Instate projects still will have the ancillary economic benefits – projects built; jobs; etc.
- Flexibility helps our regional position, too.

---

## FLEXIBILITY IN TIER 1 SUPPLY

- Current broad eligibility of Tier I sources is important, especially as we move to 100%, without caps.
- Large hydro is a major resource for New England clean energy; other states are recognizing that.
- Important not to put VT at a disadvantage.
  - As other states increasingly compete for renewable supplies.
- Large hydro also key to Vermont power needs
  - Complements larger volumes of other intermittent renewables.



# QUESTIONS