

High Level Overview of Regional Concepts

ISO New England – Responsible for administering wholesale electricity markets and conducting transmission planning for the region

Wholesale Electricity Markets

- Energy – balancing load with generation
 - Generators bid to provide energy
 - ISO-NE selects the least-cost units needed to meet load
- Capacity – ensures there are sufficient resources to meet energy needs
 - ISO-NE estimates the peak load for next ten years
 - Forward Capacity Market used to select and set price for capacity
- Ancillary Services (reserves, regulation, etc.) – provides “grid services”

Participation in the Wholesale Markets

- Resources with a nameplate capacity of 5 MW or greater must participate in the markets
- Resources less than 5 MW may choose to participate
 - Resources that do not participate = behind the meter
 - Effectively reduce energy and capacity requirements
 - Resources that only participate in energy market = settlement only resources
 - Vermont net metering and standard offer projects are behind the meter

Transmission Costs

- Pool Transmission Facilities – projects that provide regional reliability
 - Paid for through Regional Network Service
 - Costs are socialized among New England ratepayers
 - Vermont = 4% of New England peak load
- Local Facilities – projects that provide benefit largely to Vermont
 - Costs are allocated among Vermont distribution utilities
- Regional network Service
 - Costs allocated based on each state’s peak load/New England peak load for each month

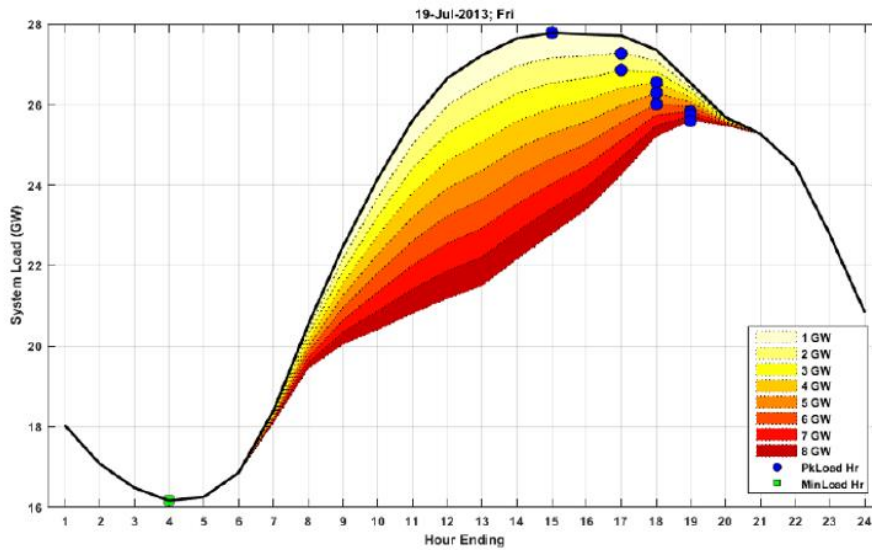
Solar and Peak Load

(consideration for capacity and transmission costs)

- As amount of solar increases, its effect on peak load declines, because peak shifts to later hour
- Solar contributes to reduction in peak load, up to the point that the peak hour occurs after dusk

Solar DG Impact on Timing of Peak Load

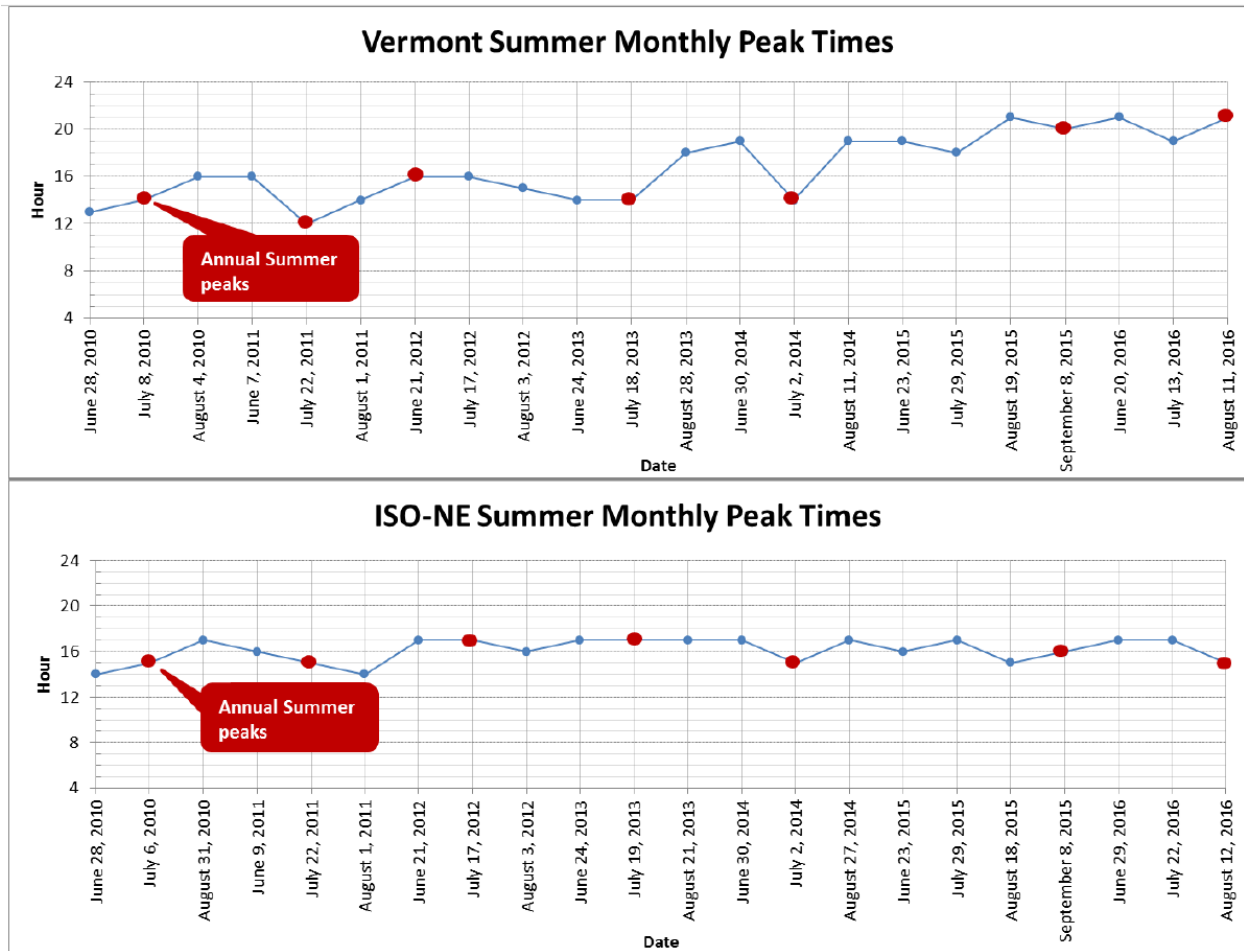
Friday, July 19, 2013



Source: https://www.iso-ne.com/static-assets/documents/2016/06/a8_isonet_loads_with_increasing_behind_the_meter_pv.pdf

Vermont Peak Compared to New England Peak (consideration for transmission costs)

- Vermont has higher percentage of solar than any other state in New England
- Regional peak hour is typically in summer
 - Vermont summer peak is approximately the same as winter peak
 - Some Vermont utilities have a higher peak in the winter
- Peak hour had typically been approximately 4:00 pm; going forward it is more likely to be 8:00 pm
- New England peak hour continues to be approximately 4:00 pm.



Source: VELCO

Impacts on Net Metering

- Value of resource compared to alternative (purchasing from the wholesale markets)
- The declining contribution of solar to peak has two implications for costs
 - Capacity – relative value of each MW of solar declines as the amount of solar increases
 - Transmission costs – once peak hour occurs after dusk, solar does not reduce transmission costs
- PSB proposed Net Metering Rule contains biennial update of adders and can reflect changing value of resources
- Cost-effective storage has the potential to significantly change the value of solar