

New Hampshire Lost Base Revenue Working Group

February 28, 2018

Potential Methods for Estimating Demand Charge Component of LBR

- Analysis of customer-specific kW savings and impacts on demand charges
- Summer kW – demand savings based on ISO-NE summer peak period
- “Combined” kWh and kW – method being used in 2018, using an average distribution rate that combines energy and demand components
- Connected Load kW – demand savings based on measures’ rated kW
- Other methods?

Energy Efficiency Affects Demand Charges in Complex Ways

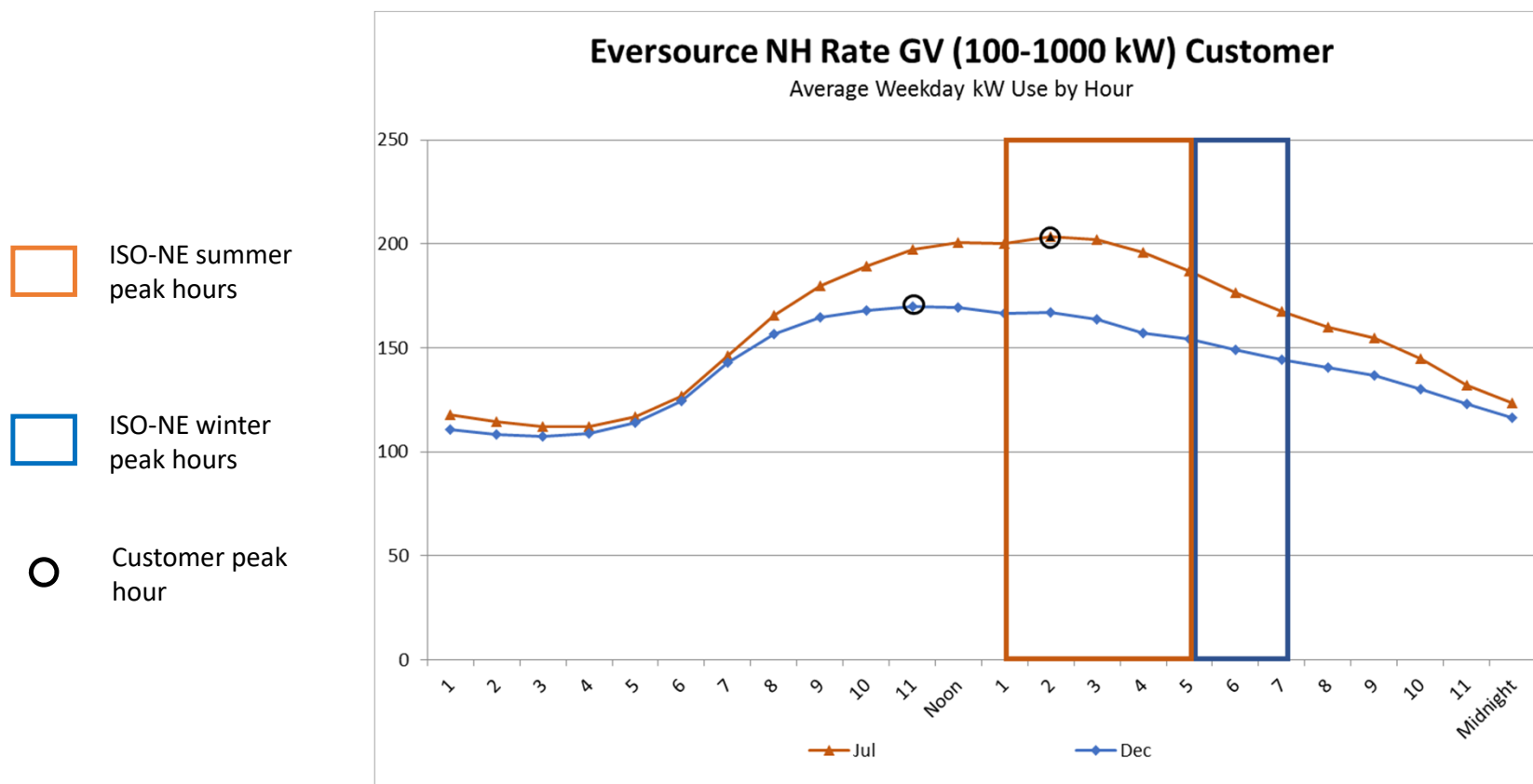
- Analysis of customer-specific kW savings and impacts on demand charges is not economically feasible due to the level of complexity.
- Complexity is created by different rate structures, ratchet charges, customer-specific and measure-specific use patterns
- Optimal Energy, January 23 2018 memo on LBR: “The most accurate way to address the issues noted above would be to assess the effect of reduced consumption on each customer’s individual bill from marginal changes in energy and demand, **but this is clearly far too onerous even if it may be technically possible.**”

Different Peak Definitions: Summer Peak vs. Customer Peak

- ISO-NE summer peak vs. customer peak: kW savings during ISO-NE peak will generally be *smaller* than customer peak kW savings
 - ISO-NE summer peak period: nonholiday weekdays, 1:00 p.m. to 5:00 p.m., during June, July, and August. Used for Forward Capacity Market resources.
 - Customer peak: the customer's highest 30-minute period of demand in a given month.¹ Used to determine actual demand charges.

¹Eversource rates GV and LG. Additional factors are applied in some cases, e.g., ratchet charge for rate LG, adjustments for peaks between 8:00 PM – 7:00 AM, etc. See https://www.eversource.com/content/docs/default-source/rates-tariffs/electric-delivery-service-tariff-nh.pdf?sfvrsn=7fb7f062_22

Peak definitions: ISO-NE vs. Customer Peak

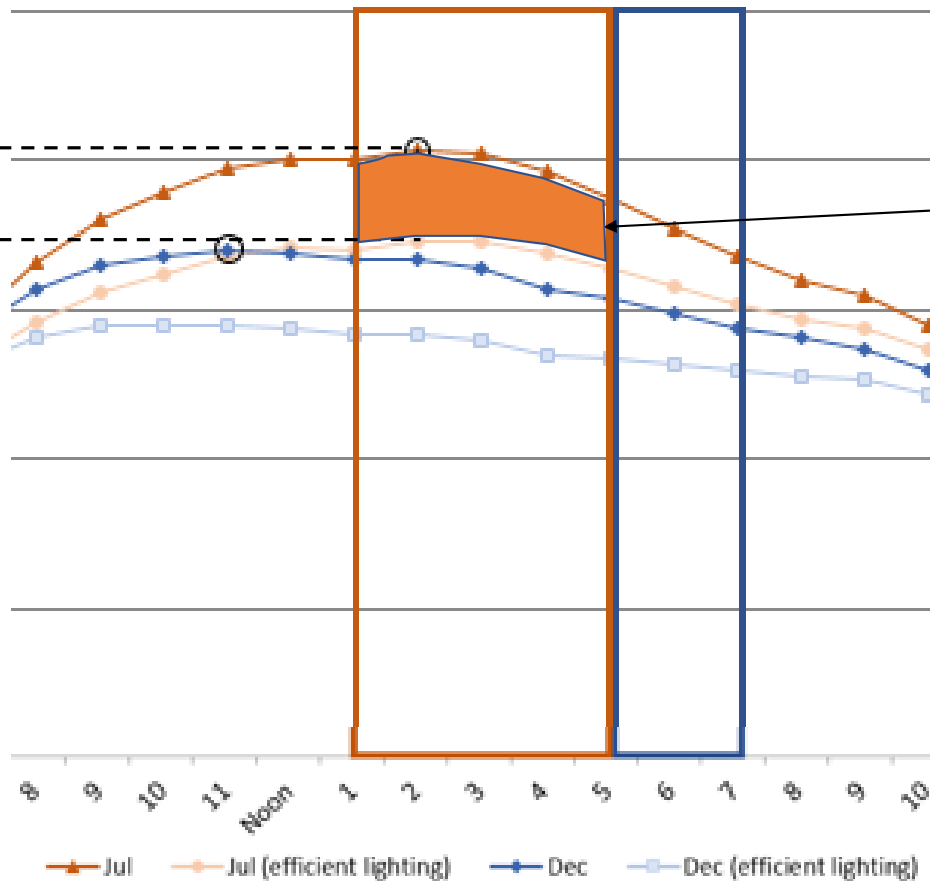


Source: Eversource New Hampshire C&I load shapes, from <https://www.eversource.com/content/nh/about/about-us/doing-business-with-us/energy-supplier-information/electric---new-hampshire>

Peak definitions: ISO-NE vs. Customer Peak, *indoor lighting, summer peak*

Customer peak reduction (determines demand charge)

ISO-NE summer peak coincident kW reduction (average reduction over this period)

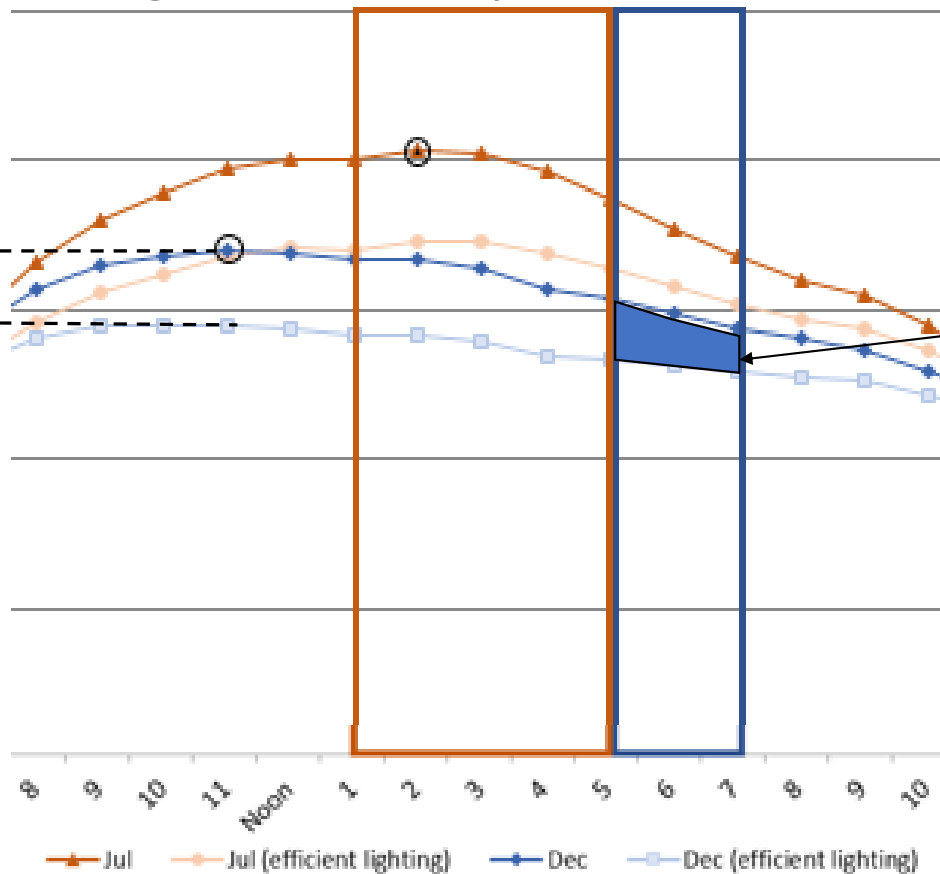


Source: Indoor lighting savings based on lighting load shapes from <http://loadshape.epri.com/enduse>, average weekday, peak & off-peak for NPCC/NE region.

Peak definitions: ISO-NE vs. Customer Peak, *indoor lighting, winter peak*

Customer peak reduction (determines demand charge)

ISO-NE winter peak coincident kW reduction (average reduction over this period)



Source: Indoor lighting savings based on lighting load shapes from <http://loadshape.epri.com/enduse>, average weekday, peak & off-peak for NPCC/NE region.

Simplifying Assumptions: kW vs. kWh

- The “combined” calculation used in 2018 assumes that efficiency measures result in kWh and kW being lost in the same proportions.
 - **customer kWh savings/customer kWh consumption =
customer peak kW reduction/customer peak kW demand**
- Is this a reasonable assumption?

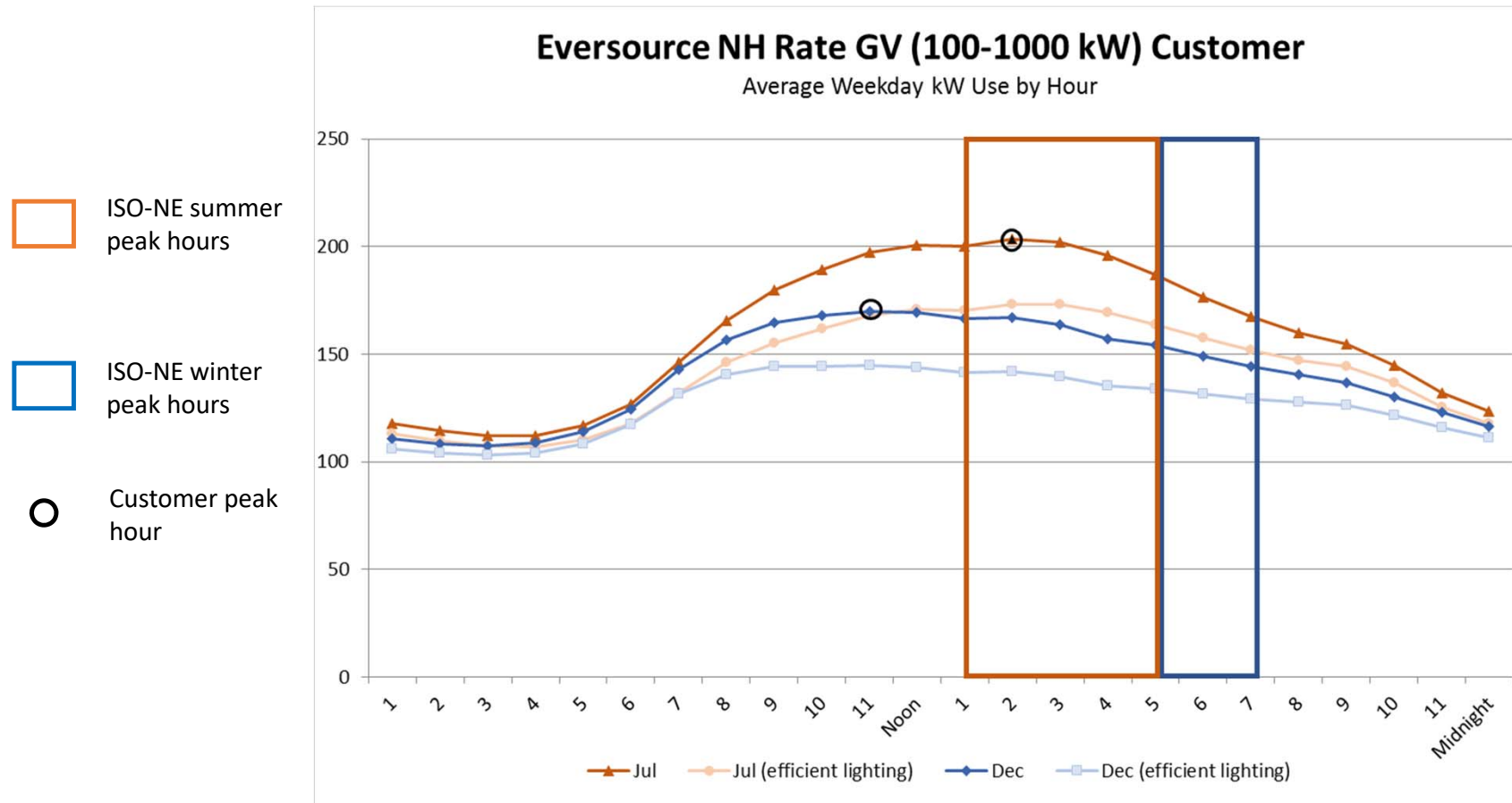
Simplifying Assumptions: kW vs. kWh

- kW vs. kWh—the more a measure's use aligns with peak periods, the greater the kW impact will be relative to the kWh impact
 - Indoor lighting
 - Outdoor lighting
 - Cooling
 - Heating
 - Refrigeration

Source: End use load shapes from <http://loadshape.epri.com/enduse>, average weekday, peak & off-peak for NPCC/NE region.

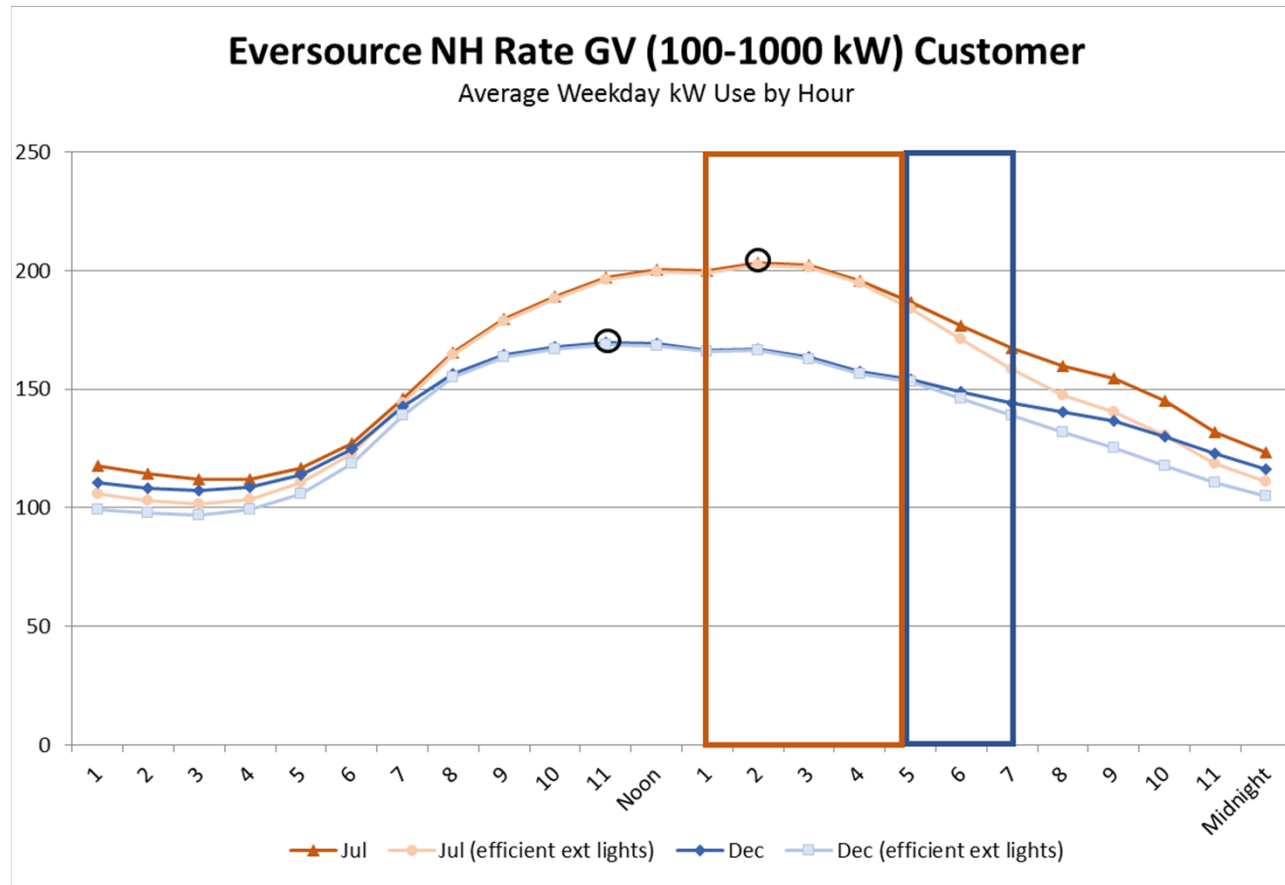
Indoor lighting: kW savings > kWh savings

Avg July weekday kW reduction in peak hour	30.1 kW	15%
Avg July weekday kWh reduction	395.6 kWh	10%
Avg Dec weekday kW reduction in peak hour	24.9 kW	15%
Avg Dec weekday kWh reduction	344.3 kWh	10%



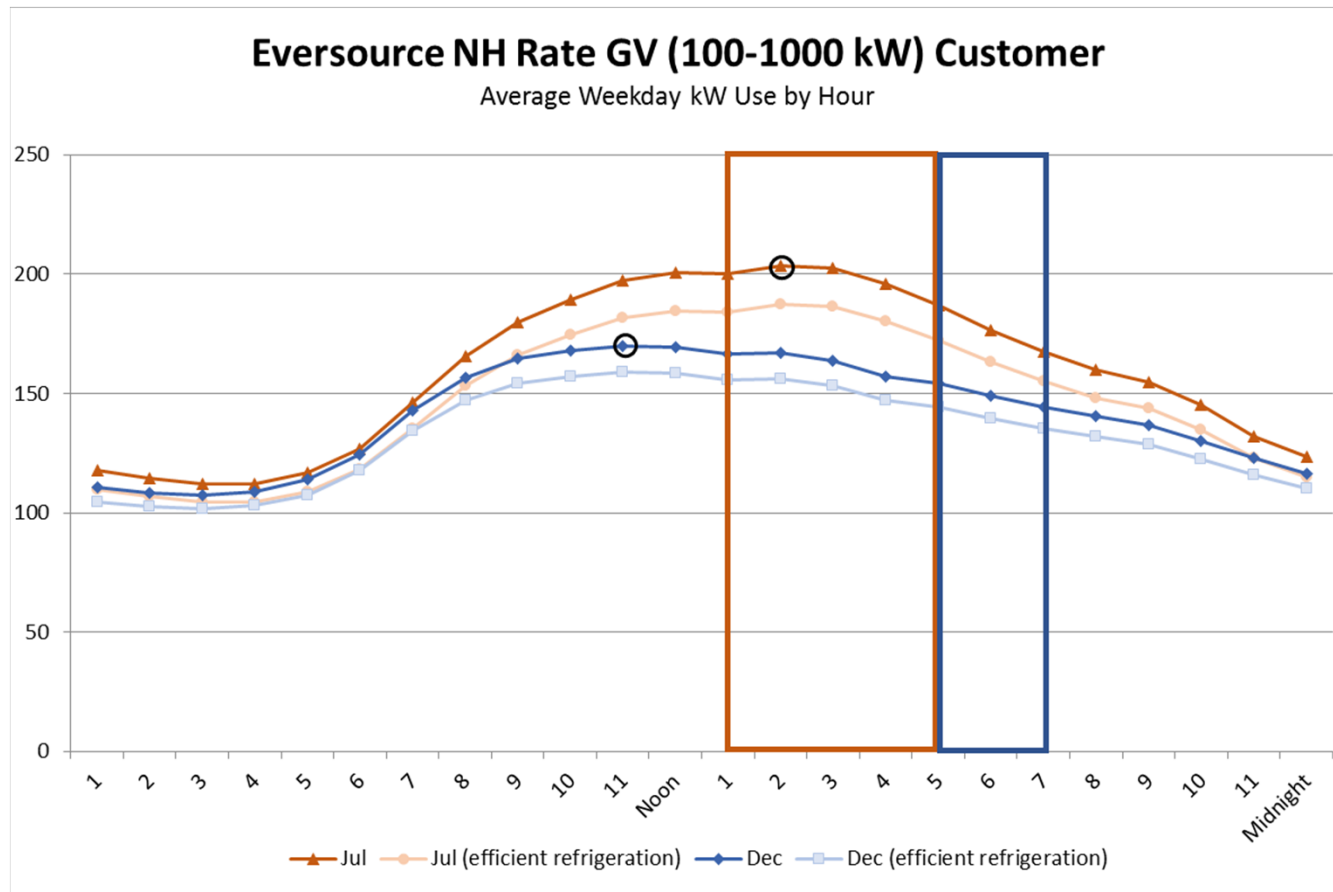
Outdoor lighting: kW savings < kWh savings

Avg July weekday kW reduction in peak hour	1.0 kW	0%
Avg July weekday kWh reduction	146.6 kWh	4%
Avg Dec weekday kW reduction in peak hour	1.0 kW	1%
Avg Dec weekday kWh reduction	133.2 kWh	4%



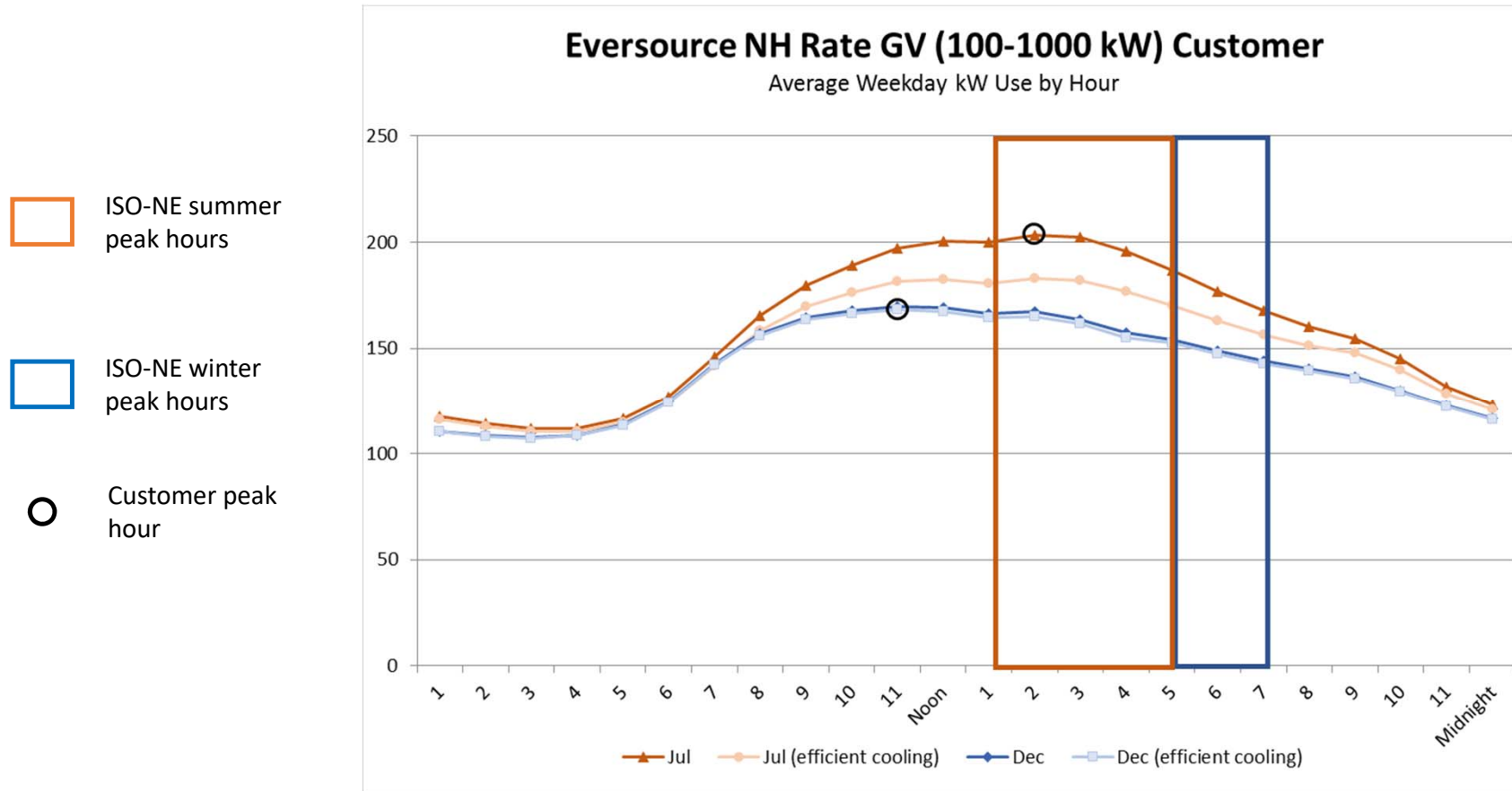
Refrigeration: kW savings \approx kWh savings

Avg July weekday kW reduction in peak hour	16.2 kW	8%
Avg July weekday kWh reduction	284.9 kWh	7%
Avg Dec weekday kW reduction in peak hour	10.9 kW	6%
Avg Dec weekday kWh reduction	204.9 kWh	6%



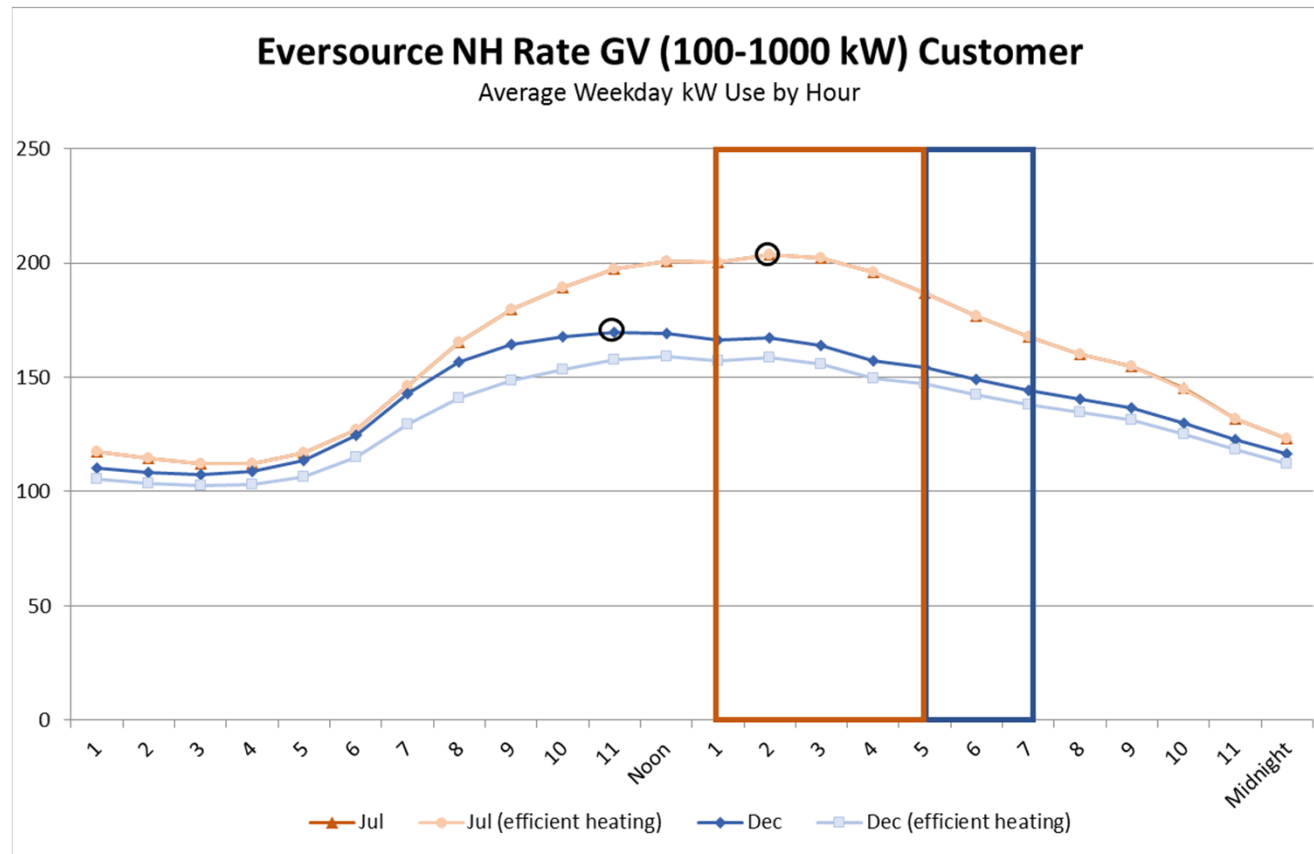
Cooling: kW savings > kWh savings

Avg July weekday kW reduction in peak hour	20.6 kW	10%
Avg July weekday kWh reduction	226.6 kWh	6%
Avg Dec weekday kW reduction in peak hour	1.5 kW	1%
Avg Dec weekday kWh reduction	25.3 kWh	1%

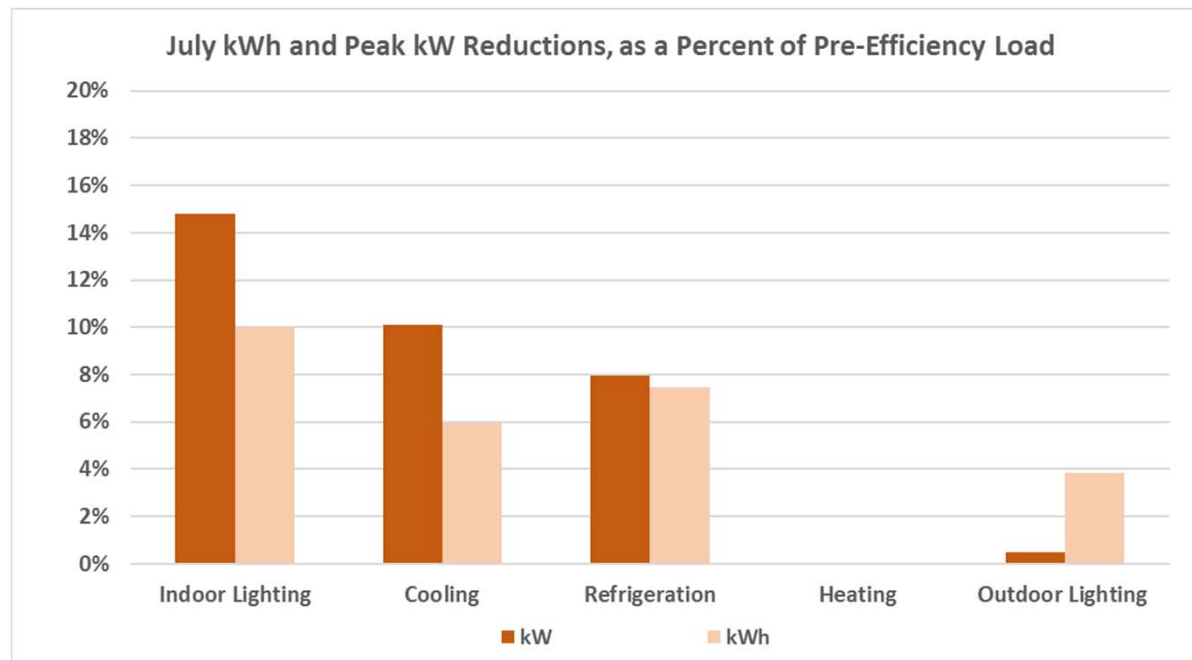


Heating: kW savings \approx kWh savings

Avg July weekday kW reduction in peak hour	0.0 kW	0%
Avg July weekday kWh reduction	0.7 kWh	0%
Avg Dec weekday kW reduction in peak hour	10.9 kW	6%
Avg Dec weekday kWh reduction	197.3 kWh	6%

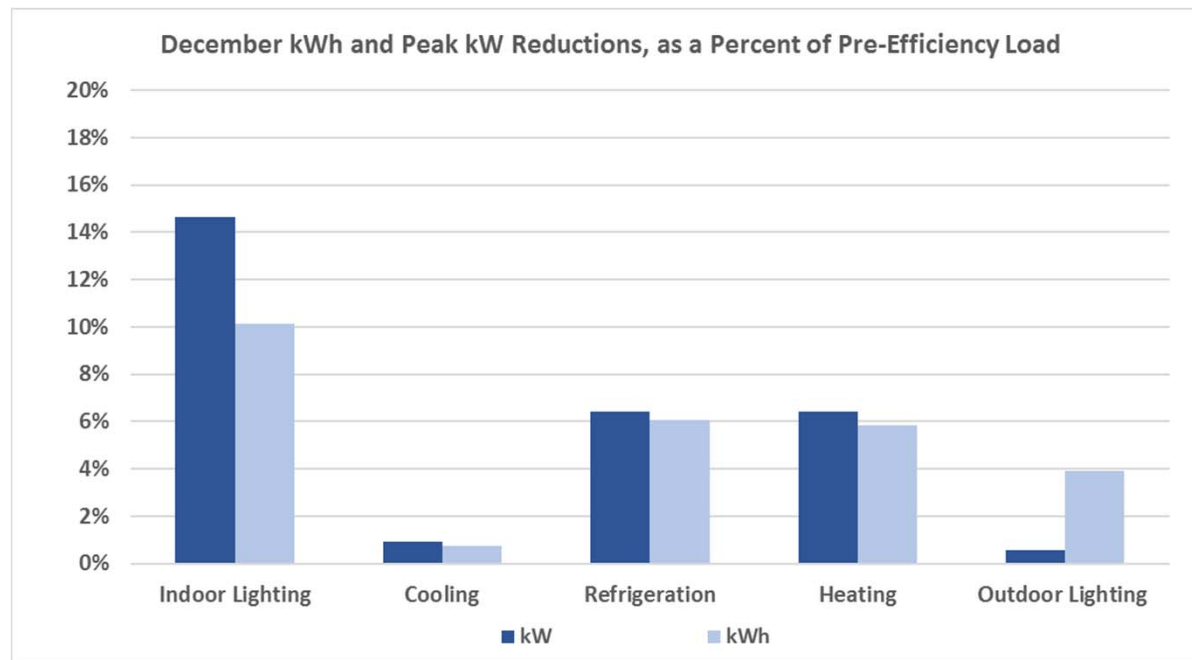


Impact of Efficiency Measures on kW vs. kWh



Note: Based on average weekday load.

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