Department of Public Service
Proposed Next Steps

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Outline

- Proposal to create subgroups to address specific issues
- Preliminary review of relevant EVT data
- Slightly deeper dive on load management issues

Potential Subgroups

Load Management

- Focus areas
  - Cost and value
  - Consumer behavior
  - Rate Design
  - Manual/automatic load control
  - C&I experience

Storage

- Focus areas
  - Cost and value
  - Regulation
  - Practical experience

Curtailment

- Focus areas
  - Cost and value
  - Compliance
  - Regulation
  - Implementation

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Load management

- Shifting load to match solar production
- Suggested initial focus on Electric Vehicles
  - Likely to be the most widespread new flexible load
  - Less seasonality than heat pumps, and not as customer-specific as C&I flexible load
- Behavioral/infrastructure changes necessary to align EV charging with solar output?
- Understanding the societal benefit to electric customers

Curtailment

- Allowing more overall generation by requiring curtailment of some generators during certain peak production hours
- Number of policy considerations
  - Do states have legal authority to curtail generation?
  - Who is responsible for curtailing generation and what is the decisionmaking framework?
    - Identification of which generators are curtailed, how many kW, how many hours.
  - Economics: cost of implementing, economic viability for generators

Storage

- Using storage to shift excess production
- Economic:
  - Review alternative value streams (e.g., reducing peak vs. shifting time of production; shifting production + enhanced reliability in specified area)
  - Per kWh cost of shifting production

Subgroup composition

- Subgroups will require various skill sets:
  - Costs and value (all subgroups)
  - Experience with relevant technologies (all subgroups)
  - Legal/regulatory (all subgroups, particularly curtailment)
  - Consumer behavior (load management)
  - Rate design (load management)
- Need active involvement from a number of stakeholders

Preliminary Review of Relevant EV Data

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ISO-NE EV Forecast

- Used Energy Information Administration 2019 Annual Energy Outlook estimate for New England EVs
  - Assumed distribution among states based on 2018 EV registrations in each state
- Monthly energy data from Chargepoint
- Available at: https://www.iso-ne.com/static-assets/documents/2020/02/final-draft-2020-transpelectr.pdf

ISO-NE Forecast: # of EVs

Year	NE	CT	MA	ME	NH	RI	VT
2020	35,653	8,449	18,329	2,181	2,672	1,499	2,523
2021	43,199	10,237	22,209	2,642	3,238	1,816	3,057
2022	47,020	11,143	24,173	2,876	3,524	1,976	3,327
2023	49,783	11,798	25,594	3,045	3,731	2,092	3,523
2024	53,005	12,561	27,250	3,242	3,973	2,228	3,751
2025	55,737	13,209	28,655	3,409	4,177	2,343	3,944
2026	55,921	13,252	28,750	3,420	4,191	2,351	3,957
2027	57,136	13,540	29,374	3,495	4,282	2,402	4,043
2028	58,032	13,753	29,835	3,549	4,349	2,439	4,107
2029	60,197	14,266	30,948	3,682	4,512	2,530	4,260
Estimated Total	**515,683**	**122,208**	**265,119**	**31,540**	**38,649**	**21,675**	**36,492**

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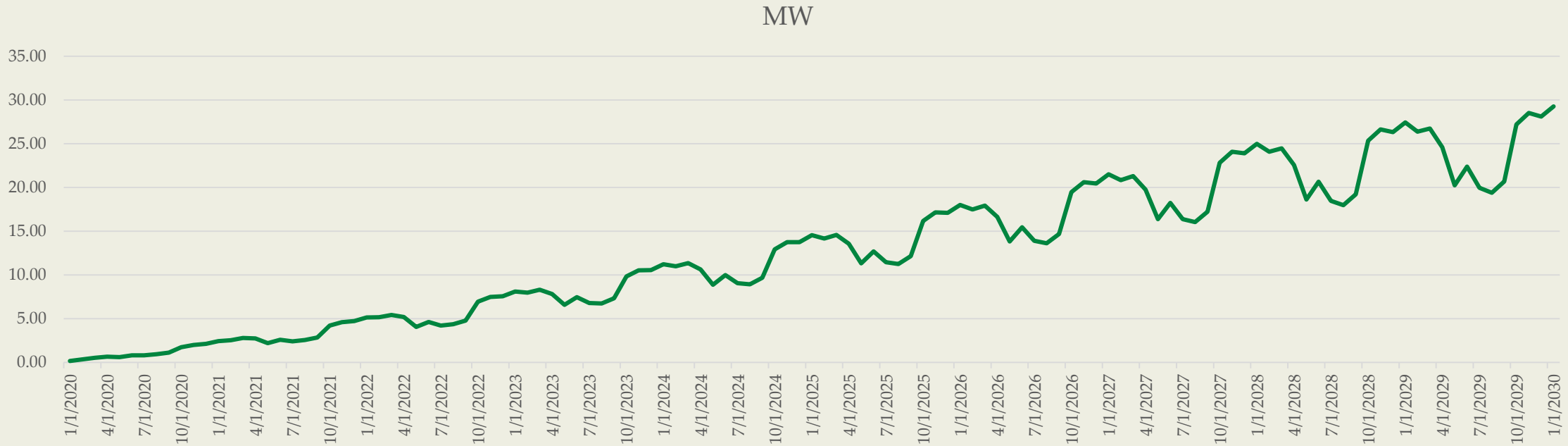
ISO-NE EV Forecast Monthly Demand for Vermont



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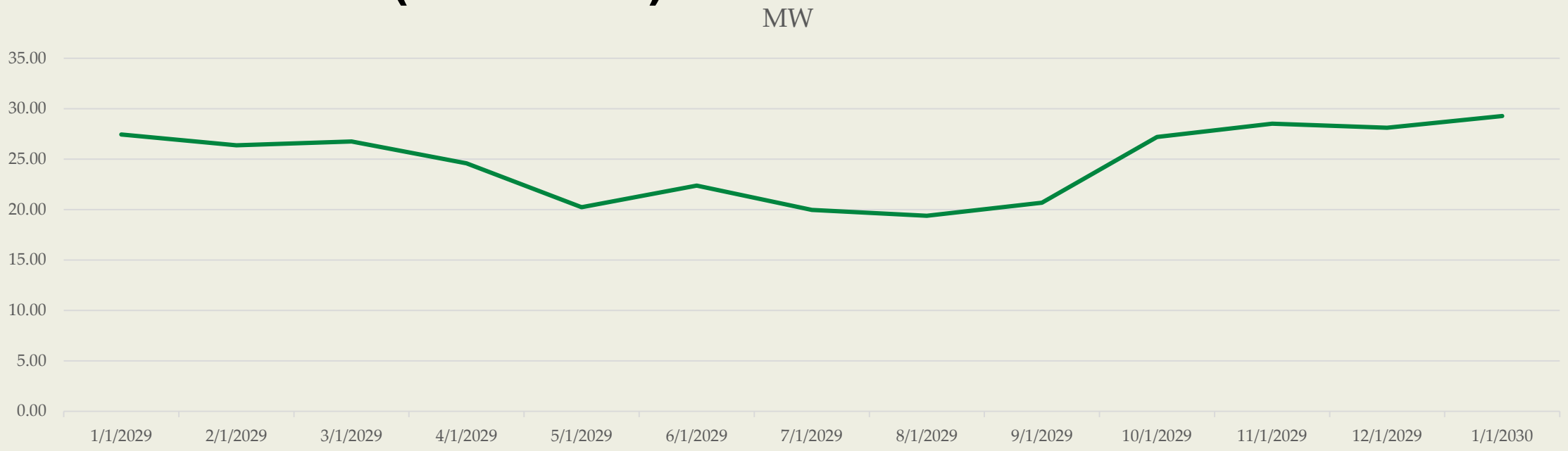
ISO-NE EV Forecast Demand for Vermont (Detail)



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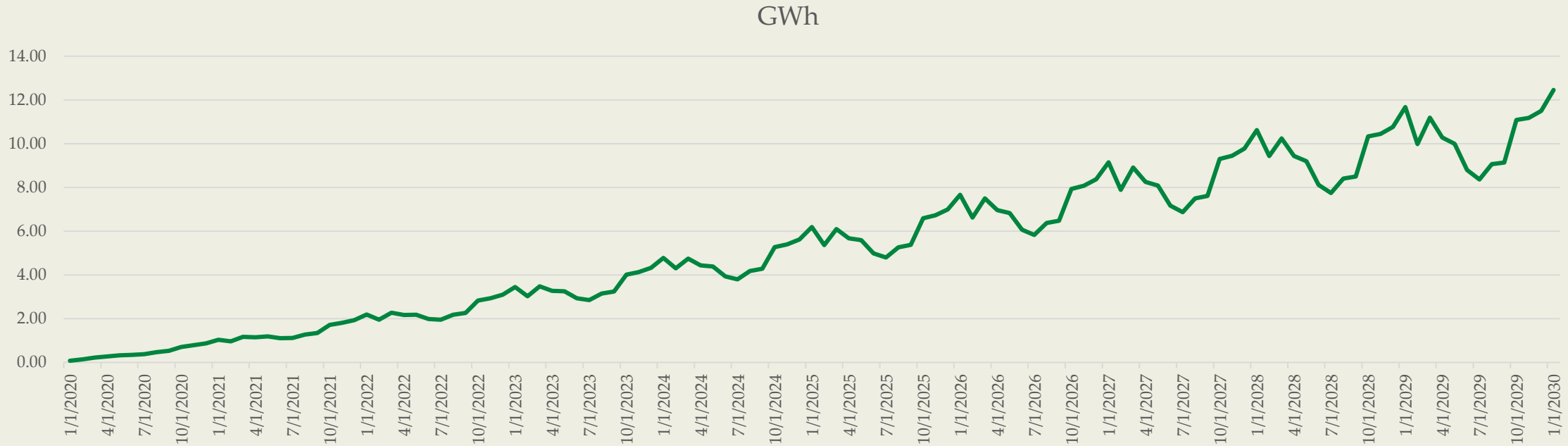
ISO-NE EV Forecast Monthly Energy for Vermont



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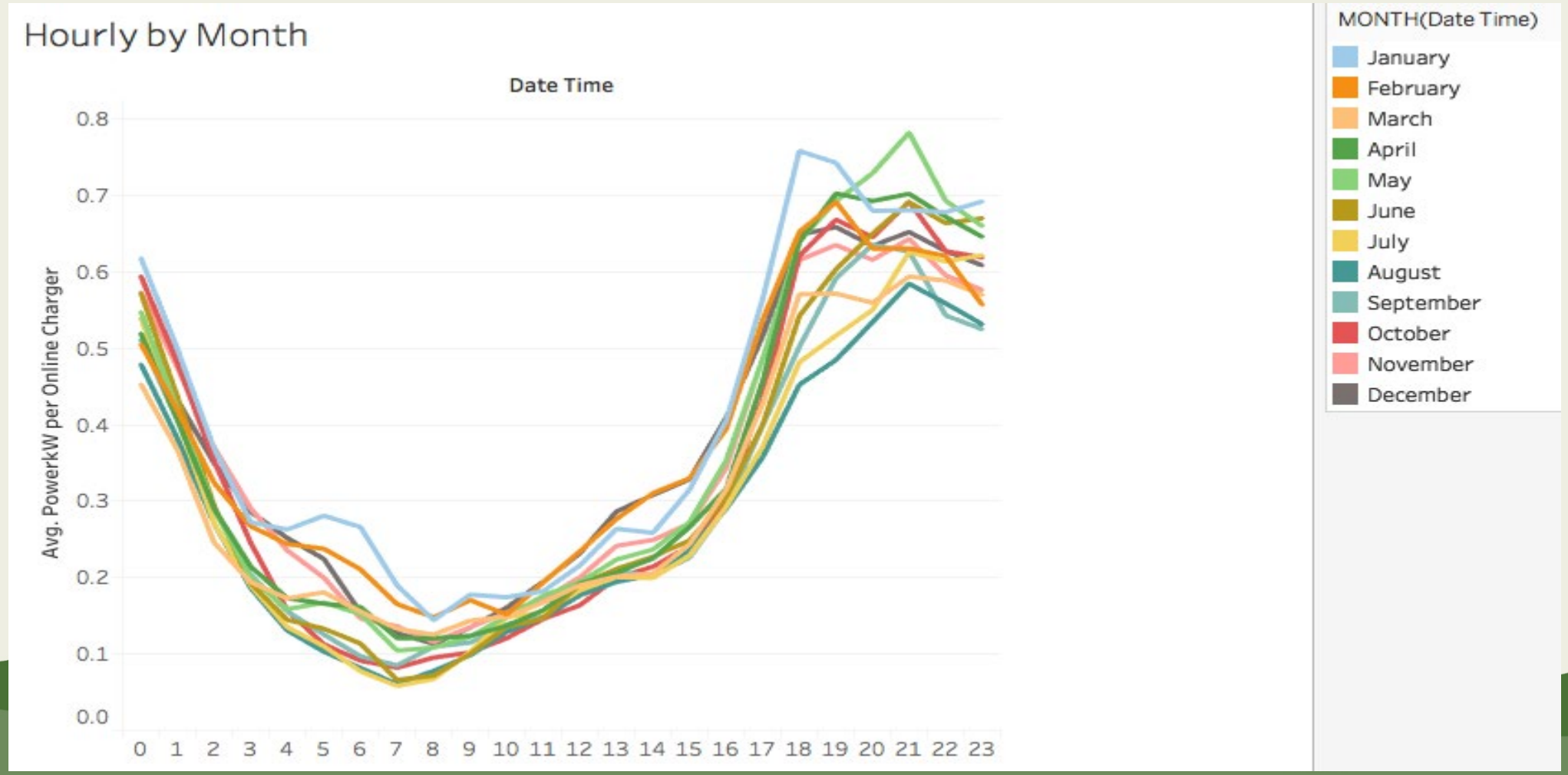
GMP Residential Charging by Hour



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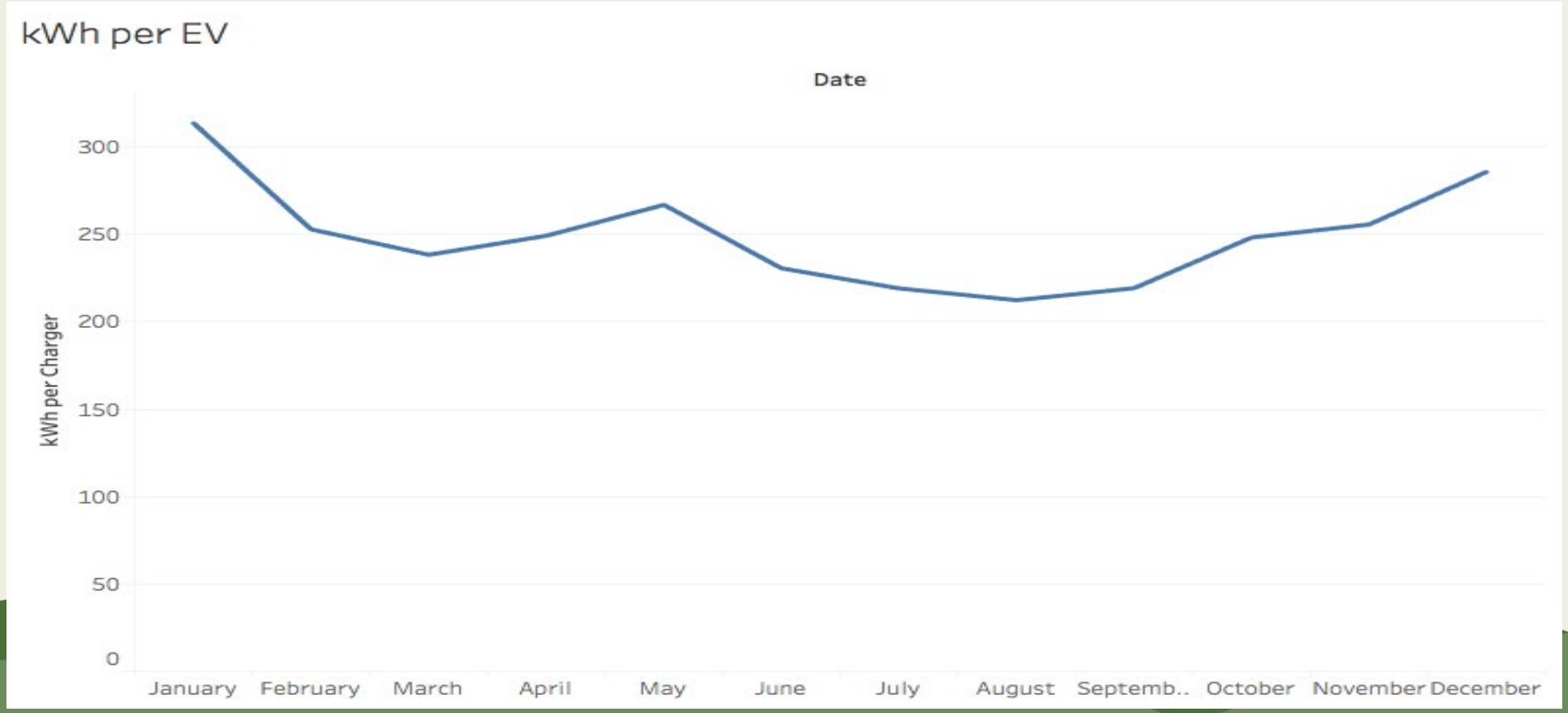
GMP Residential Charging by kWh



Shifting Load to Match Solar Production: Initial considerations

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Economic Considerations

- Clear price signals per kW regarding peak reduction
  - Regional Network Service Charge (Vermont monthly peak hours)
  - Forward Capacity Market (Single regional peak hour)
  - Reducing peaks reduces ratepayer costs
- Value of shifting load to specific hours?
  - Are daytime hours more valuable than overnight hours?
  - Is LMP the appropriate metric?
- Cost of software/hardware to enable shifting load?

Infrastructure Considerations

- Availability of workplace charging?
- Grid infrastructure – need to plan for full EV loads at the workplace (weekdays) and at home (weekends)?

Behavioral Considerations

- What rate structure provides sufficient incentive to charge during specific hours?
- To what extent is telecommuting going to increase?
- Is there a preference for charging at home vs. at a workplace or public charging station?