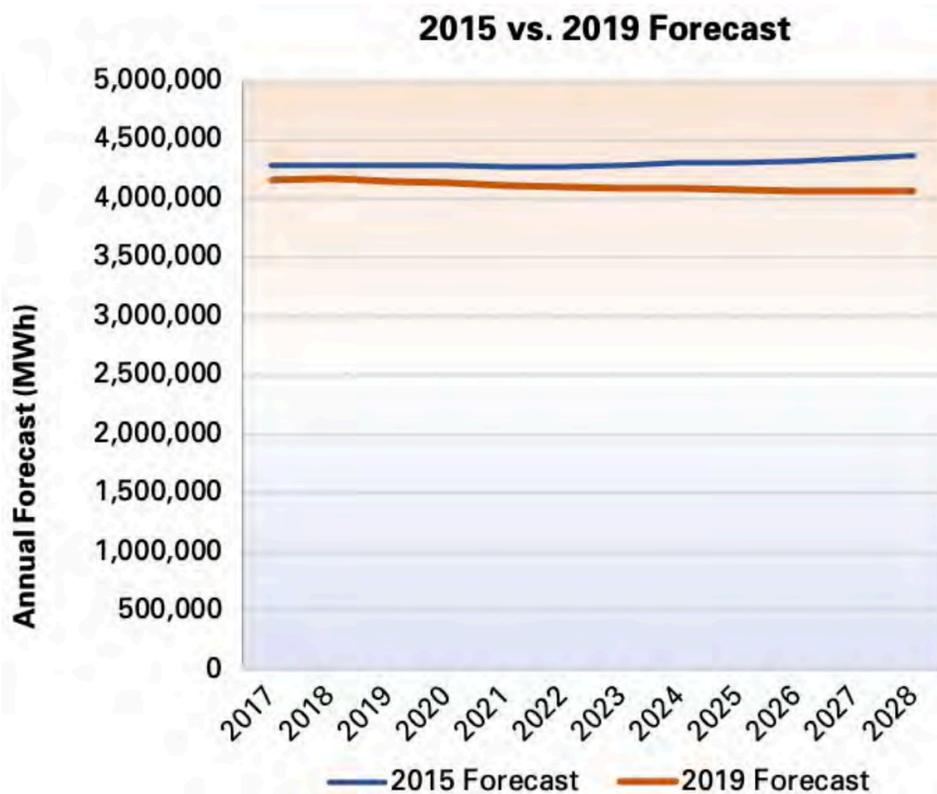


# **GMP STRATEGIC ELECTRIFICATION PLANNING**

**DPS RATE DESIGN WORKSHOP**

**APRIL 16, 2020**

## GMP CONTINUES TO PROJECT LOAD DECLINE



- ▶ GMP Recent IRP adjusted annual sales forecast downward
- ▶ Reduction continues to be due to Solar and Efficiency
- ▶ This forecast includes strategic electrification growth

## LOAD INCREASERS – HEAT PUMPS

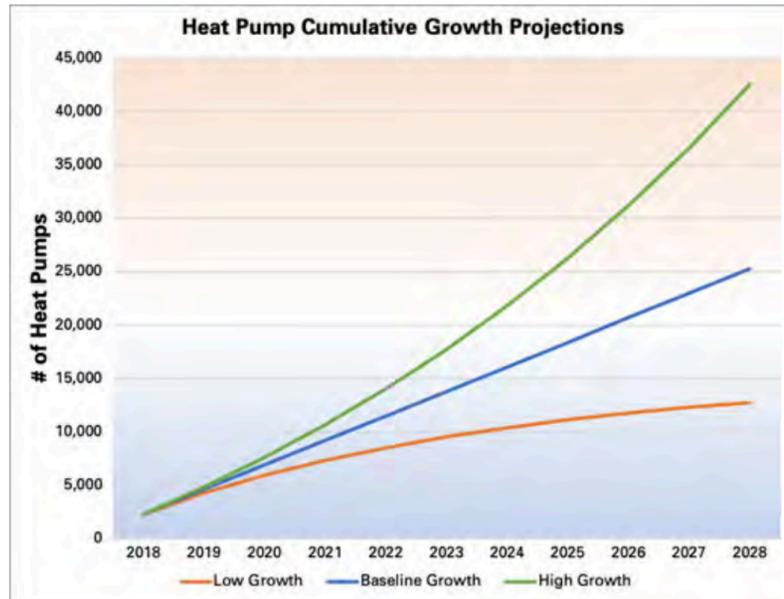


Figure 4-4. Cold-Climate Heat Pump Cumulative Growth Projections: 2018–2028

- ▶ Demand forecast based on Cadmus study commissioned by DPS
- ▶ Even at higher penetration, the total MW's spread across the system do not drive major system issues

▶ We expect the high growth case to play out

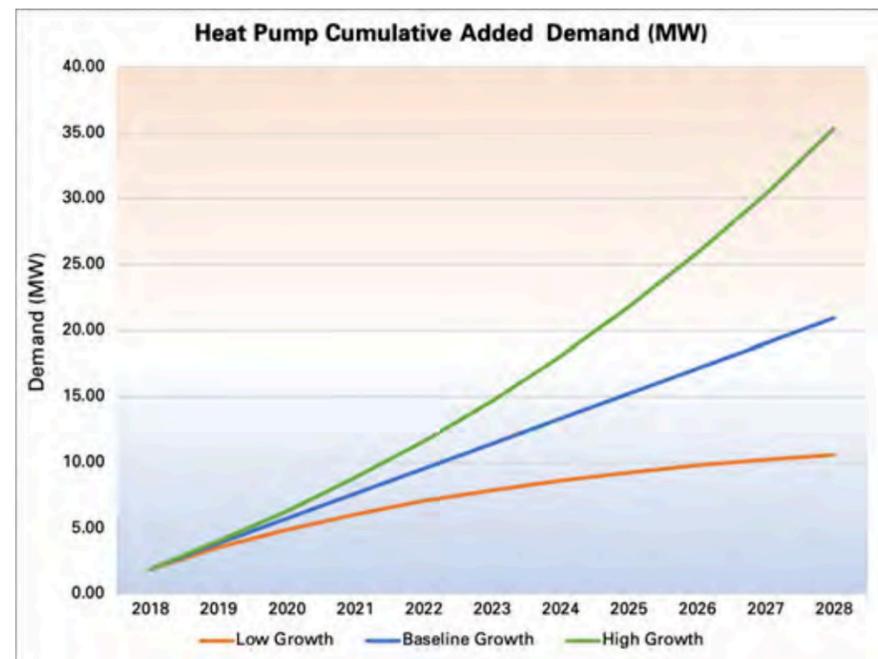
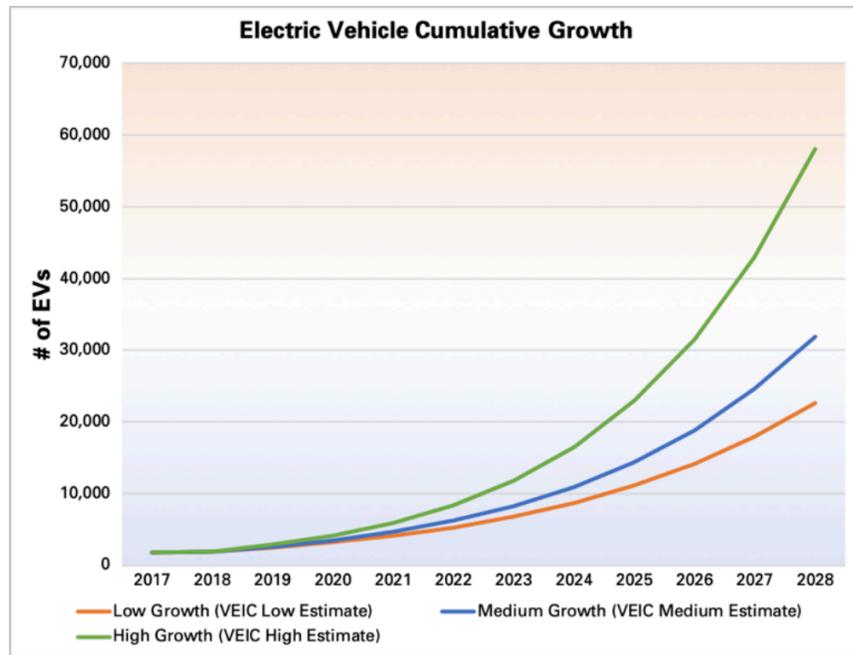


Figure 4-6. Cold-Climate Heat Pump Cumulative Added Peak Demand: 2018–2028

## LOAD INCREASERS – EV'S



- ▶ EV Deployment continues to be slow but anticipate a ramp up
- ▶ GMP saw approximately 700 new EV's in 2019

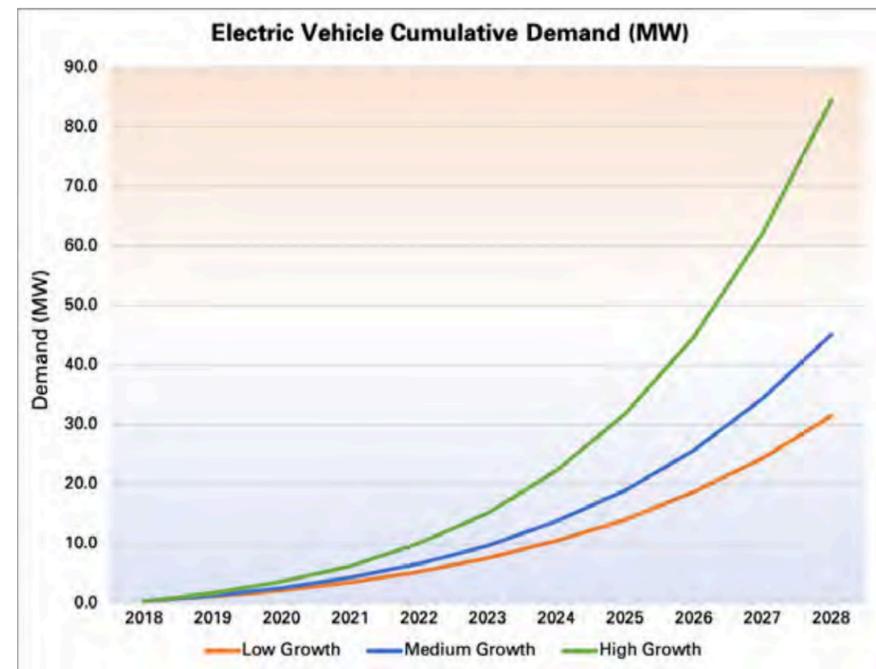
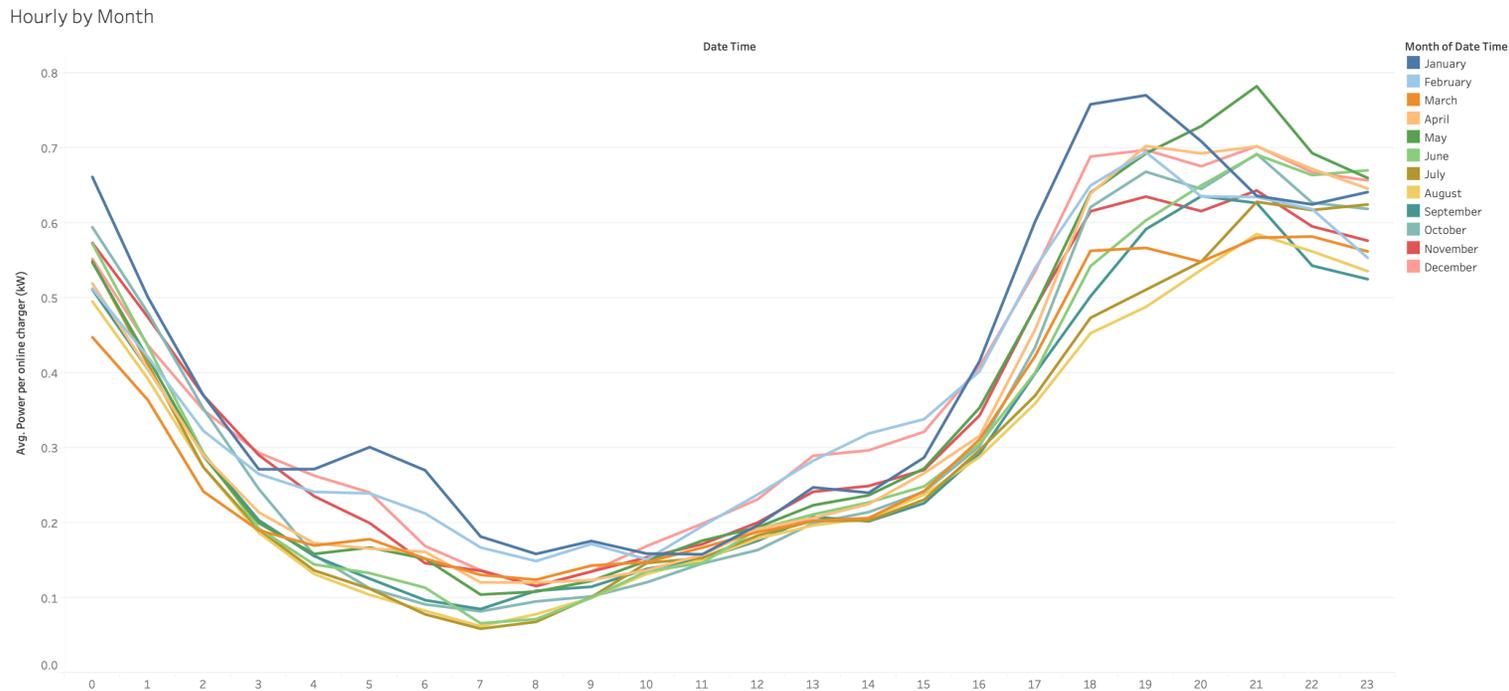


Figure 4-11. Electric Vehicle Cumulative Demand: 2018–2028

Figure 4-9. Electric Vehicle Cumulative Growth Projections: 2018–2028

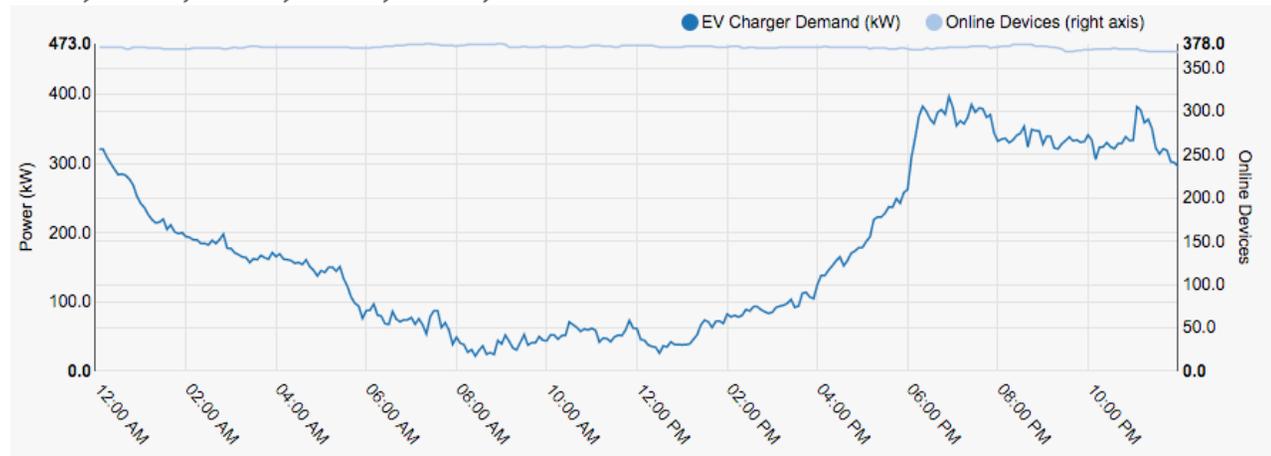
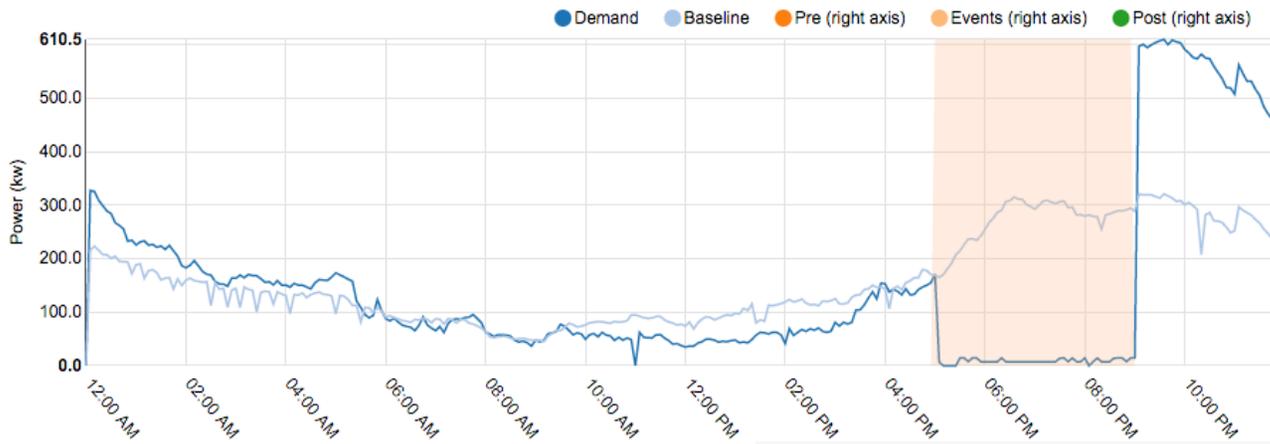
- ▶ Coincident peak demand is modeled at ~1.5kW per vehicle
- ▶ Actual data showing this is somewhat conservative with the actual coincident peak around 0.8kW but provides headroom
- ▶ This also assumes no control – which GMP has been doing for a few years now

## EV CHARGING DATA – LEVEL 2 HOME CHARGER



- ▶ GMP has been managing home Level 2 chargers for a few years now
- ▶ Each Charger has metering providing us with valuable demand data
- ▶ Data shows a peak of approximately 800 Watts max in the early evening hours

## CONTROLLED CHARGING



- ▶ GMP manages Level 2 home chargers and dispatches them off during peak times
- ▶ Two snapshots above – peak day and non-peak day

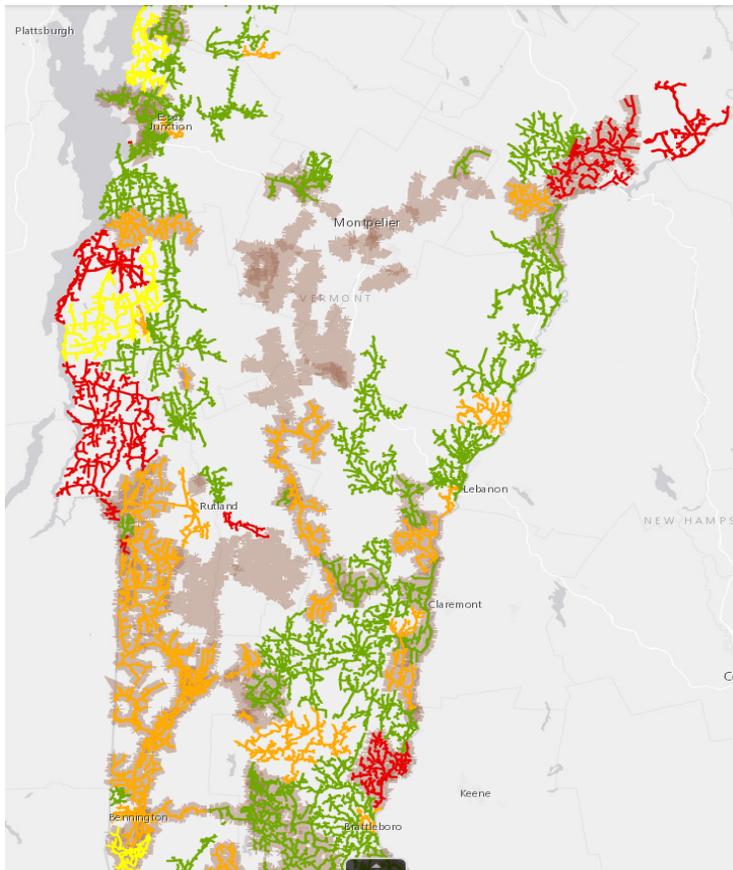
## EV SATURATION TESTING

Circuit	Residential Customers	5 KVA Transformers	7.5 KVA Transformers	10 KVA Transformers	15 KVA Transformers	Case	Overloaded Fuses	Overloaded Sections of Conductors and Cables	Overloaded Regulators	Overloaded Reclosers
SF-G20	1626	166	4	375	362	Base	0	0	0	0
						Add EV to 50% of residences	4	1	0	0
						Add EV to 100% of residences	6	3	2	4

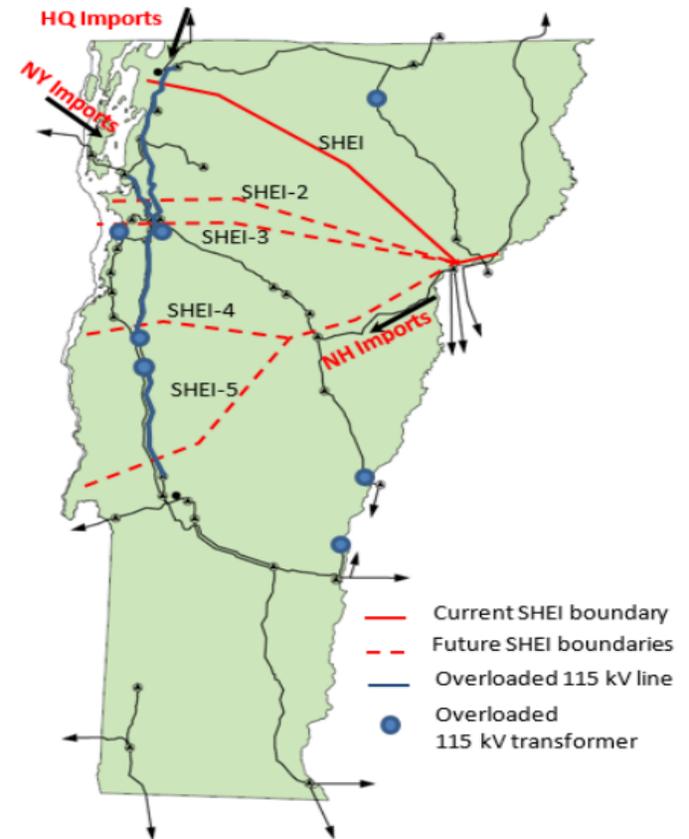
\*Example from Circuit Saturation Run

- ▶ GMP further studied the impact of significant penetrations of EV’s across a subset of circuits
- ▶ We took 10 circuits spread out across the State and applied a 50% and 100% residential uptake of EV’s and ran loadflows – using the 1.5kW coincident demand. We assumed NO load control in this modeling
- ▶ Results show that we do not run into significant distribution limitations beyond some specific device changeouts.
- ▶ GMP will be reviewing standard transformer sizing with an eye towards increasing our minimum sizing

# PV GROWTH



LOCATION OF TRANSMISSION CONSTRAINTS AS A RESULT OF HIGH SOLAR PV



- ▶ DU's do not currently plan the system around DG hosting capacity – upgrades are handled on an as needed basis when generation proposes to interconnect per VT Regulations
- ▶ Added load that is consuming during solar hours will provide a benefit to this situation

## CONCLUSION

- ▶ GMP will be starting it's next IRP in the coming year
- ▶ We are not seeing strategic electrification driving an urgent need on the T&D system at the sub-transmission and distribution levels which also provides us more time to plan
- ▶ Distributed Generation saturation is currently driving system limitations which is ultimately hitting hosting capacity limits on more and more circuits

# THANK YOU

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