WESTERN RESOURCE ADEQUACY PROGRAM

Review of preliminary, non-binding WRAP regional data for the current participating footprint for the Winter 2025-2026 Season

June 13, 2024

Today's Objectives

- Provide an overview of:
  - the loads and resources in the WRAP Region
  - installations and nameplate for wind and solar
  - the Qualifying Capacity Contributions (QCC) and Effective Load Carrying Capability (ELCC) values for each resource class
  - Forward Showing Planning Reserve Margin (FSPRM) values

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Before We Begin

- Modeling assumes full binding implementation of the WRAP design
  - Metrics assume diversity benefit and a level of forward procurement on aggregate that is not presently expected without binding implementation of the WRAP
- Modeling was performed based on the WRAP Region in early 2024
  - Included all WRAP Participants
  - Changes to WRAP participation in future phases will impact these metrics
  - These assessments cannot account for adequacy needs or activities of non-participating load or resources
- Be aware of the limits of drawing regional conclusions from aggregate information
  - Information is best applied at the level of individual LREs; WRAP's scope does not include matching LREs in need of additional forward procurement with available resources
  - It cannot be assumed that all resources modeled in the loss of load expectation (LOLE) study will be available to the WRAP Region
  - Planned outages are not considered; they will be managed by LREs from any surplus

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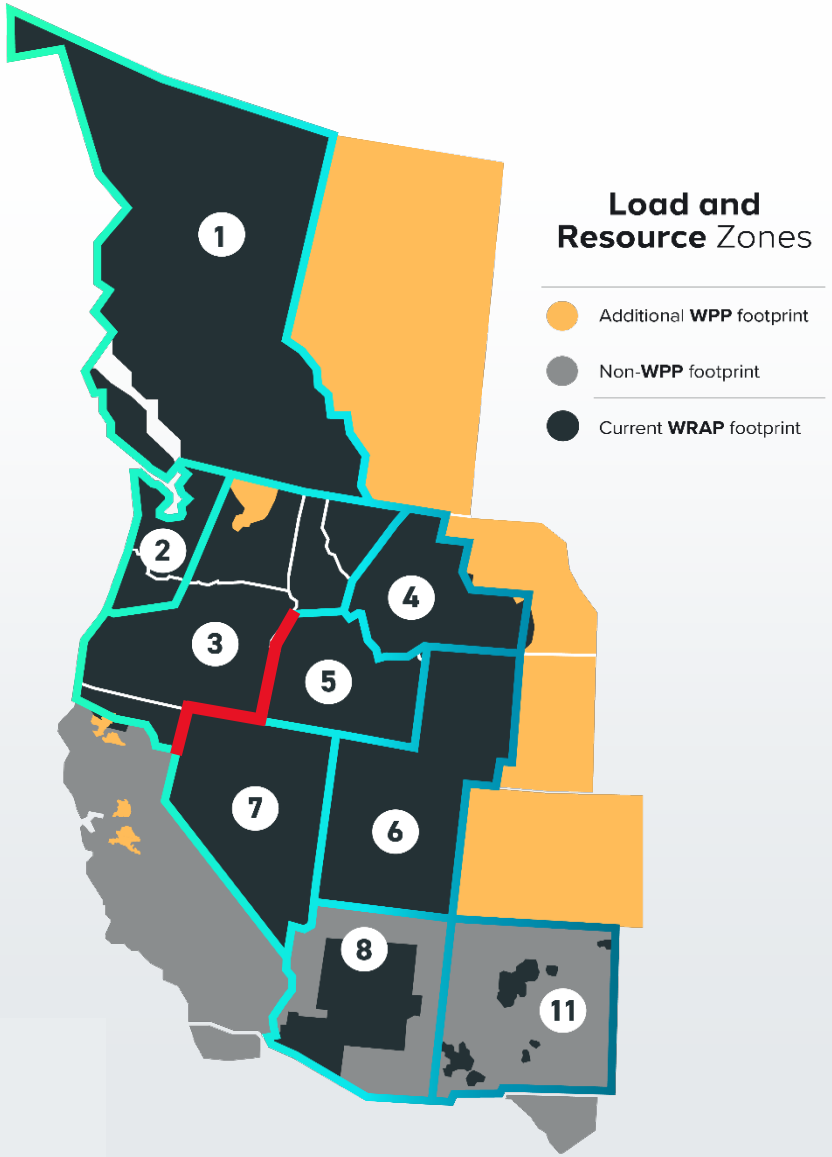
Load and Resource Zones



Subregion	Zone	Geographical Description
MidC	Zone 1	British Columbia
	Zone 2	West of Cascades
	Zone 3	East of Cascades
	Zone 4	NorthWestern
SWEDE	Zone 5	Idaho Power
	Zone 6	PacifiCorp East
	Zone 7	Nevada
	Zone 8	Arizona
	Zone 11	New Mexico

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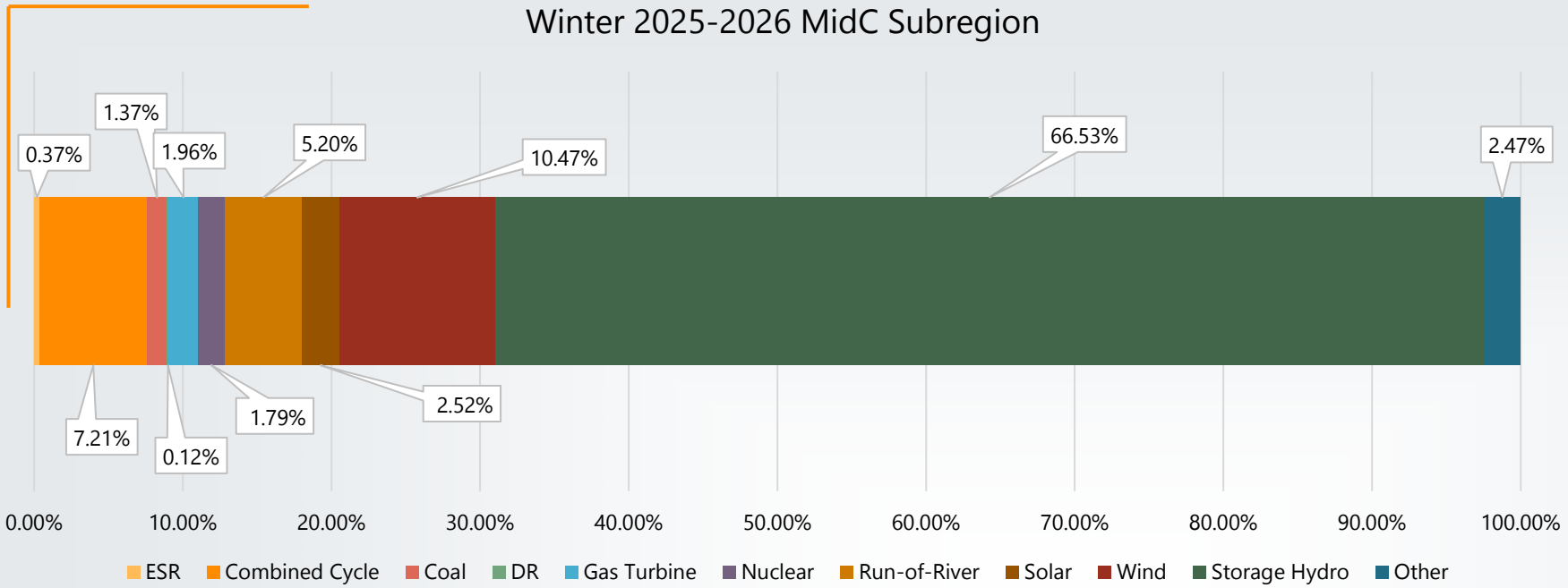
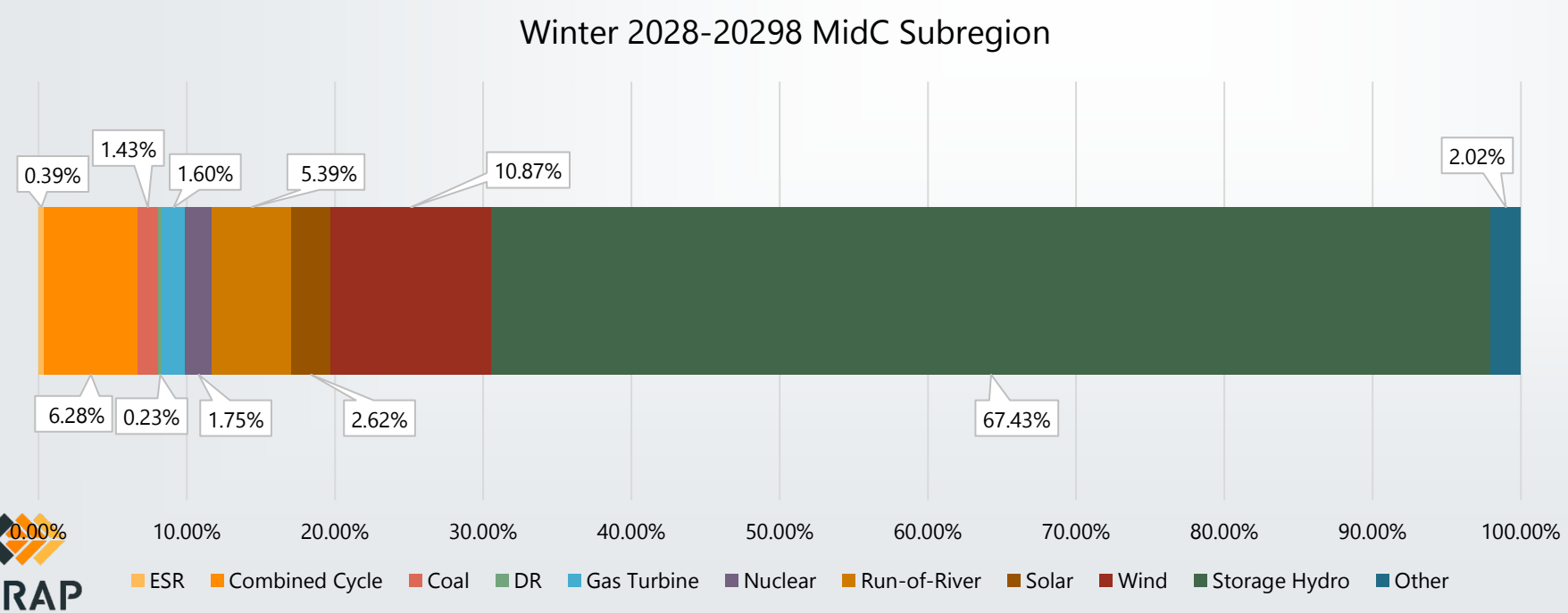
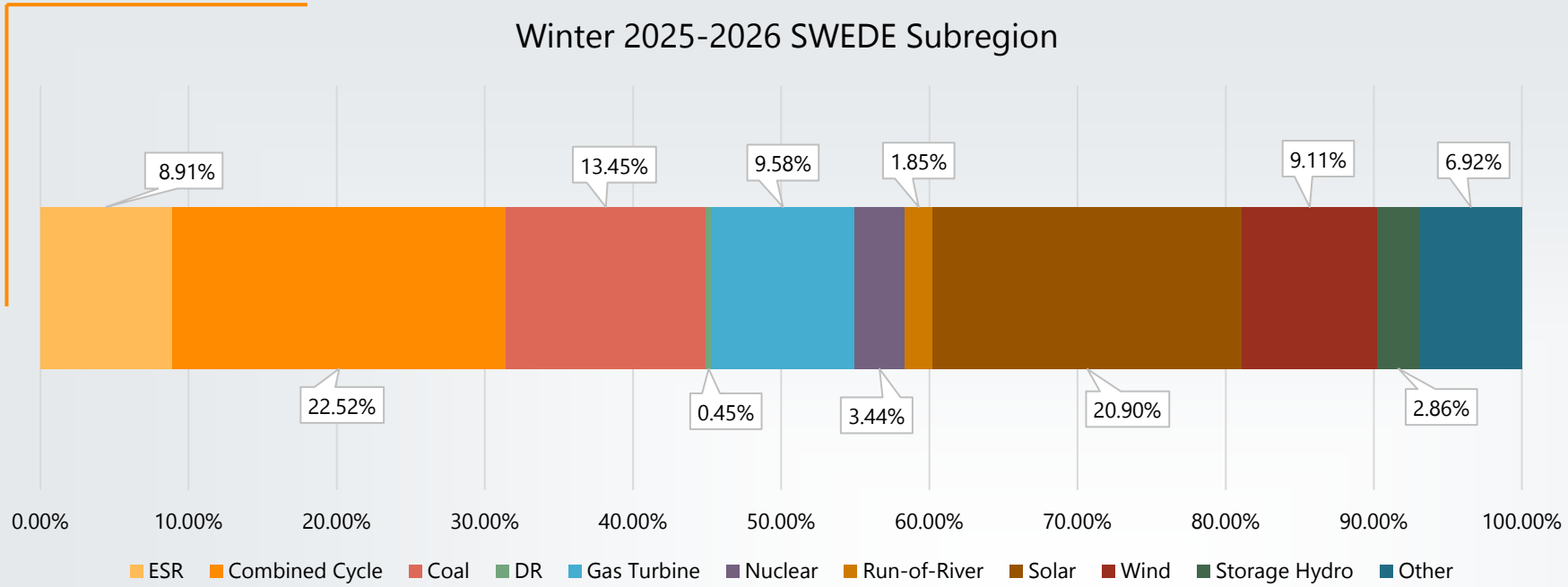




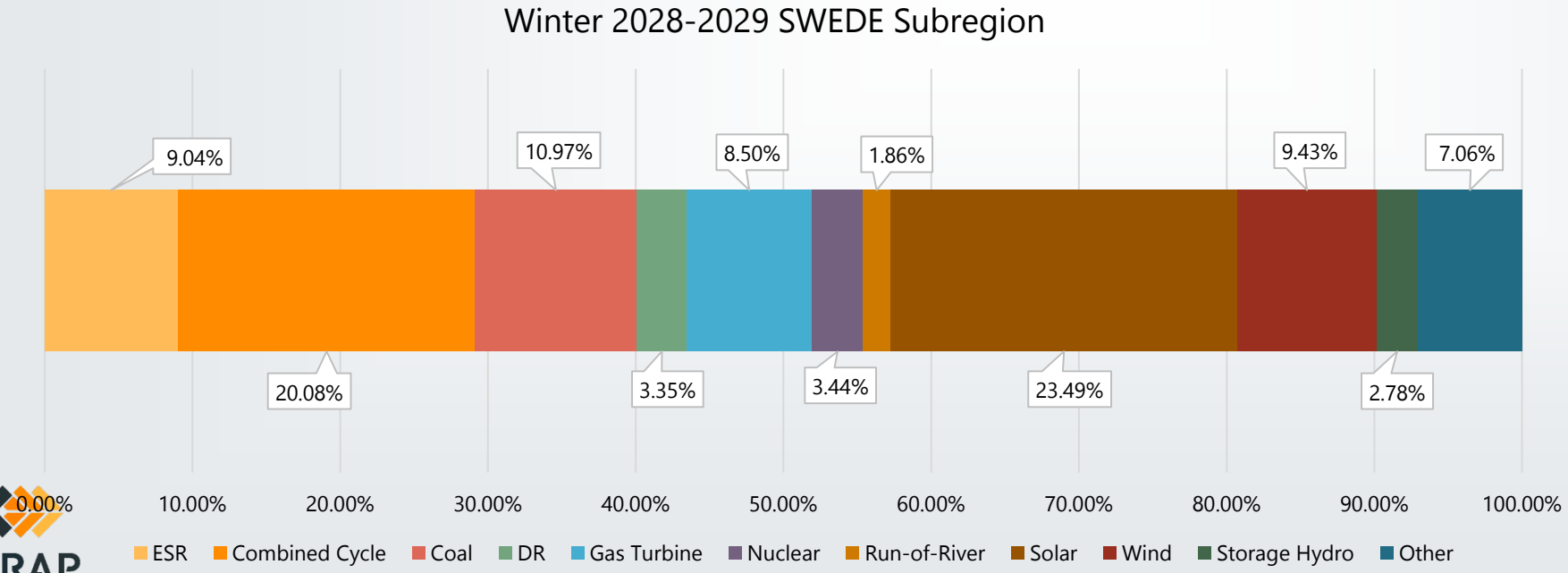
MidC Subregion Winters

Percentage



SWEDE SUBREGION WINTERS

Percentage



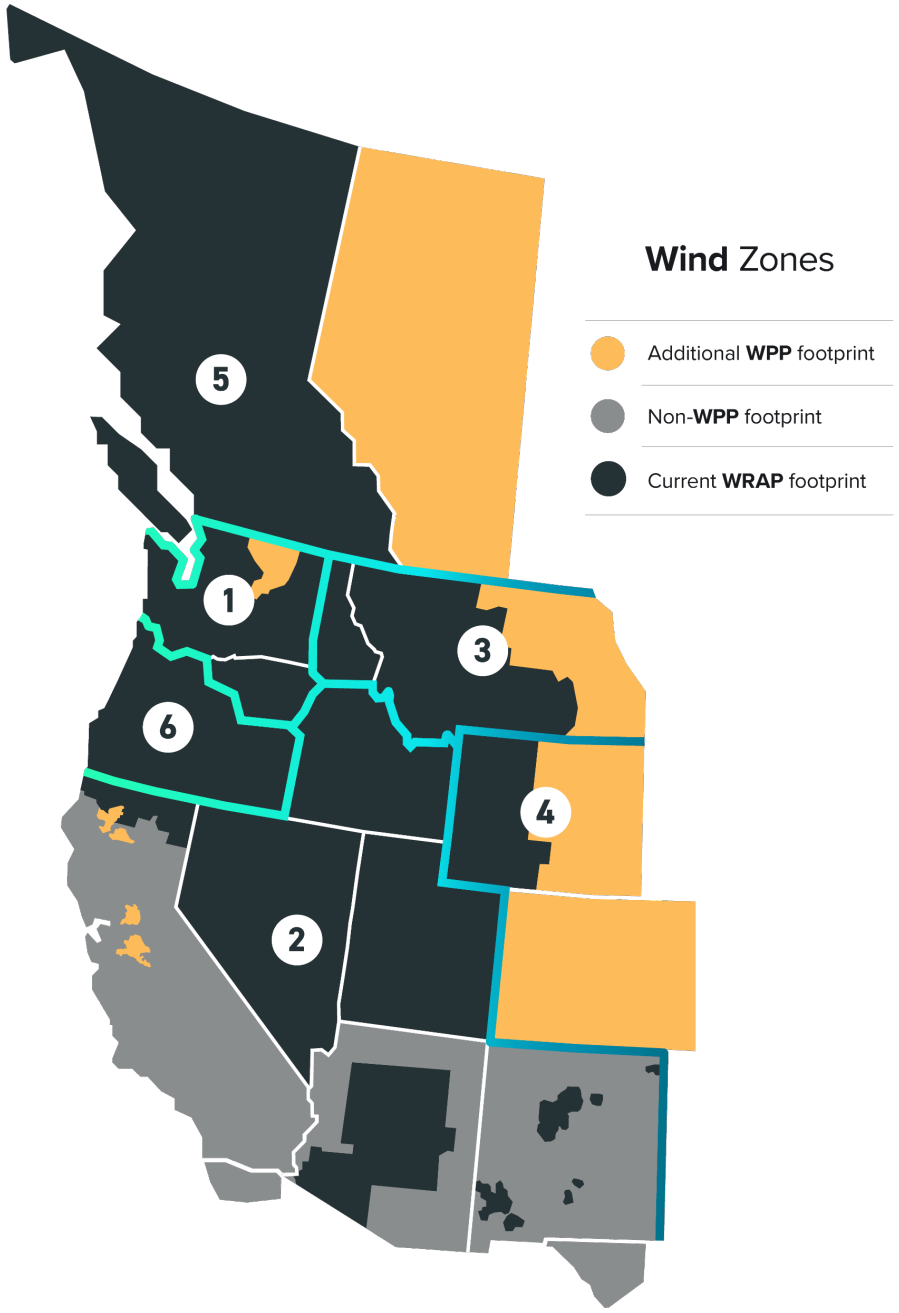
REMINDERS

- Not all resources shown in the preceding slides can be assumed to be available to the WRAP Region for resource adequacy purposes
  - Planned outages are not considered; they will be managed by LREs from any surplus
  - Does not account for activities and needs of neighboring, non-participating regions or entities
  - Based on information and projections provided by Participants
- Aggregate information does not give insight into whether individual Participants have enough supply
  - WRAP incentivizes Participants to acquire the necessary capacity
  - Cannot assume procurement or contracting has happened or will happen without binding implementation of WRAP

Key Takeaways

- WRAP Region is seeing planned resource retirements which could impact capacity available to meet 1 event day-in-10 year LOLE per Season
- However, SWEDE is seeing significant increase in resources, particularly VERs, with very aggressive planned builds targets to maintain 1 event day-in-10 year LOLE per Season

Wind Zones



Zone	Nameplate Capacity (MW)
Wind VER1	**4,991**
Wind VER2	**2,989**
Wind VER3	**1,323**
Wind VER4	**2,745**
Wind VER5	**747**
Wind VER6	No wind
Total	**12,795**

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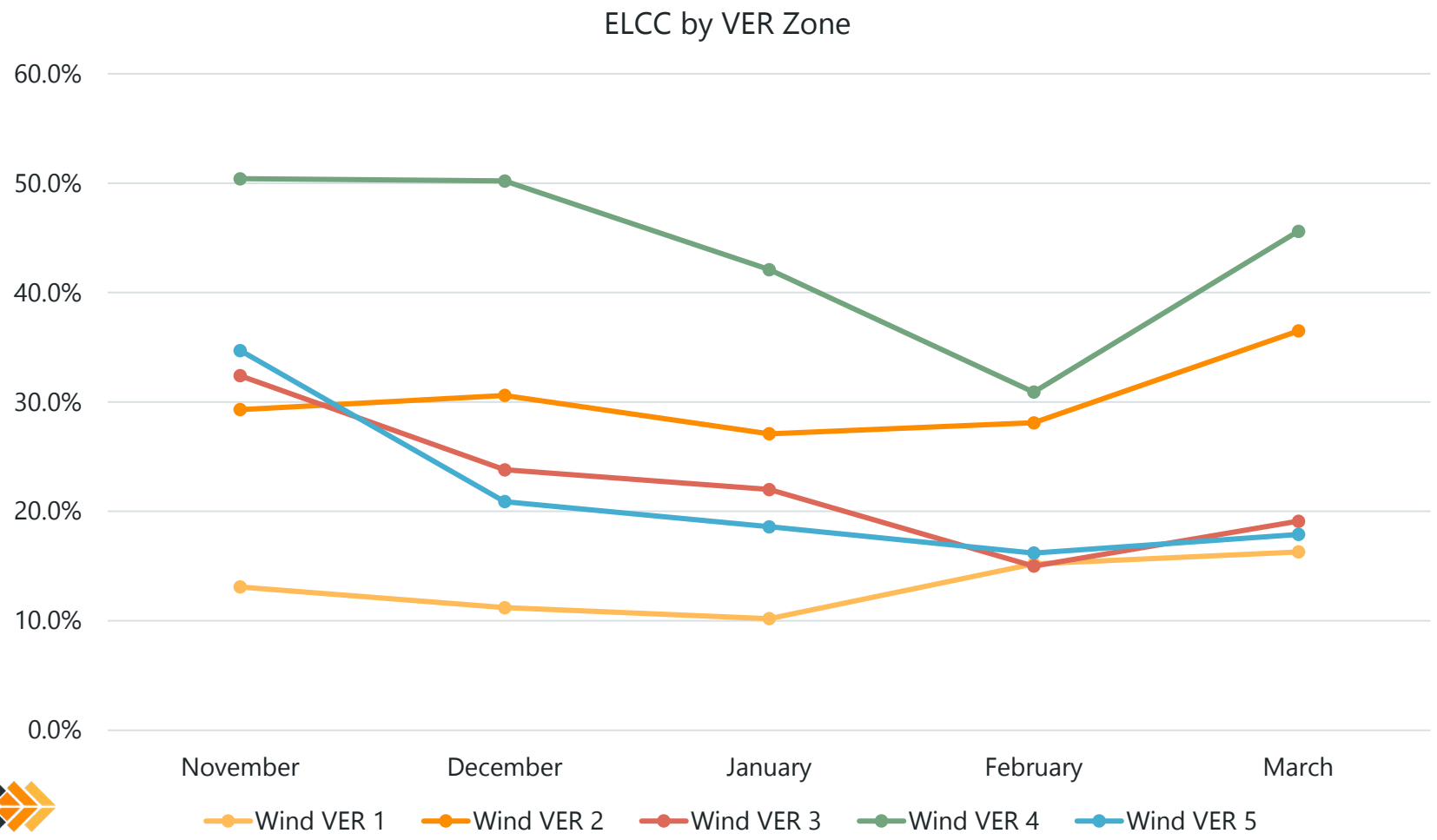
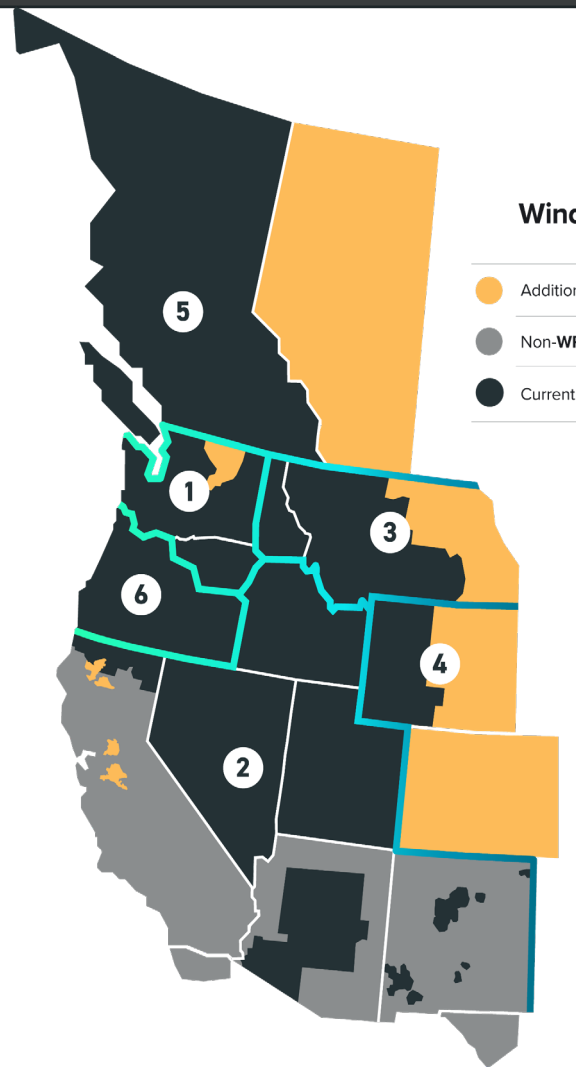
Wind ELCC - Winter





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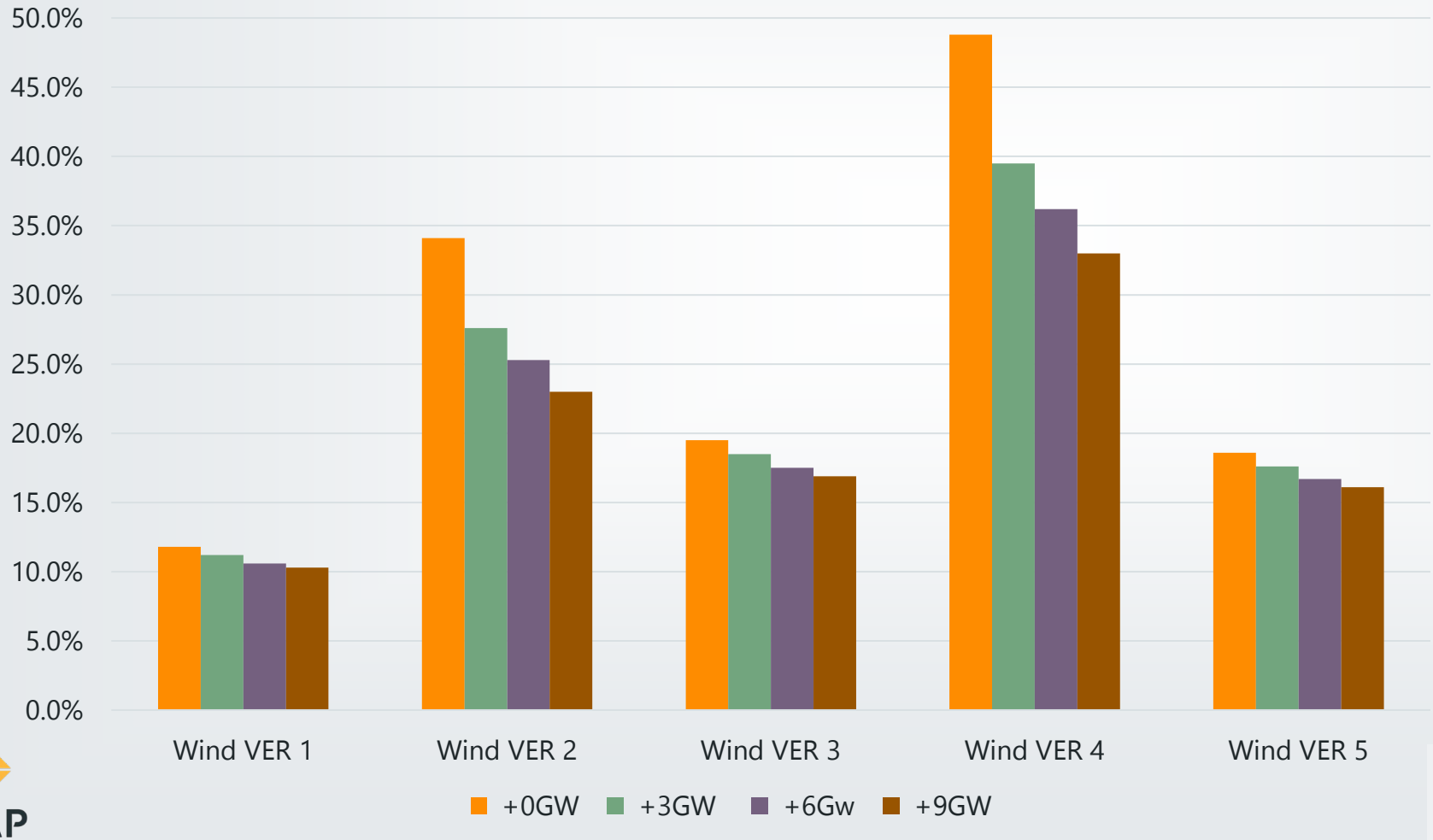
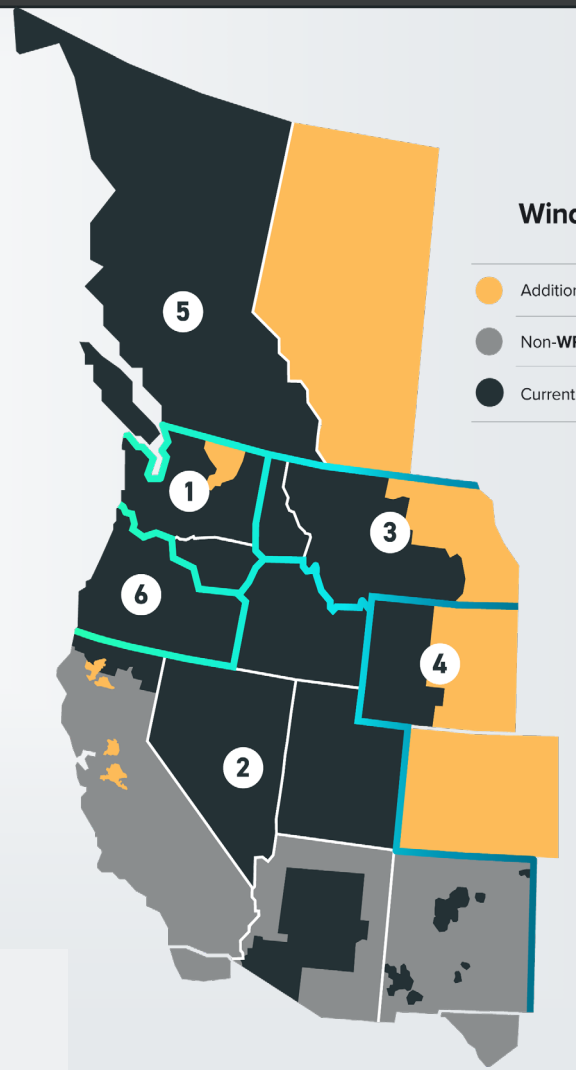
Wind ELCC

Wind at Incremental GW Installations





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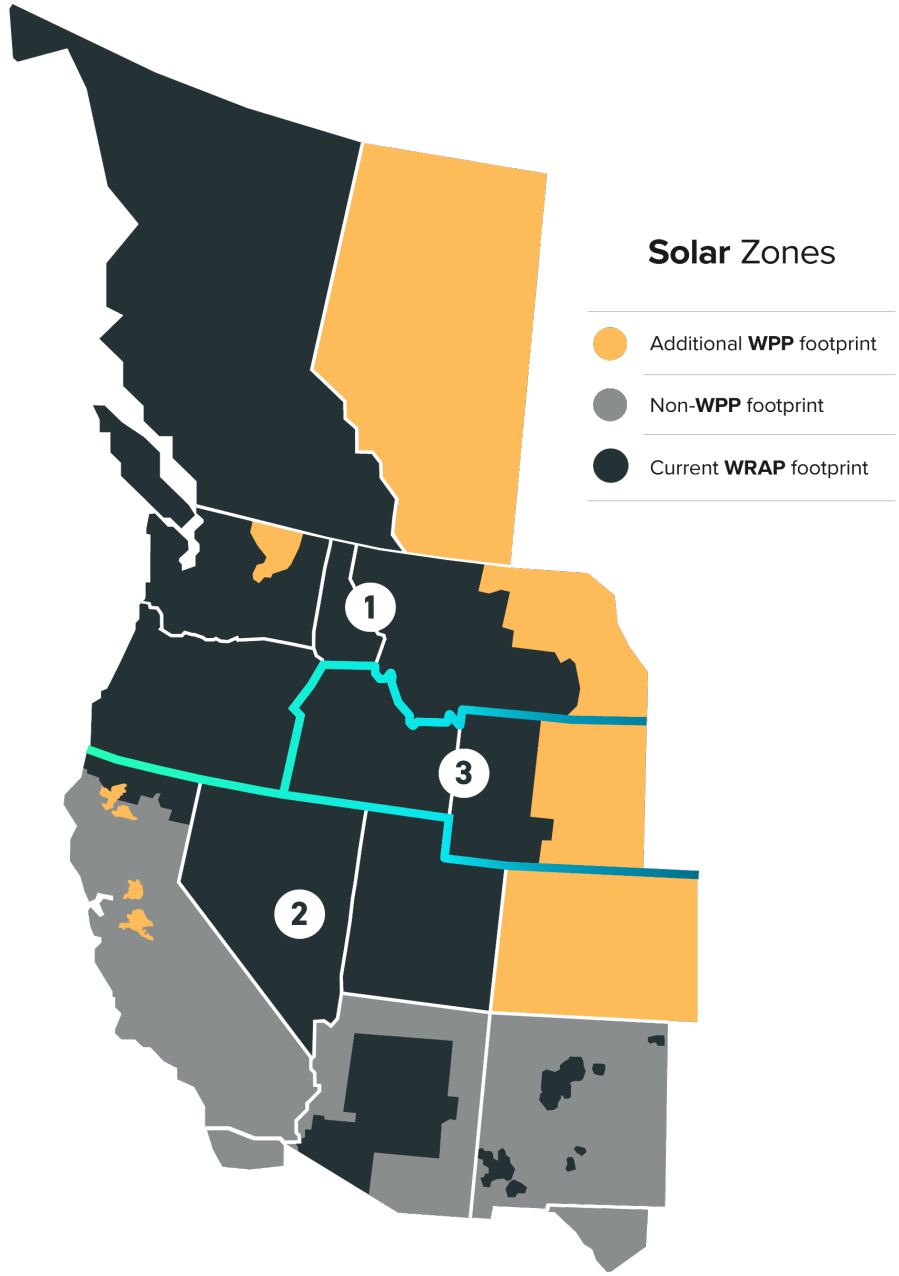
Solar Zones



Zone	Nameplate Capacity (MW)
Solar VER1	**1,700**
Solar VER2	**12,267**
Solar VER3	**889**
Total	**14,856**

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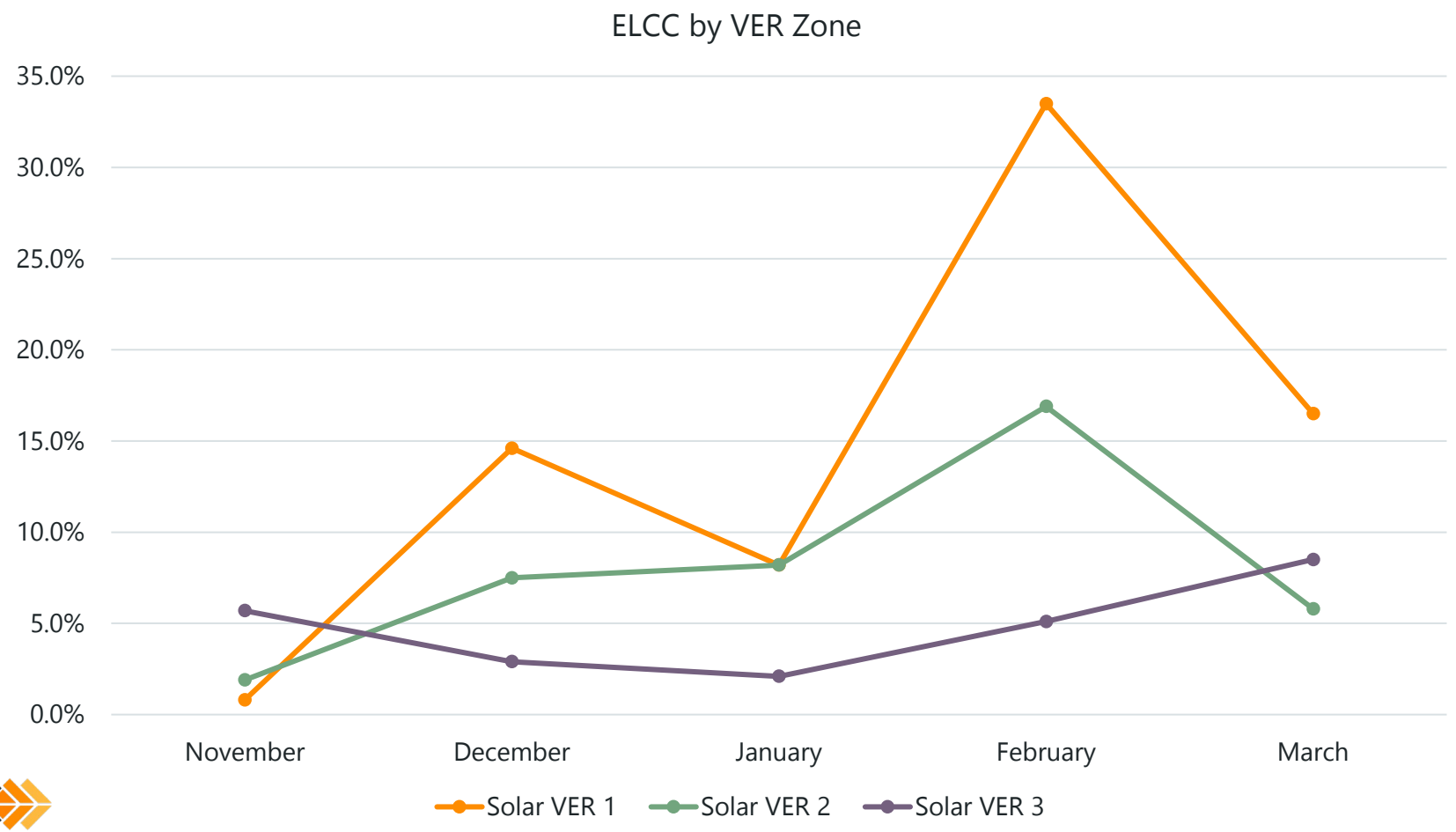
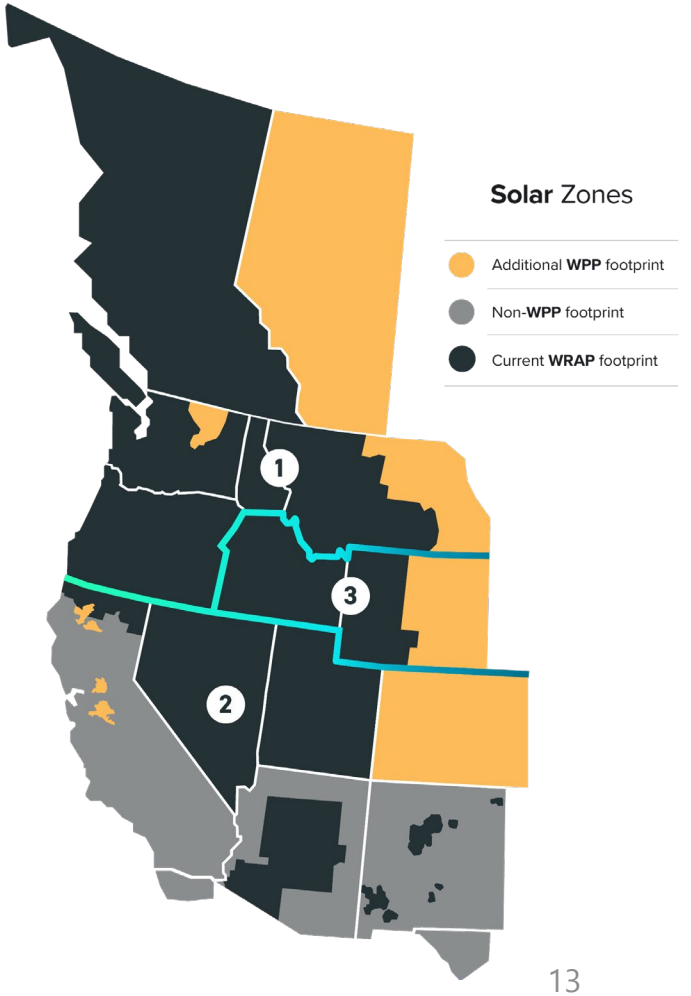
Solar ELCC - Winter





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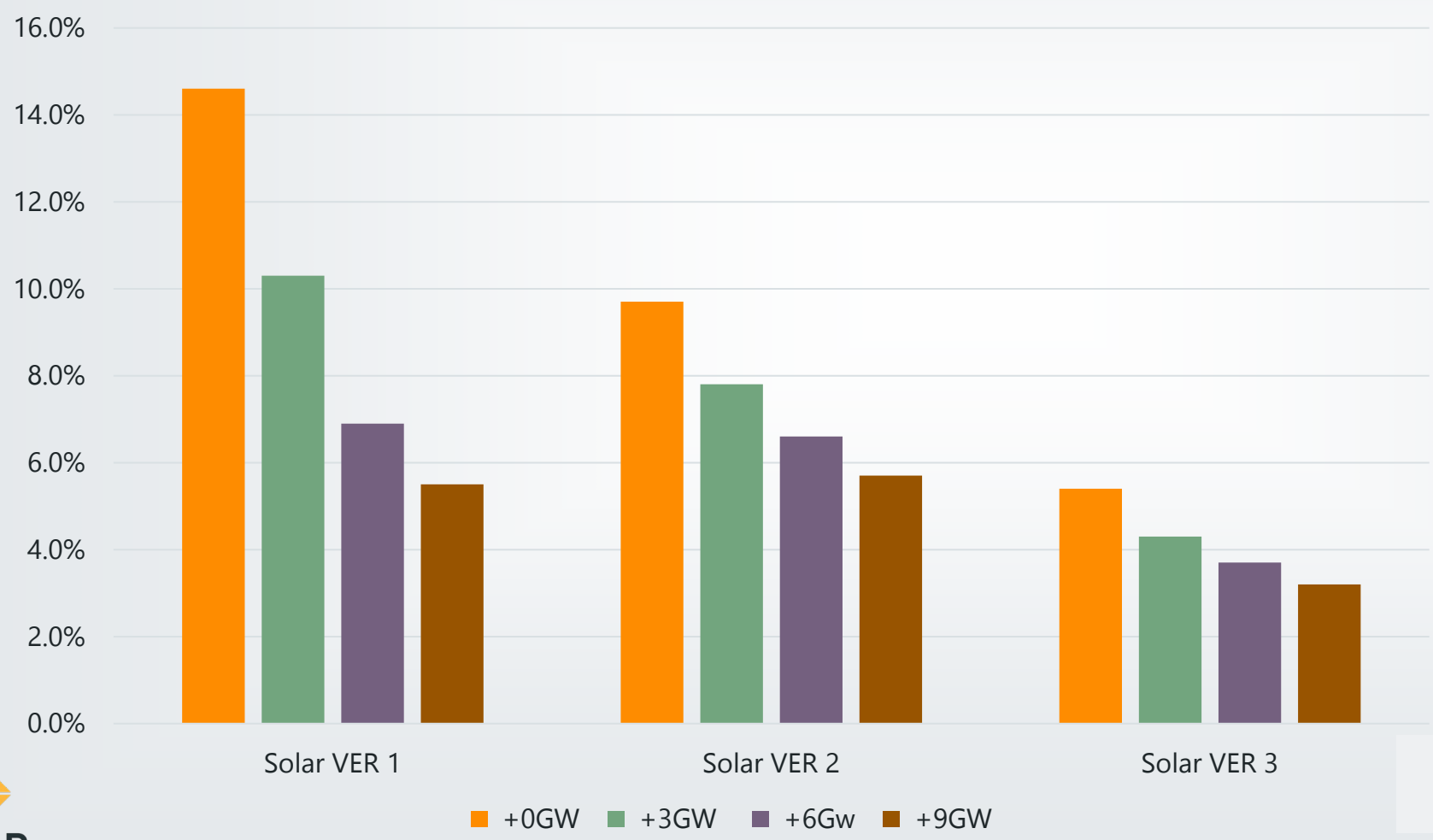
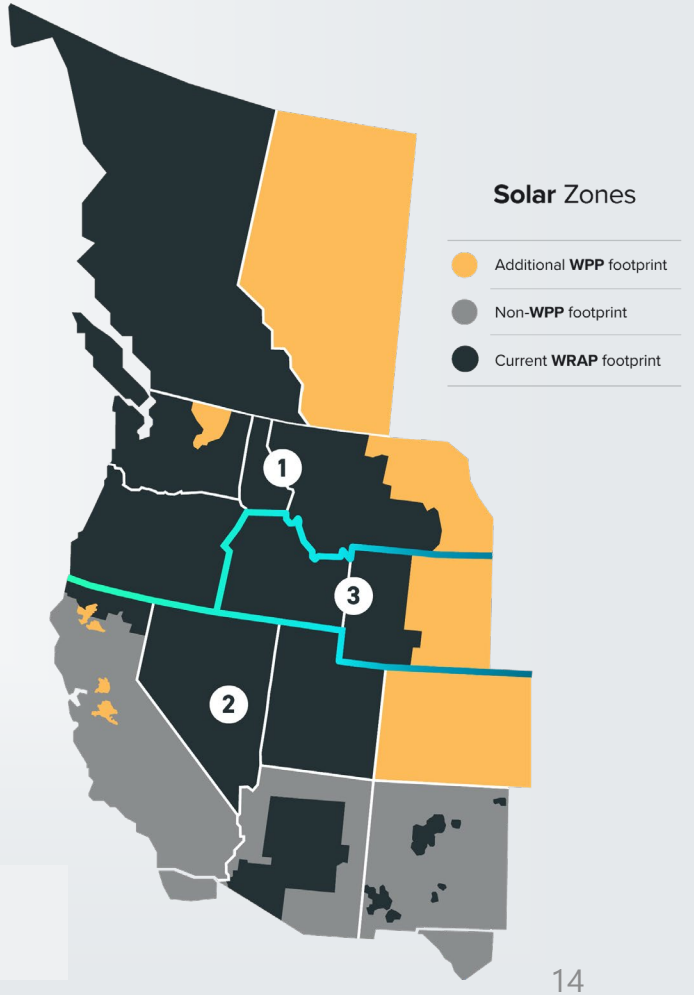
Solar ELCC

Solar at Incremental GW Installations





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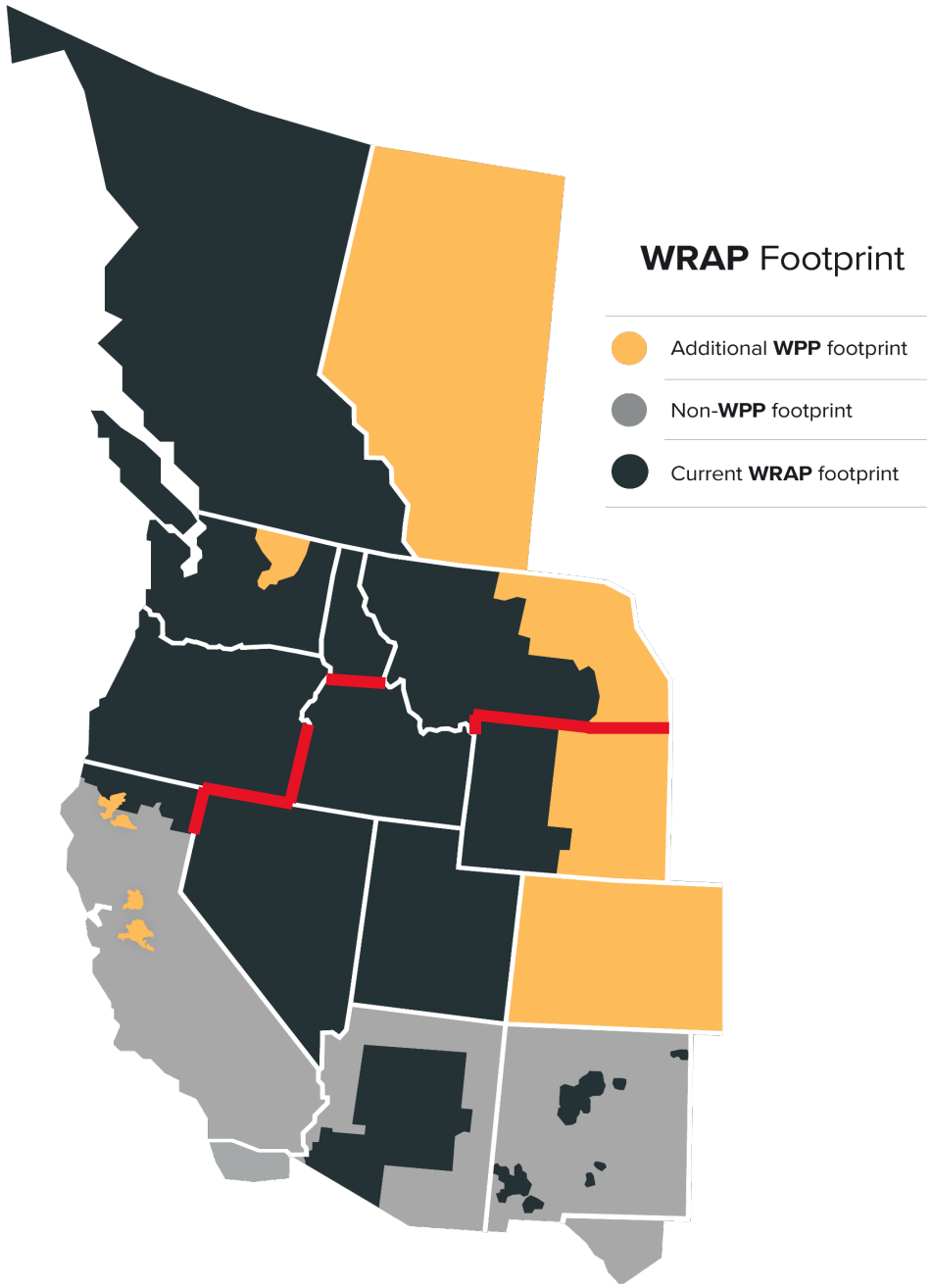
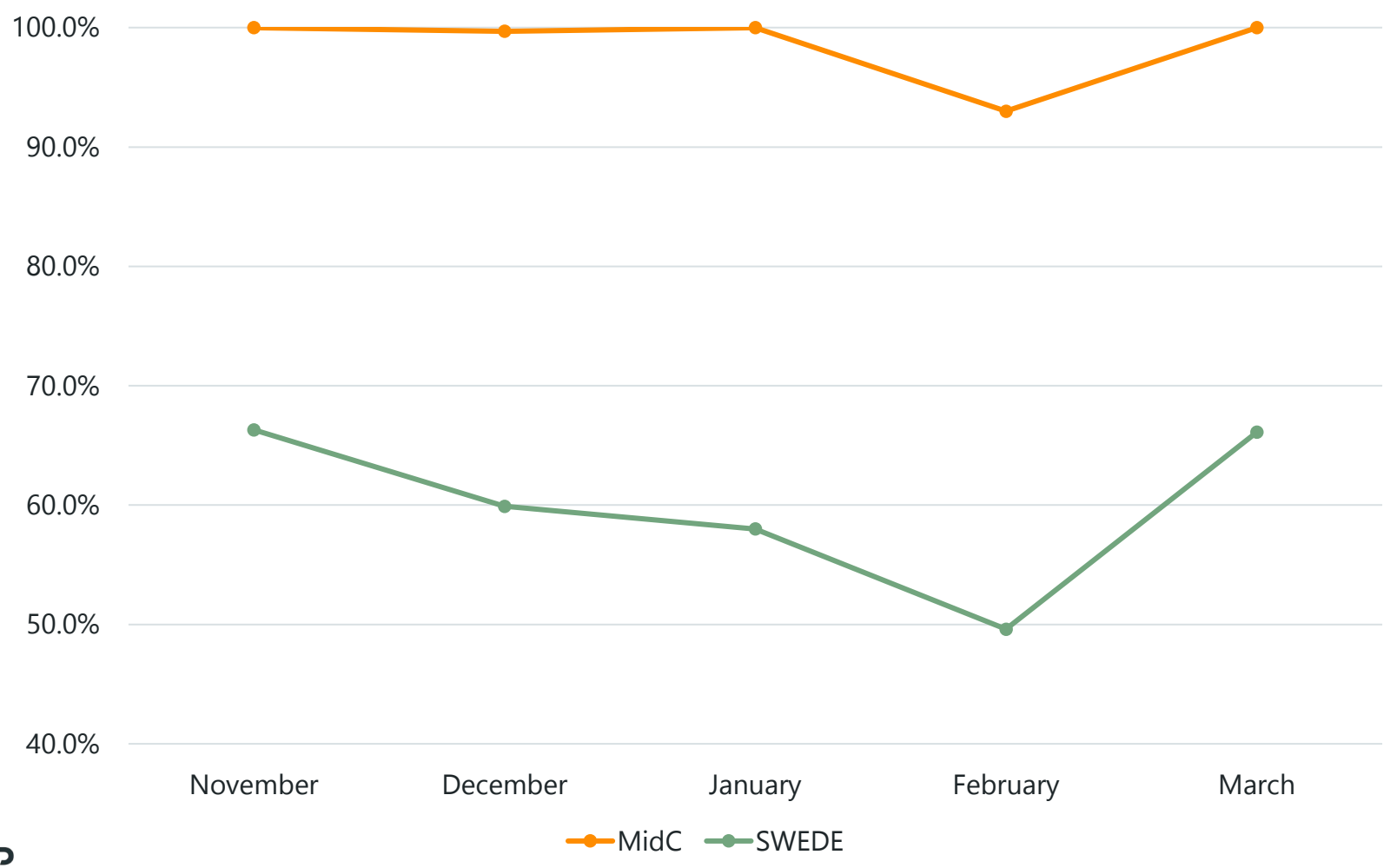
Energy Storage Resource (ESR) Zones



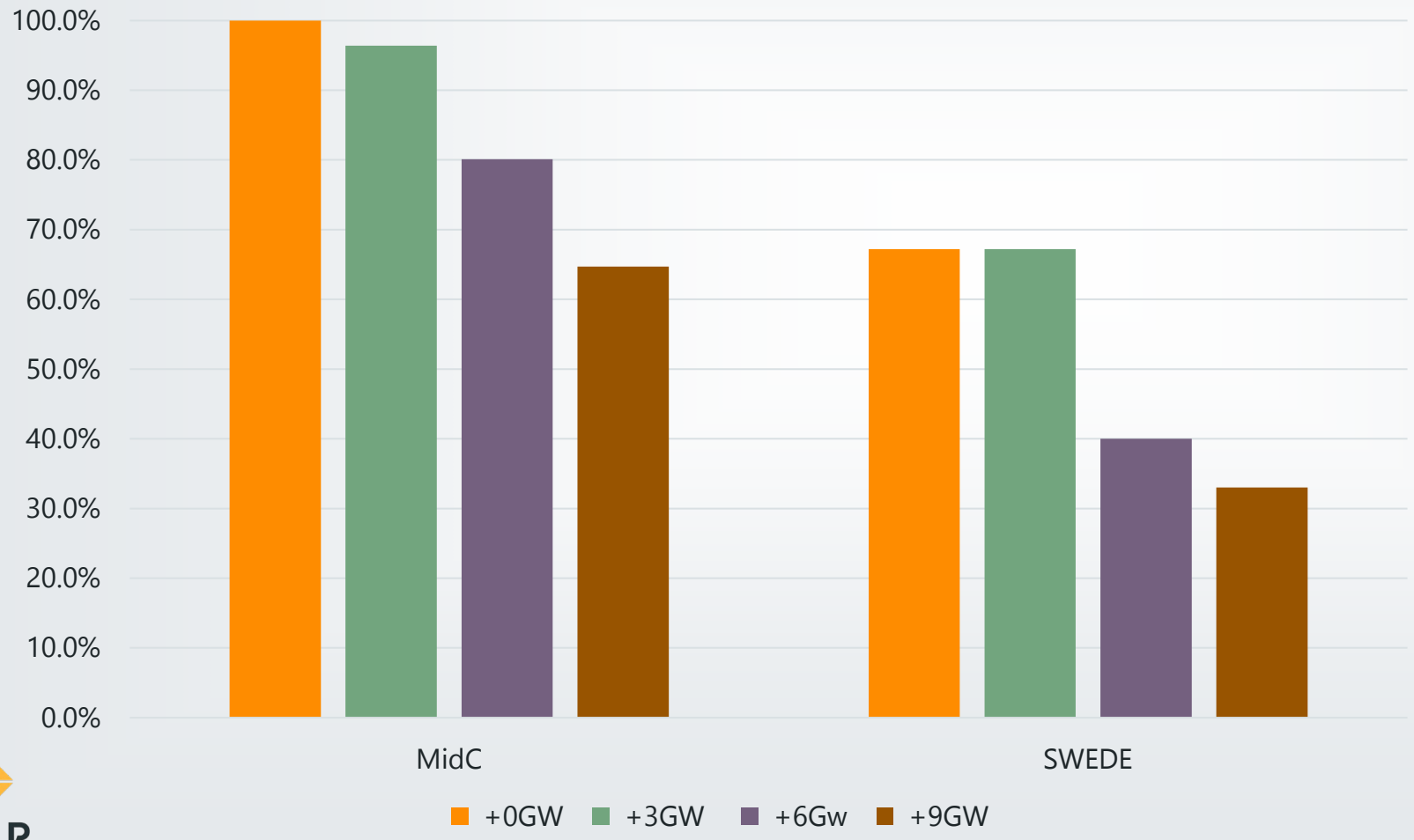
Subregion	Nameplate Capacity (MW)
MidC	**253**
SWEDE	**5,612**
Total	**5,865**

ESR ELCC - Winter

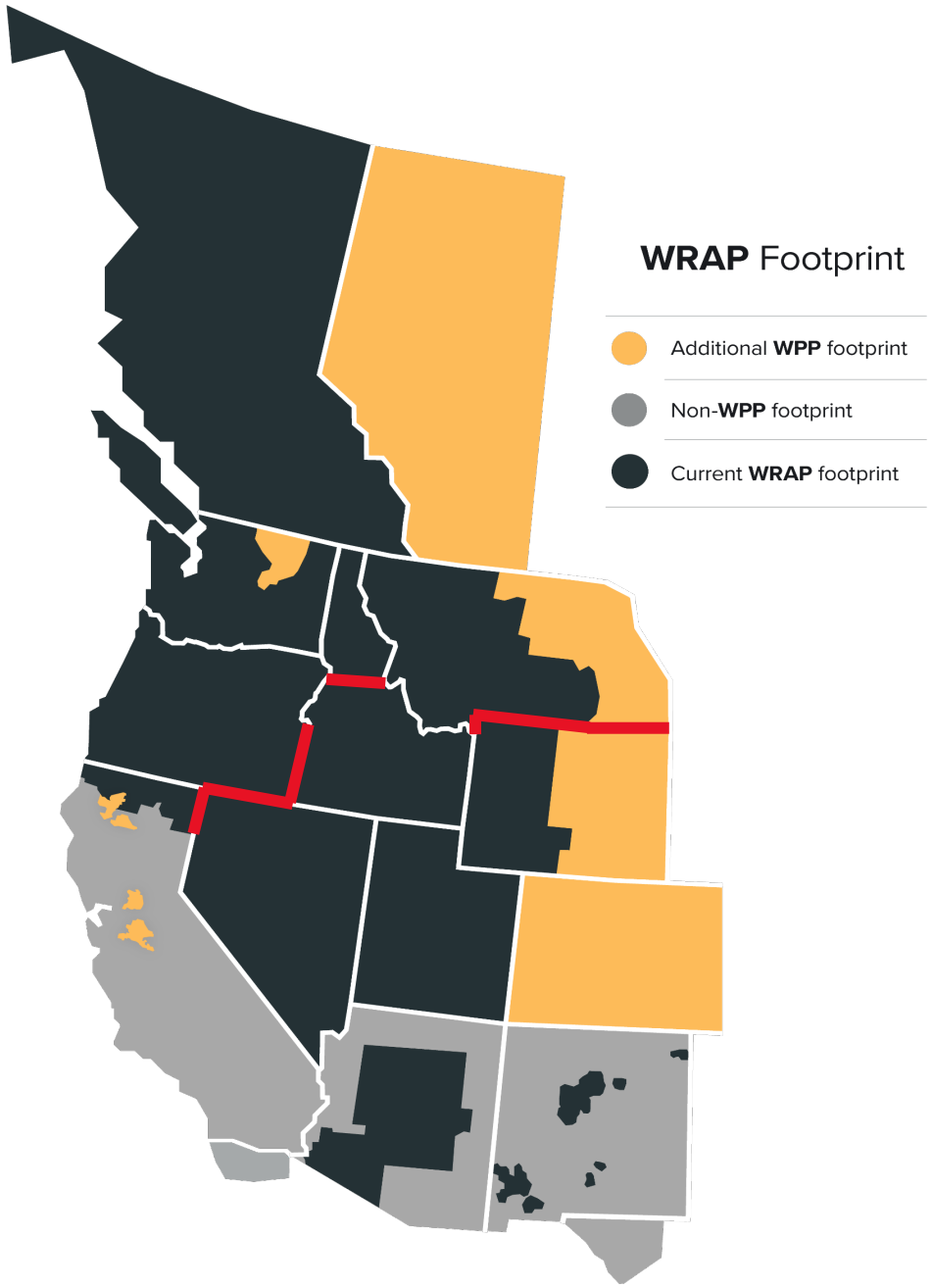


ESR ELCC

ESR at Incremental GW Installations

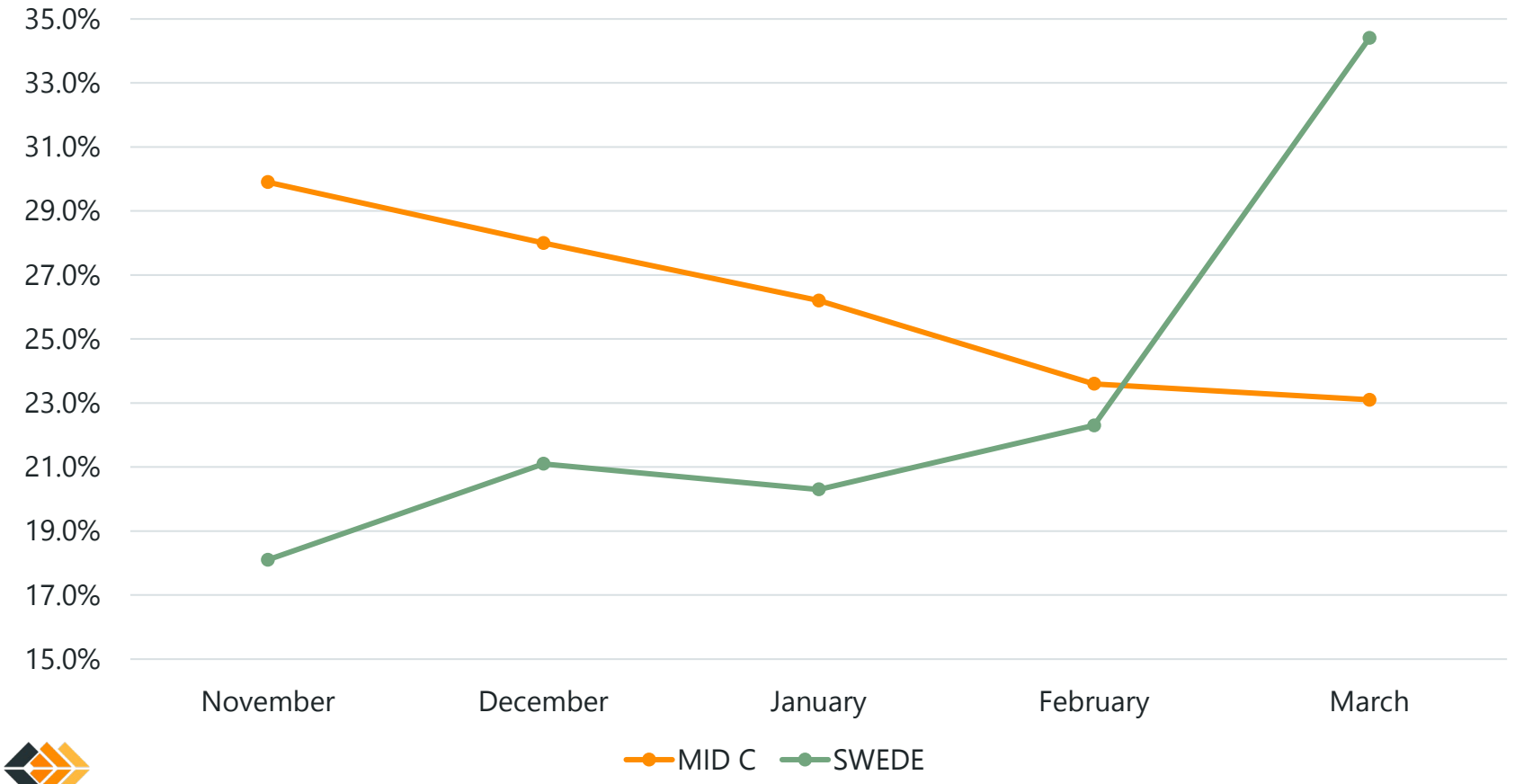


Run of River (RoR) Zones

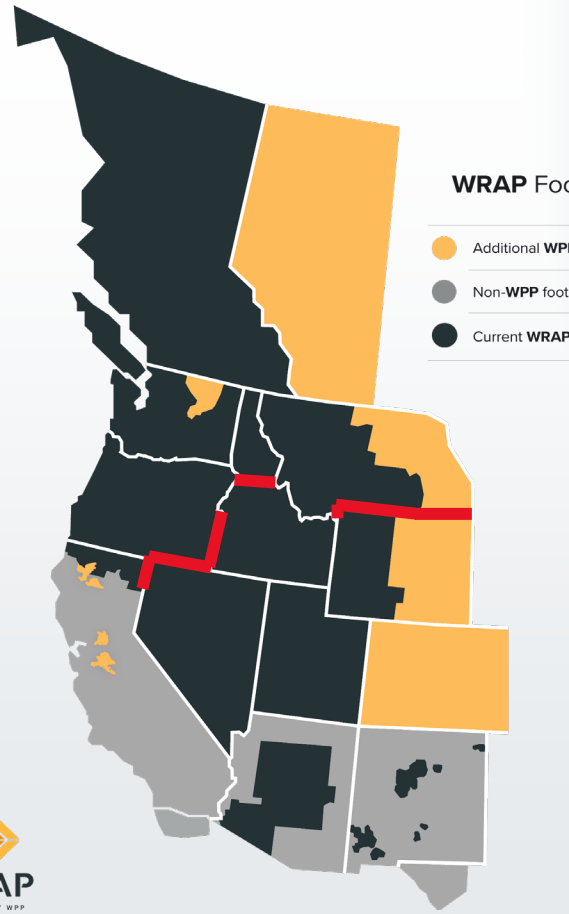


Subregion	Nameplate Capacity (MW)
MidC	**3,510**
SWEDE	**1,165**
Total	**4,675**

RoR QCC - Winter

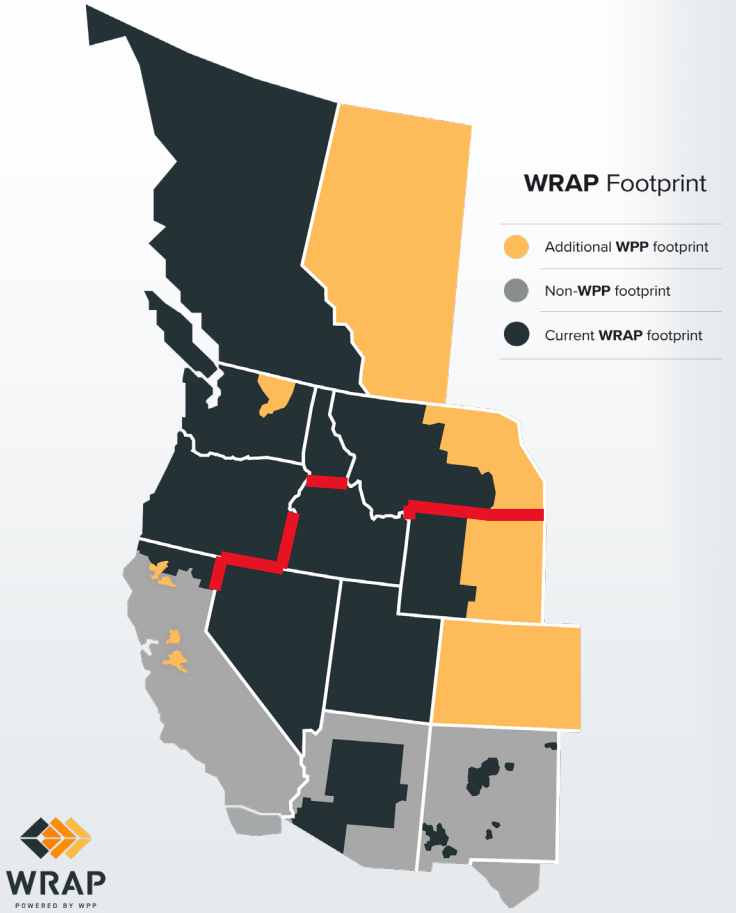


Thermal QCC



*Uses indicative values for resources that did not provide GADS data

Storage Hydro QCC MW



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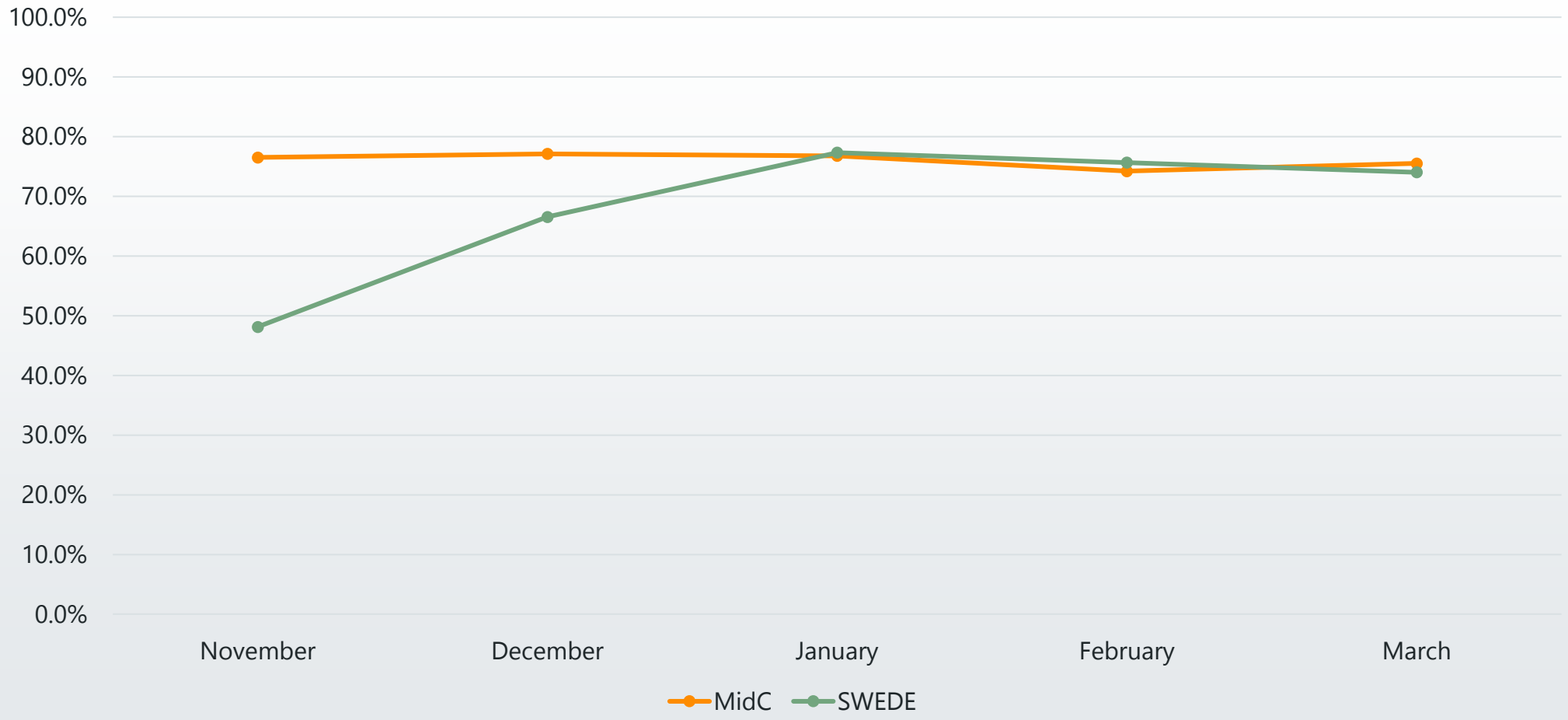
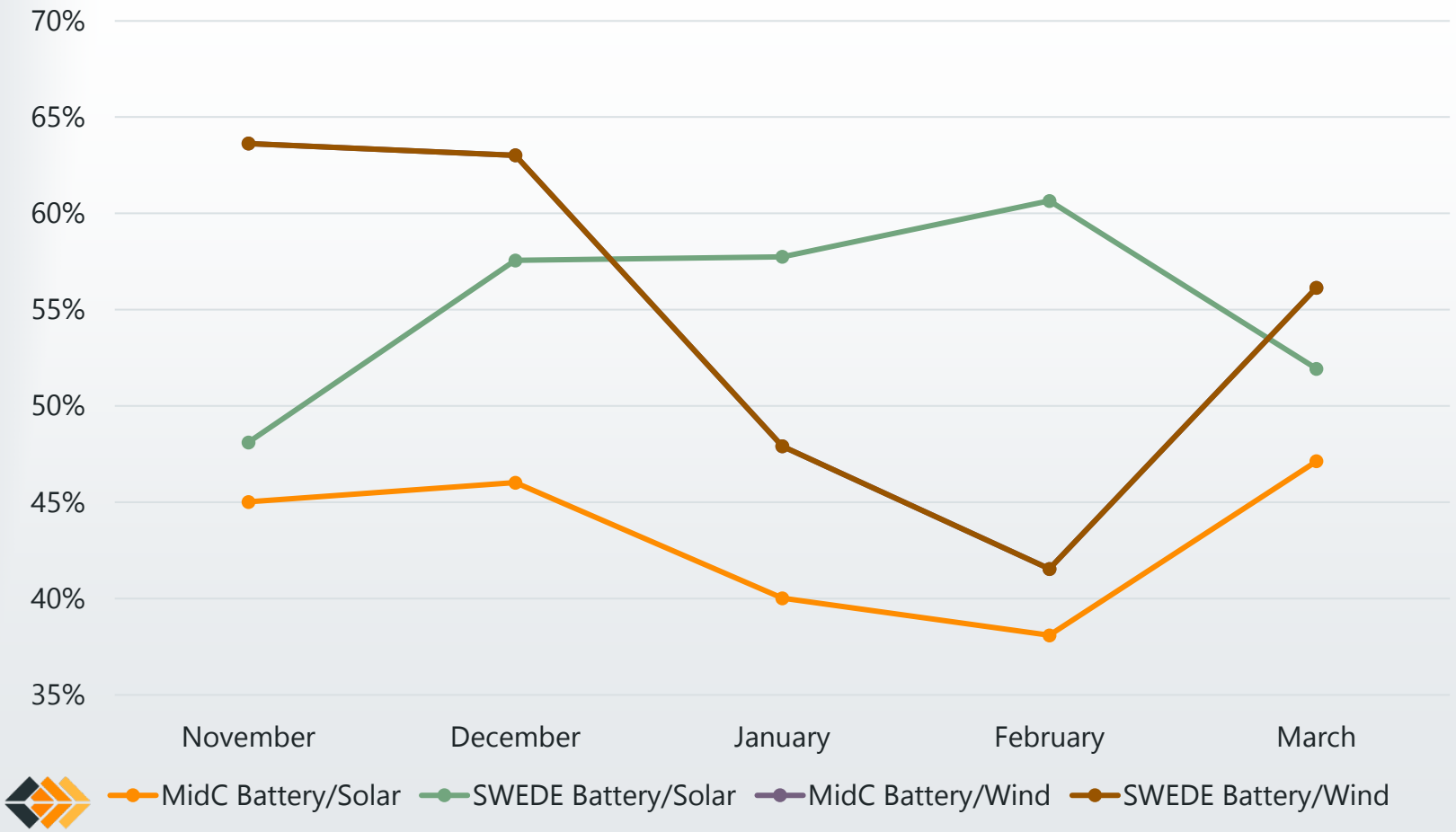
AVERAGE STORAGE HYDRO QCC



Hybrid Resource QCC



Number of installed pairings

	MidC	SWEDE
Battery/ Solar	4	38
Battery/ Wind	4	1

Note: SWEDE and MidC Battery/Wind have the same QCC %s and are concurrent lines on the chart

PRM Considerations

- Attempting to maintain 0.1 LOLE across the season
- Minimum of 0.01 LOLE in each individual month
- NCP load for a given month a significant factor in calculation of PRM (lower load months will have higher PRM value)
- PRMs calculated using updated P50 Peak Load Forecast methodology for Winters

Updated Winter P50 Peak Load Forecast Methodology

- Utilized a "Super Peak" Months methodology for Winter 2025-2026
  - December, January, and February use the same P50 Peak Load Forecast value calculated by taking the median of the maximums of the monthly peak load values – currently called the "Super Peak"
  - November and March use respective median monthly peak load values
  - LOLE study uses 40 years of historical data and currently includes a 1.1% growth factor

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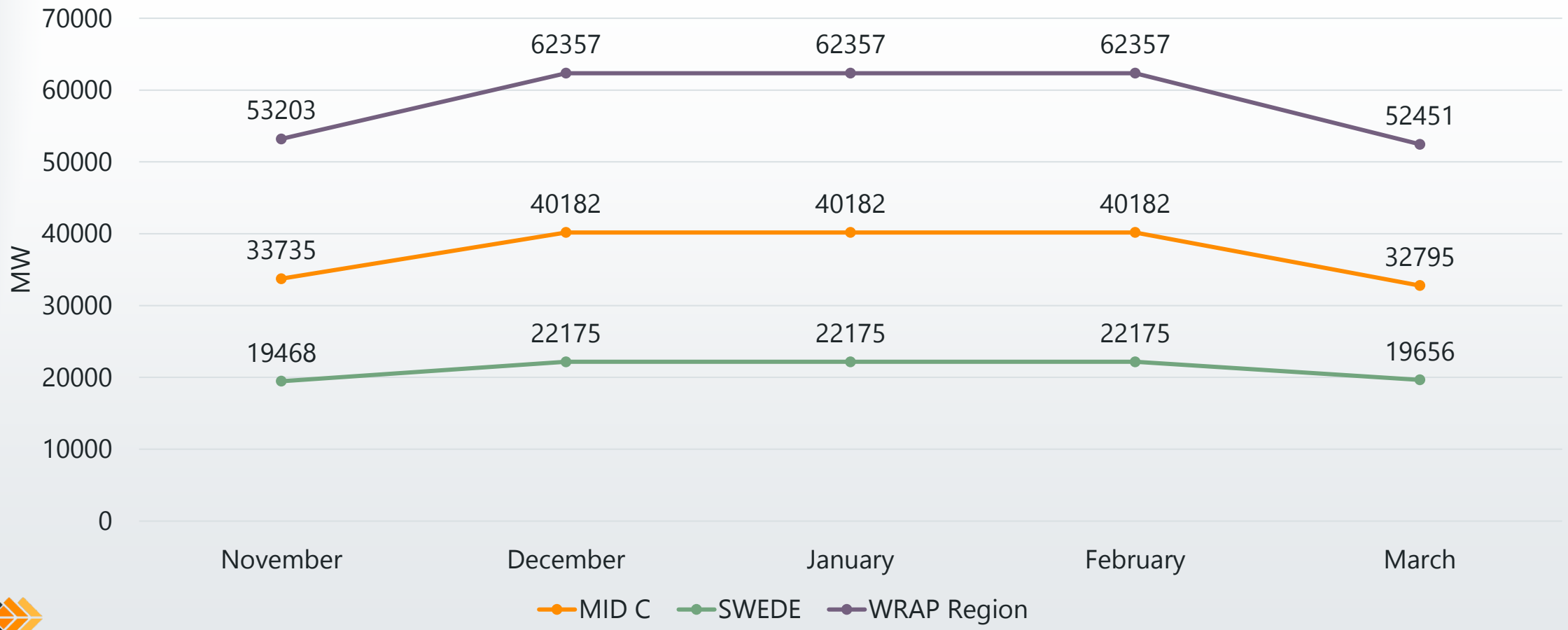
Peak Load


70000
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November
December
January
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March
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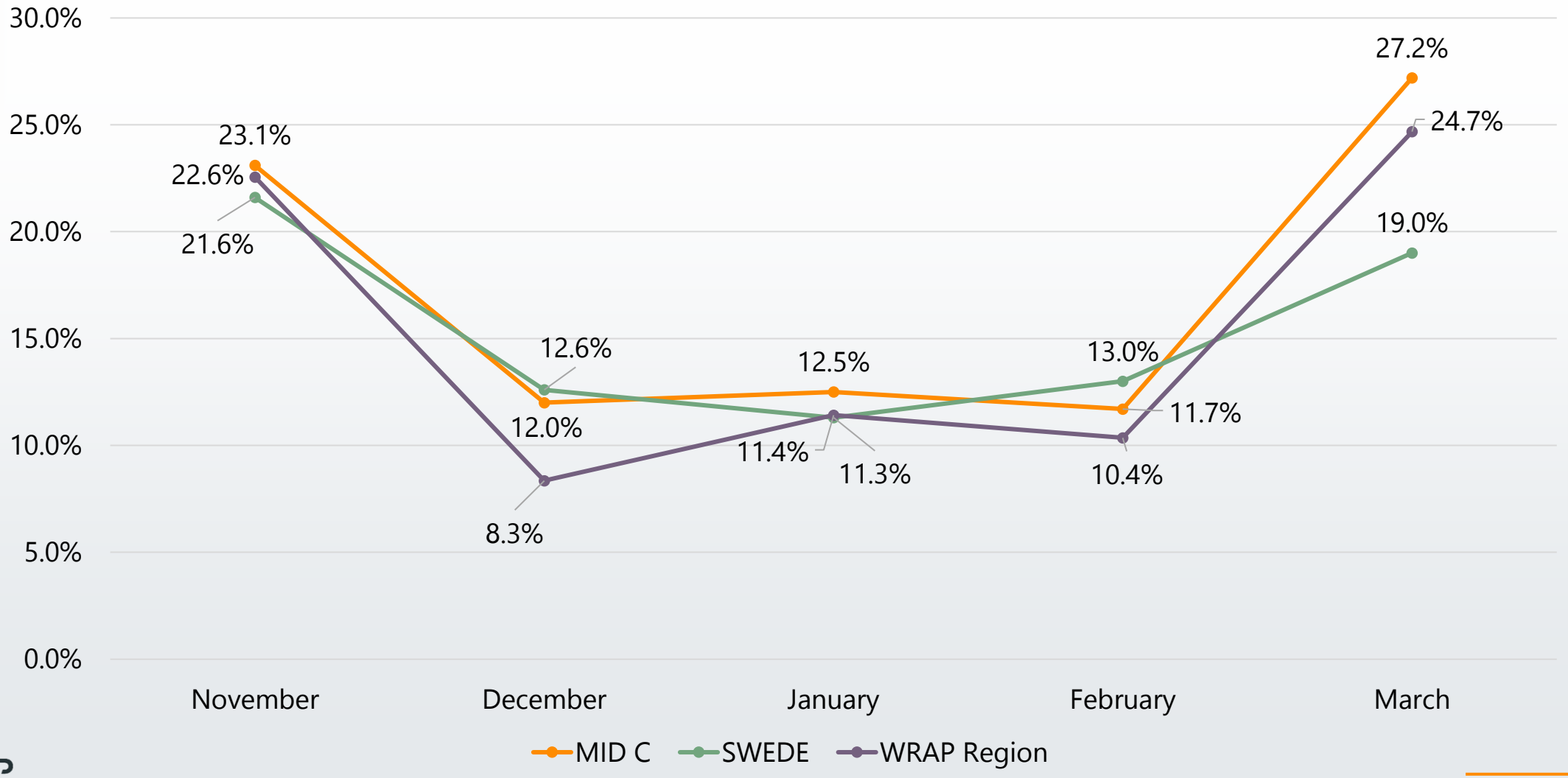
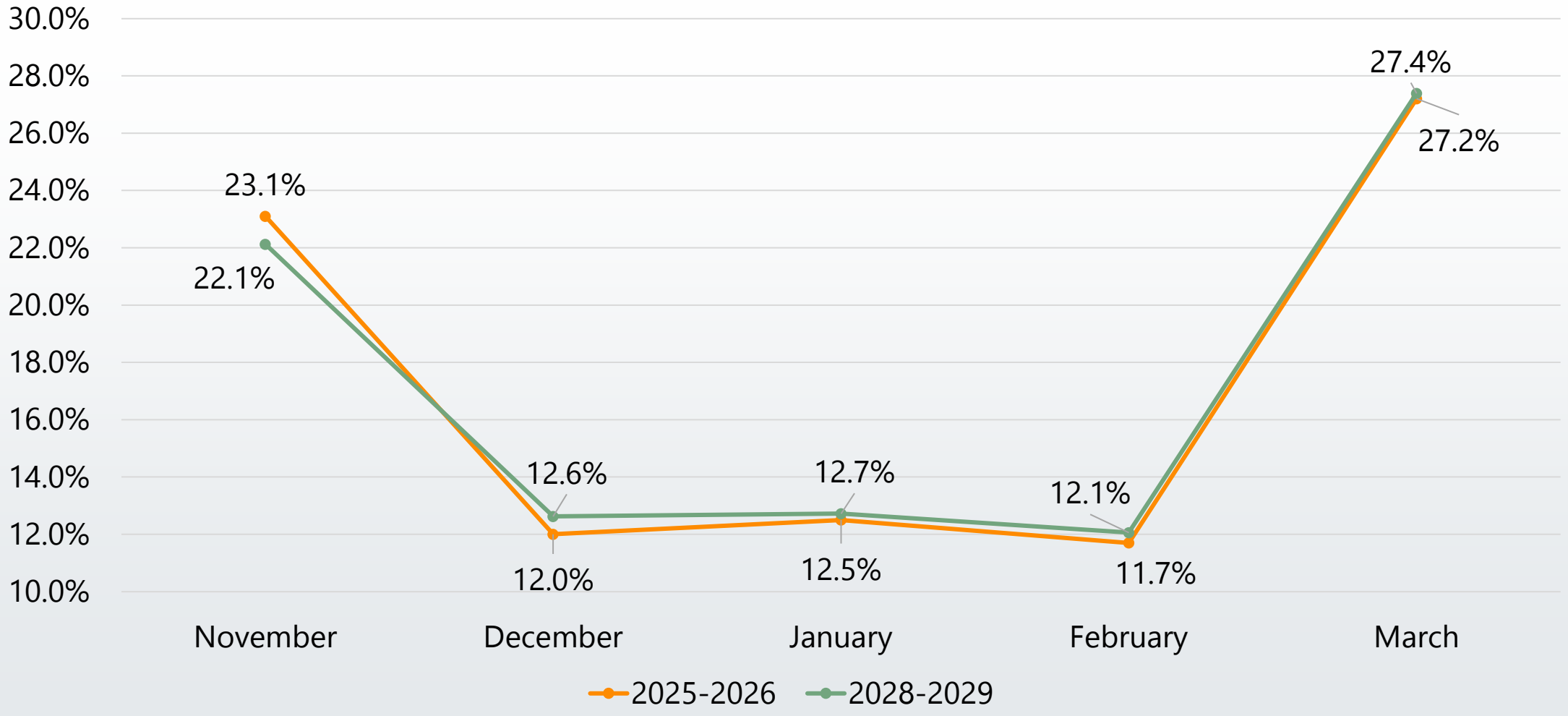
SWEDE
WRAP Region

PRM – Winter 2025-2026



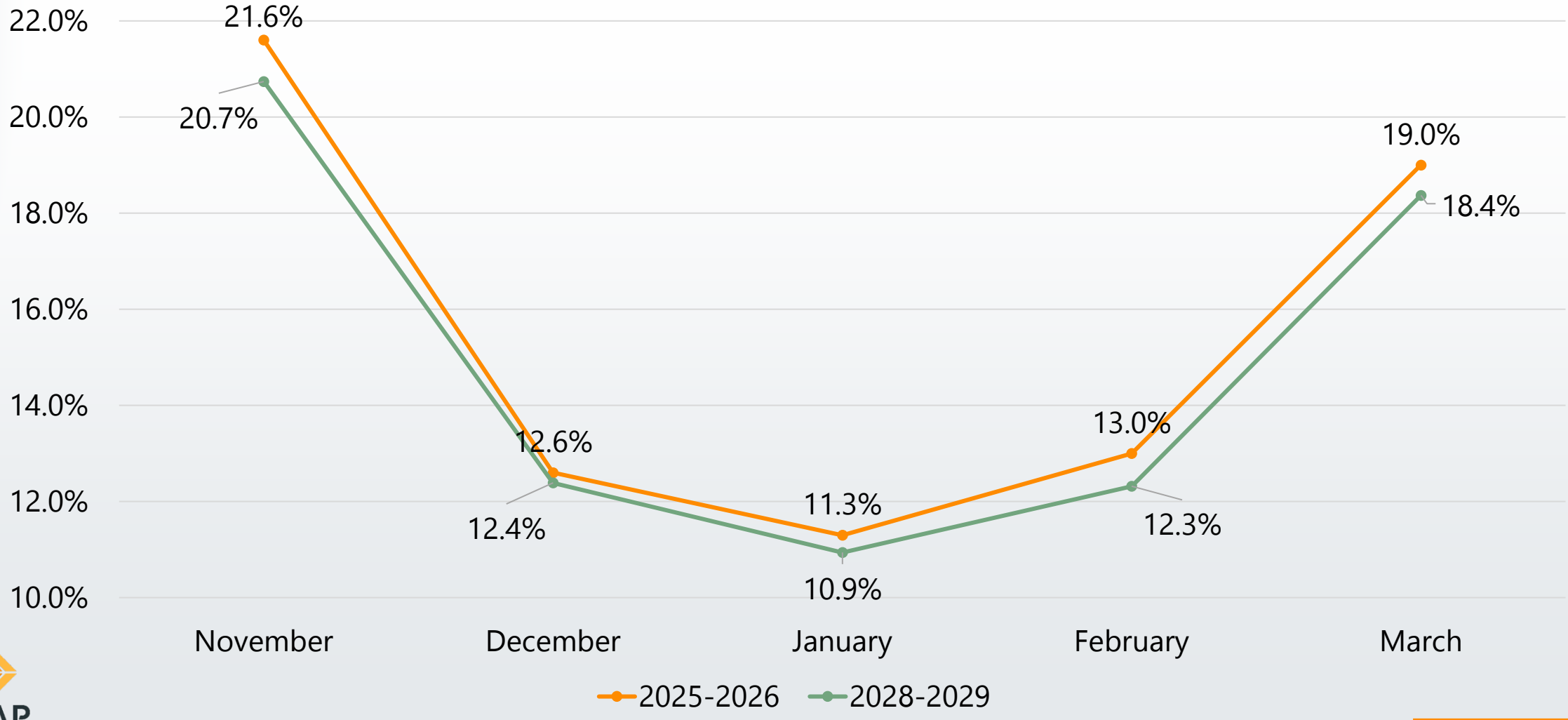
PRM – MidC Winter

2025-2026 and 2028-2029



PRM – SWEDE WINTER

2025-2026 AND 2028-2029



Thank You

For general inquiries or to be added to our mailing list:
wrap@westernpowerpool.org

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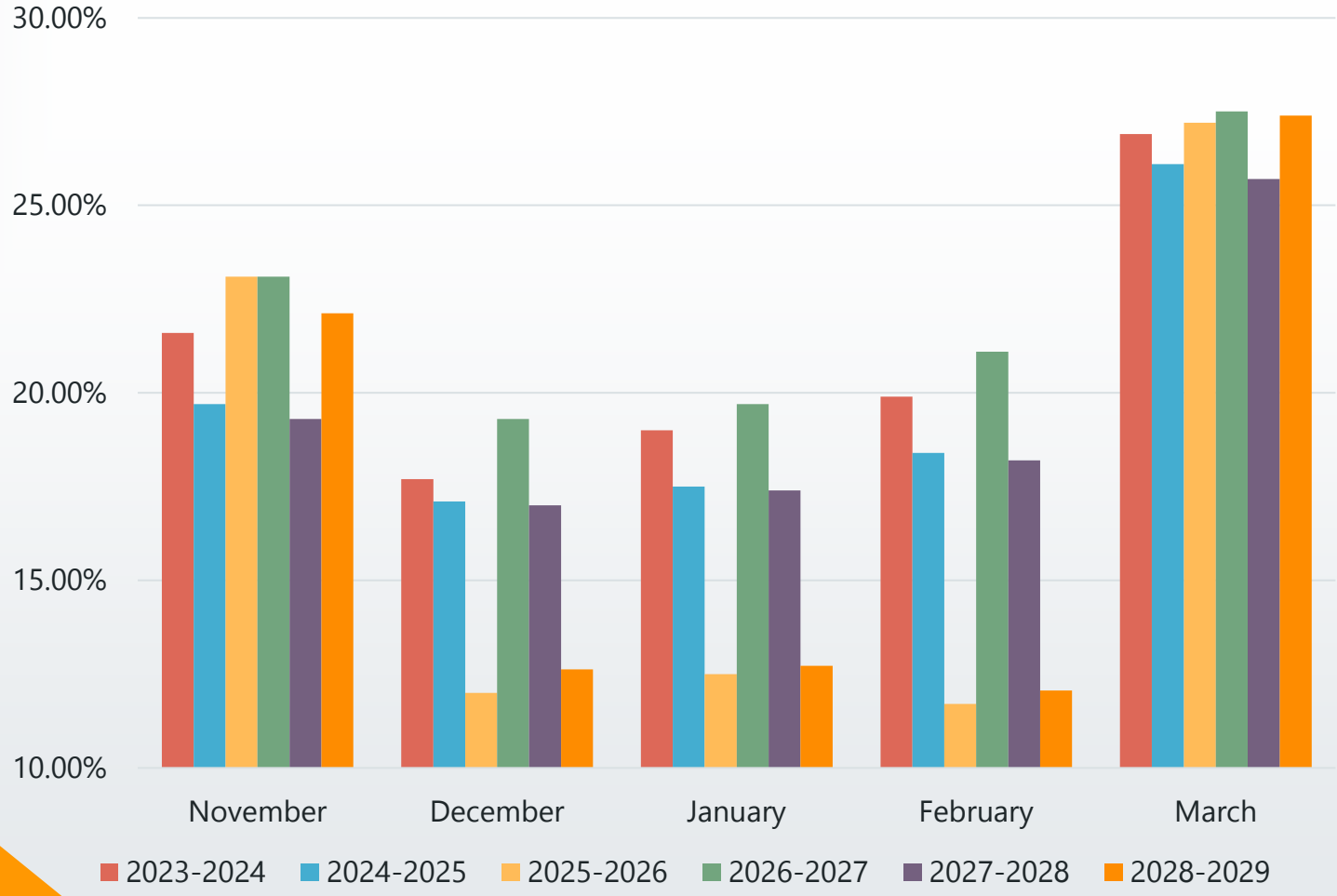
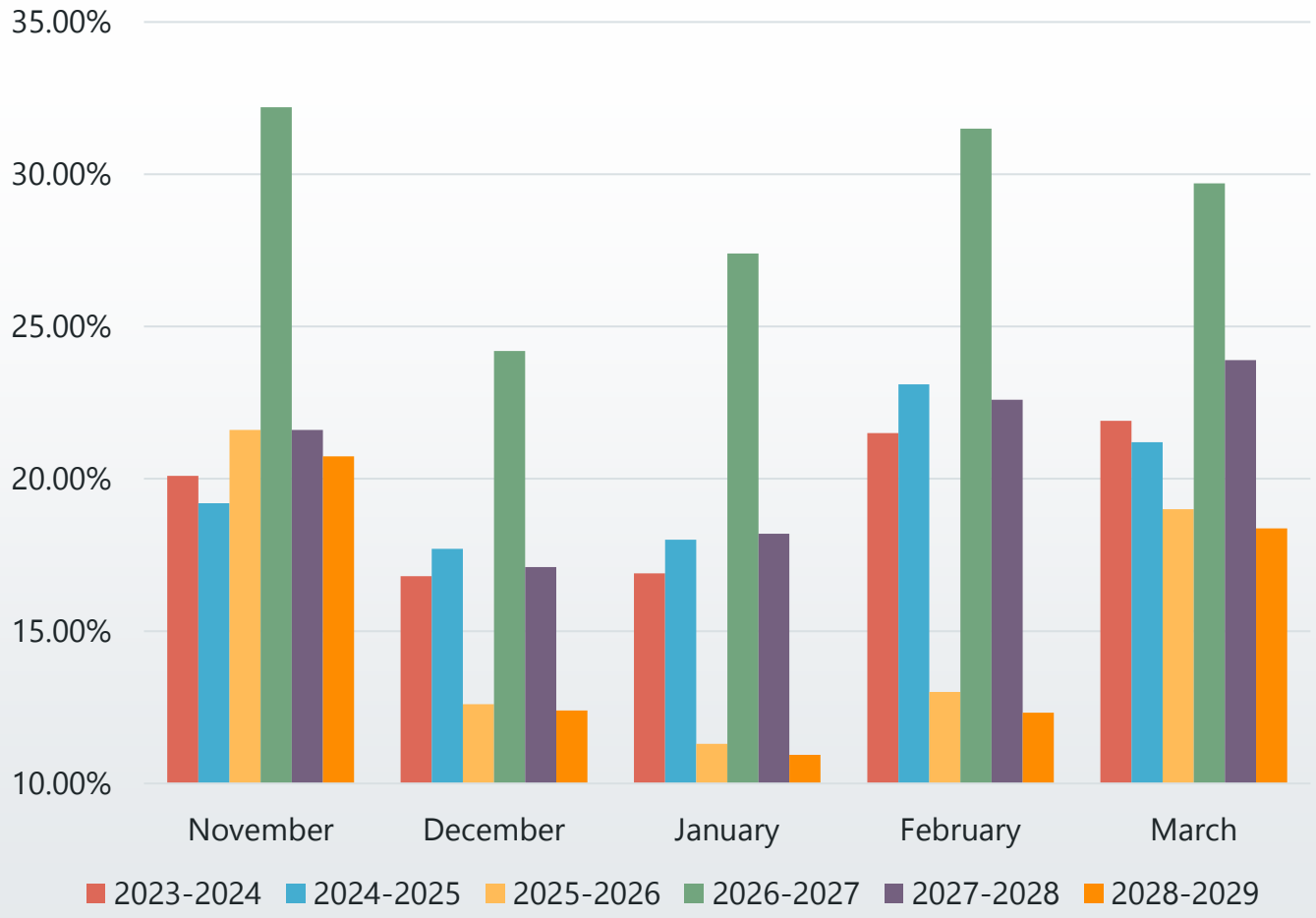
PRMs from Previous Winter Seasons

PRMs – MidC



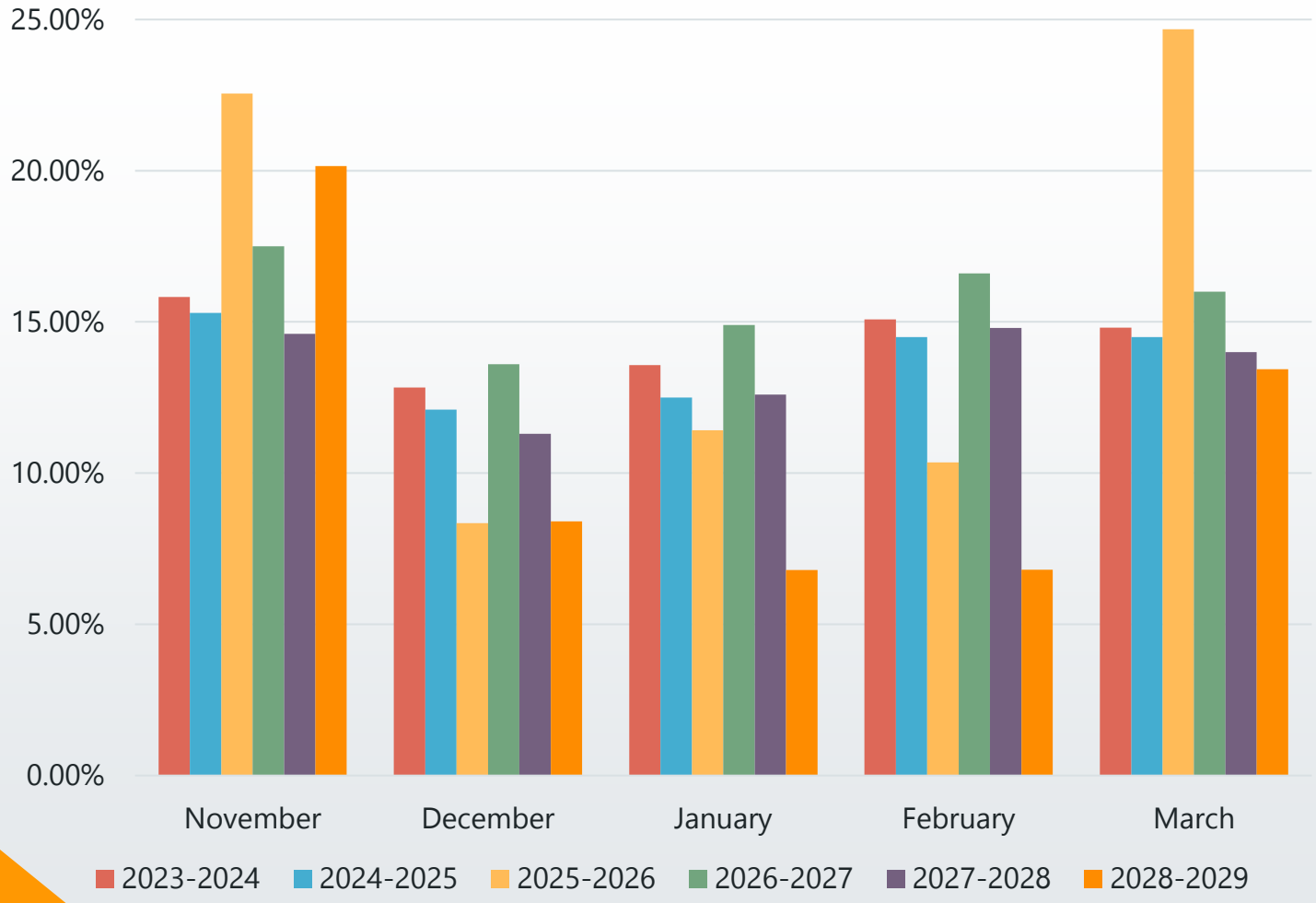
- 2025-2026 and 2028-2029 studies were performed the updated methodology discussed earlier
- 2026-2027, 2027-2028, and 2028-2029 are advisory only

PRMs – SWEDE



- 2026-2027 study was performed in 2022 with a smaller SWEDE footprint
- 2025-2026 and 2028-2029 studies were performed the updated methodology discussed earlier
- 2026-2027, 2027-2028, and 2028-2029 are advisory only

PRMs – WRAP Region



- 2023-2024 and 2026-2027 studies were done in 2022 with a slightly different footprint different methodology
- 2026-2027 and 2027-2028 are advisory only