

WESTERN RESOURCE ADEQUACY PROGRAM

Review of preliminary, non-binding WRAP regional data for the current participating footprint for the Summer 2025 and advisory data for the Summer 2028 season

January 31, 2024

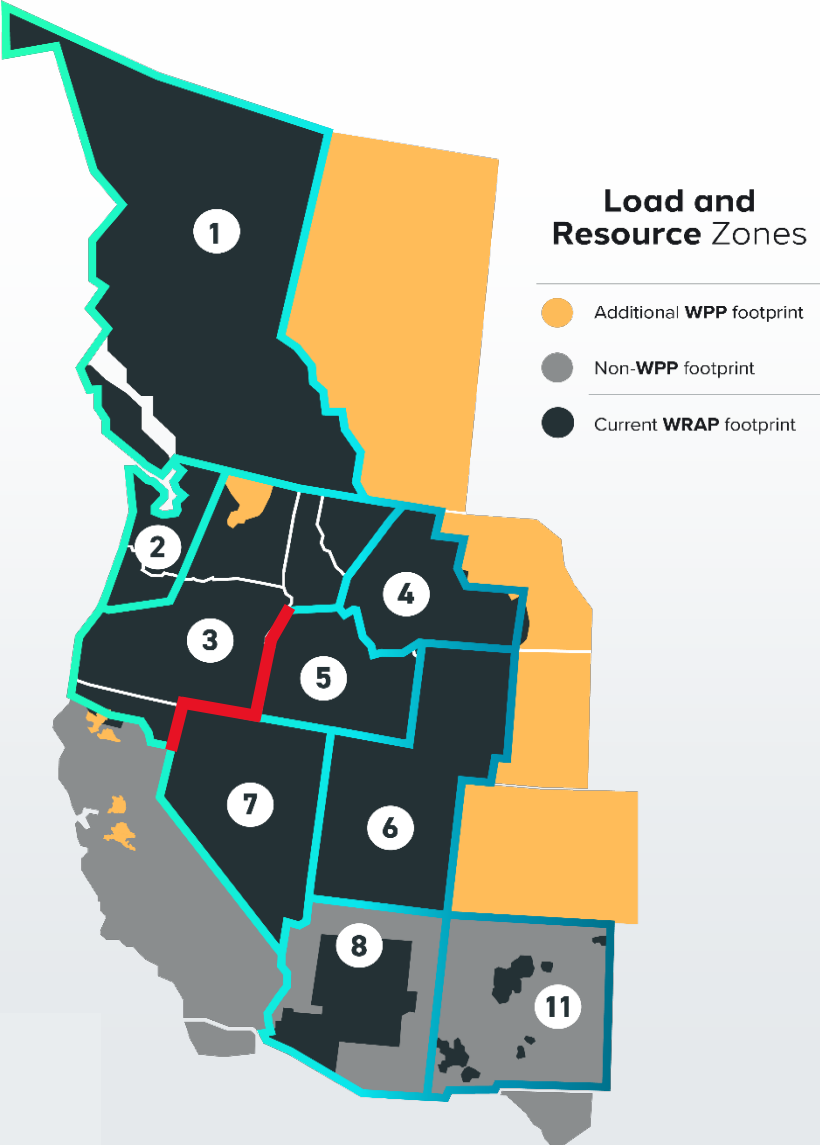
TODAY'S OBJECTIVES

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

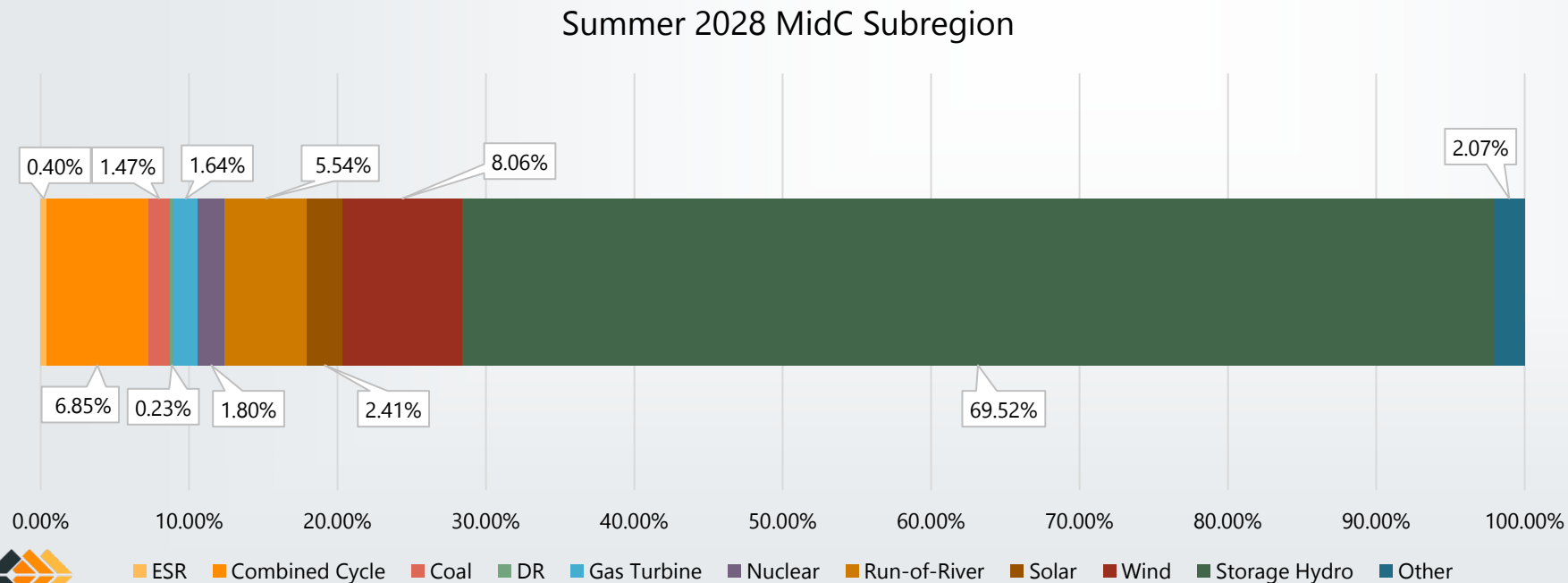
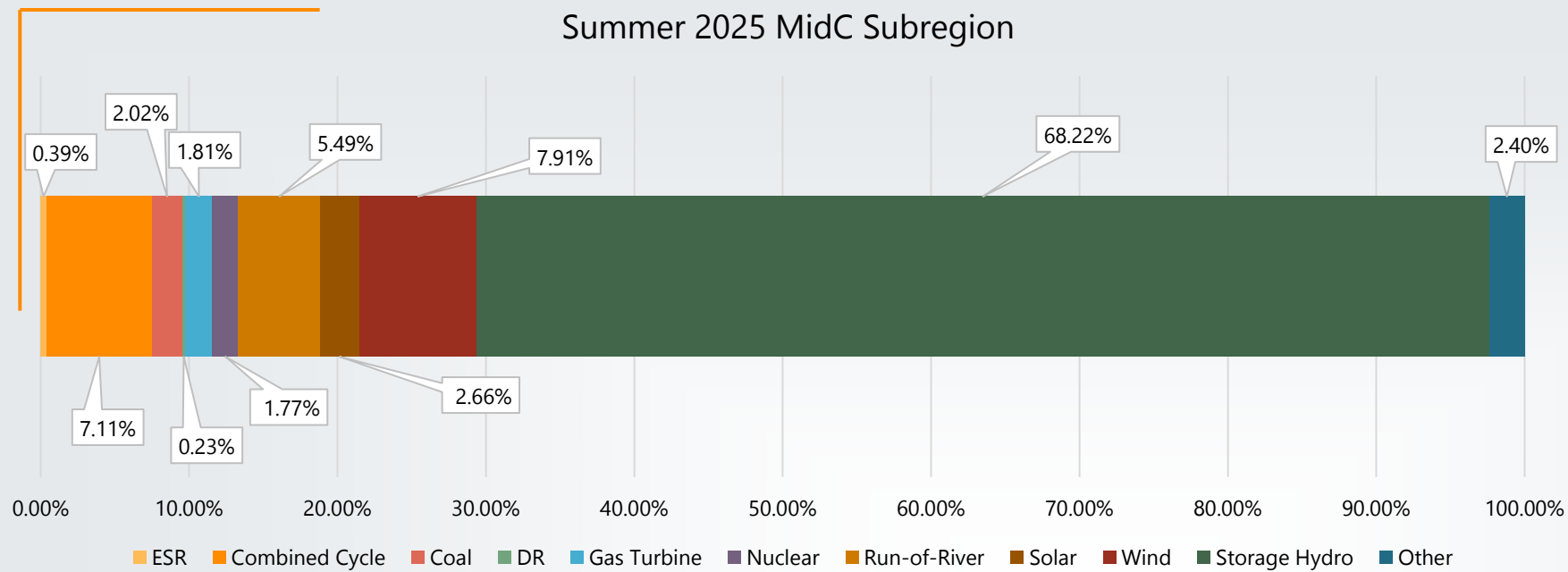
BEFORE WE BEGIN

- » Modeling provided utilizes WRAP program design, assuming full binding implementation of the WRAP as designed
 - Metrics assume diversity benefit and a level of forward procurement on aggregate that is not presently expected without implementation of the WRAP
- » Modeling was performed based on the WRAP footprint as of late 2023
 - 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 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 study will be available to the WRAP footprint
 - Planned outages are not considered; they will be managed by LREs from their surplus

LOAD AND RESOURCE ZONES



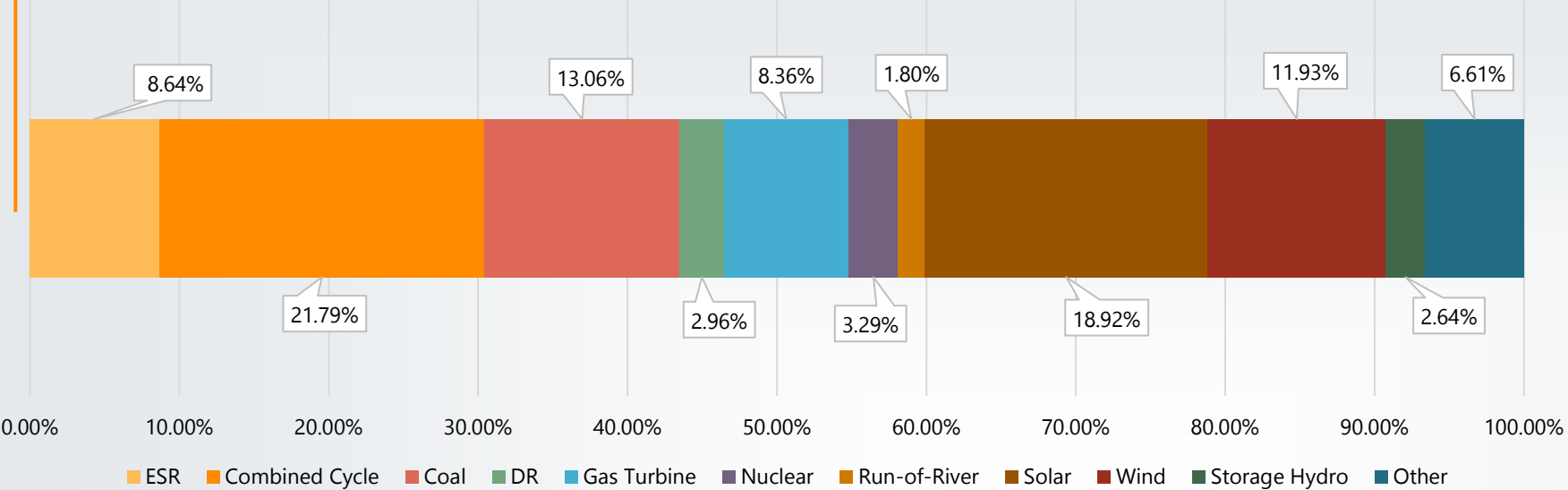
Subregion	Zone	Geographical Description
MidC	Zone 1	British Columbia
	Zone 2	West of Cascades
	Zone 3	East of Cascades
	Zone 4	NorthWestern
SWEDE	Zone 5	Idaho Power
	Zone 6	PacifiCorp East
	Zone 7	Nevada
	Zone 8	Arizona
	Zone 11	New Mexico



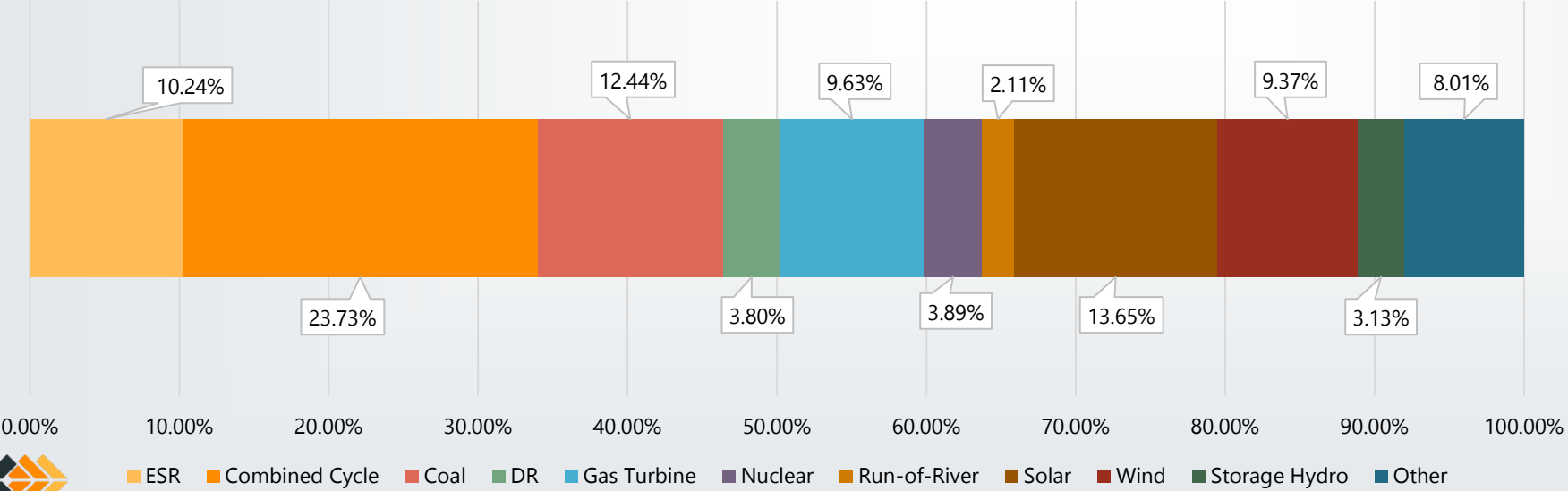
MidC SUBREGION SUMMERS

Percentage

Summer 2025 SWEDE Subregion



Summer 2028 SWEDE Subregion



SWEDE SUBREGION SUMMERS

Percentage

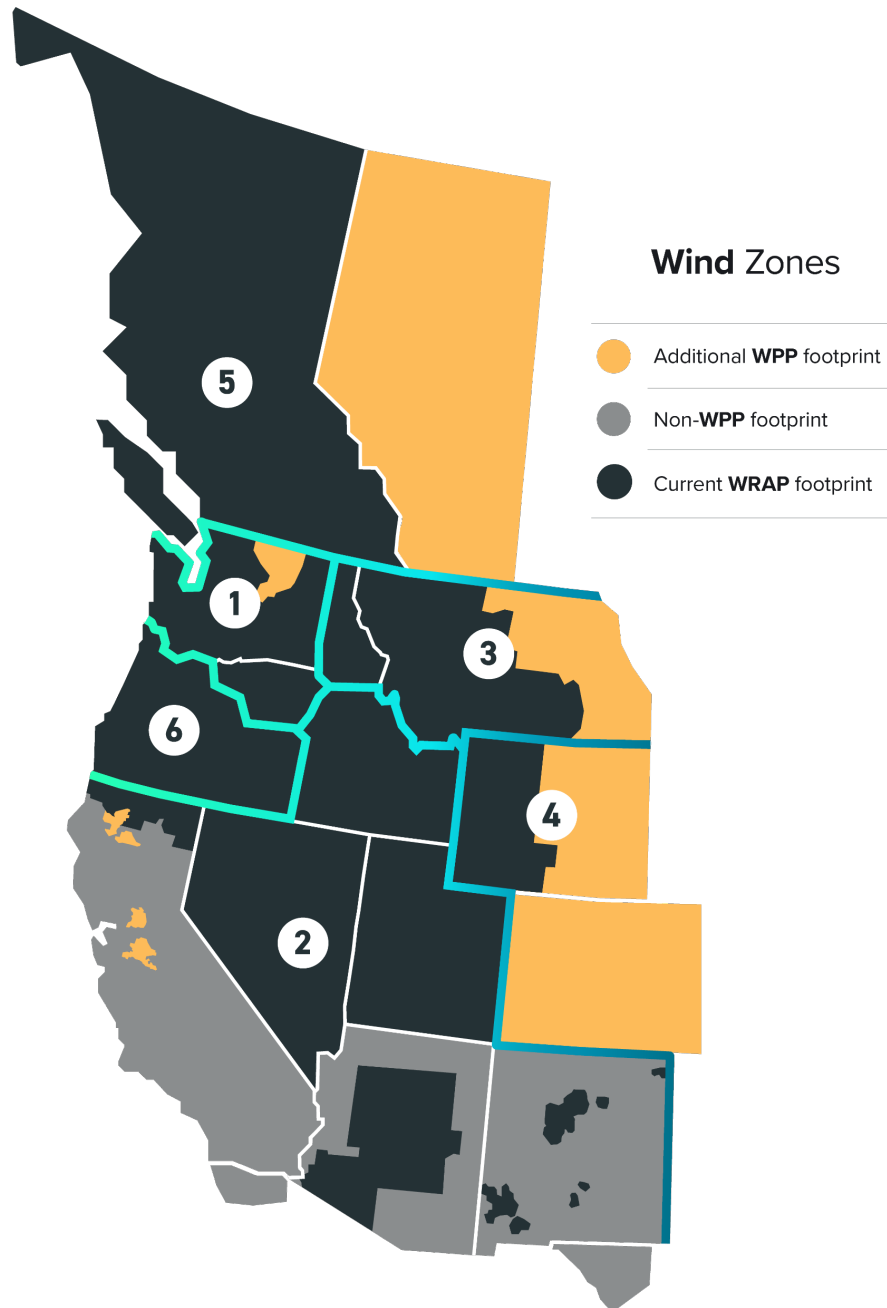
KEY REMINDERS

- » Not all resources shown in the preceding slides can be assumed to be available to the WRAP footprint for resource adequacy purposes
 - Planned outages are not considered; they will be managed by LREs from their 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 motivates participants to acquire the necessary capacity
 - Cannot assume this has yet happened or will happen without binding implementation of WRAP

KEY TAKEAWAYS

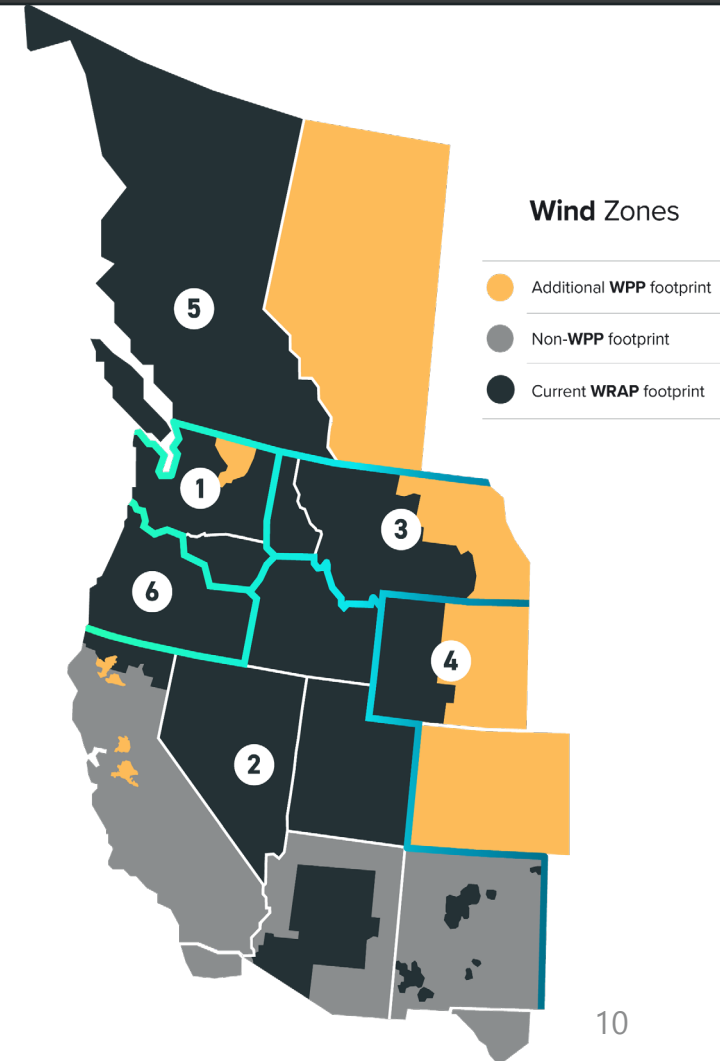
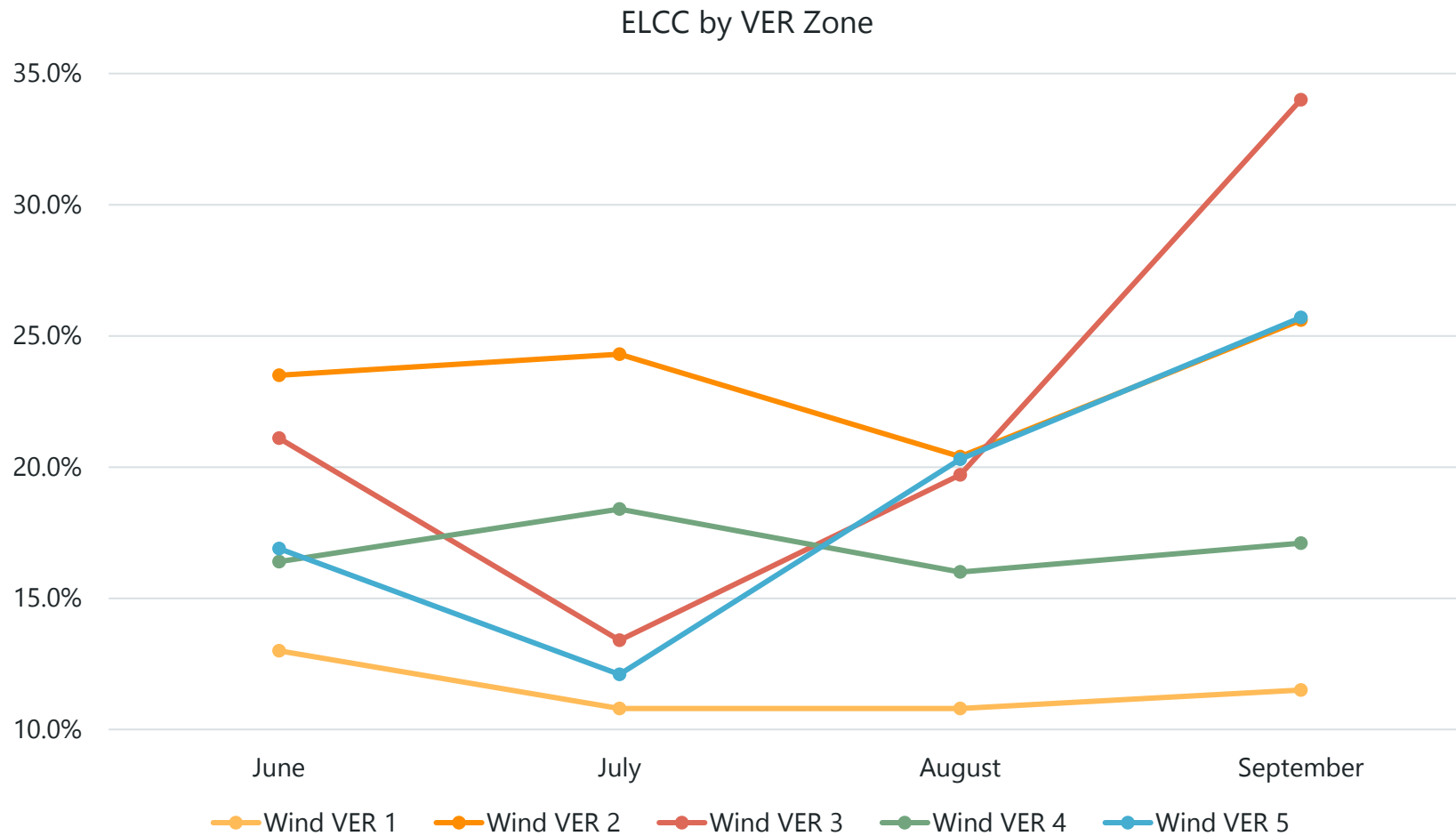
- » Northwest has planned resource retirements which can impact capacity available to meet 1 event day-in-10 year LOLE
- » Southwest is seeing significant increase in resources, particularly VERS, with very aggressive planned build targets to maintain 1 event day-in-10 year LOLE

WIND ZONES



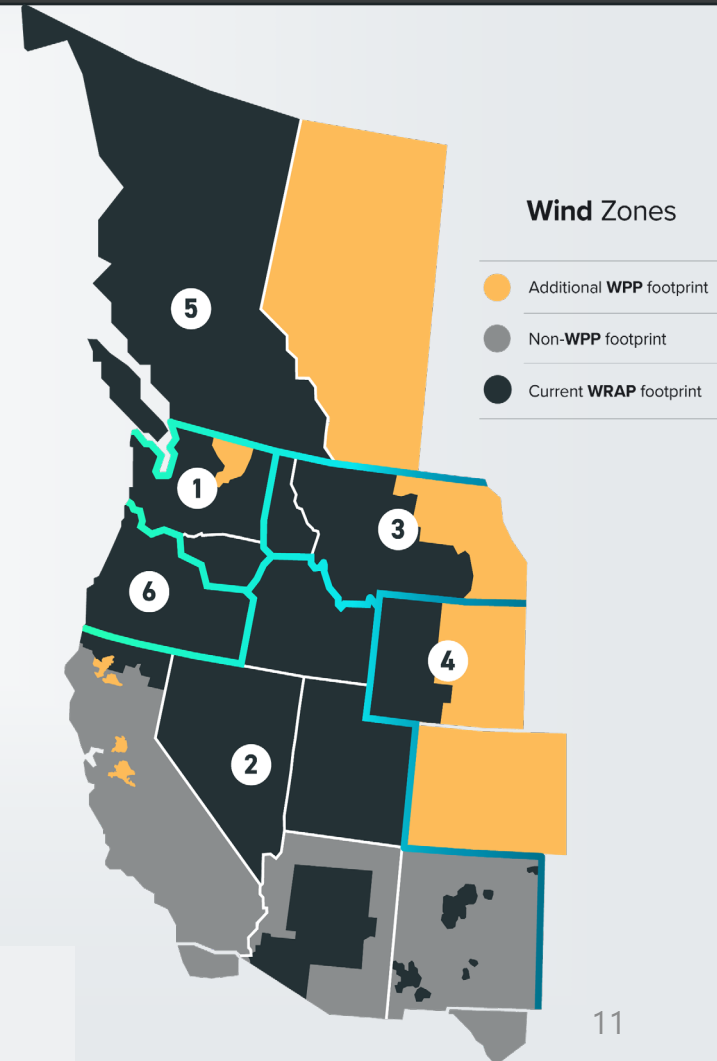
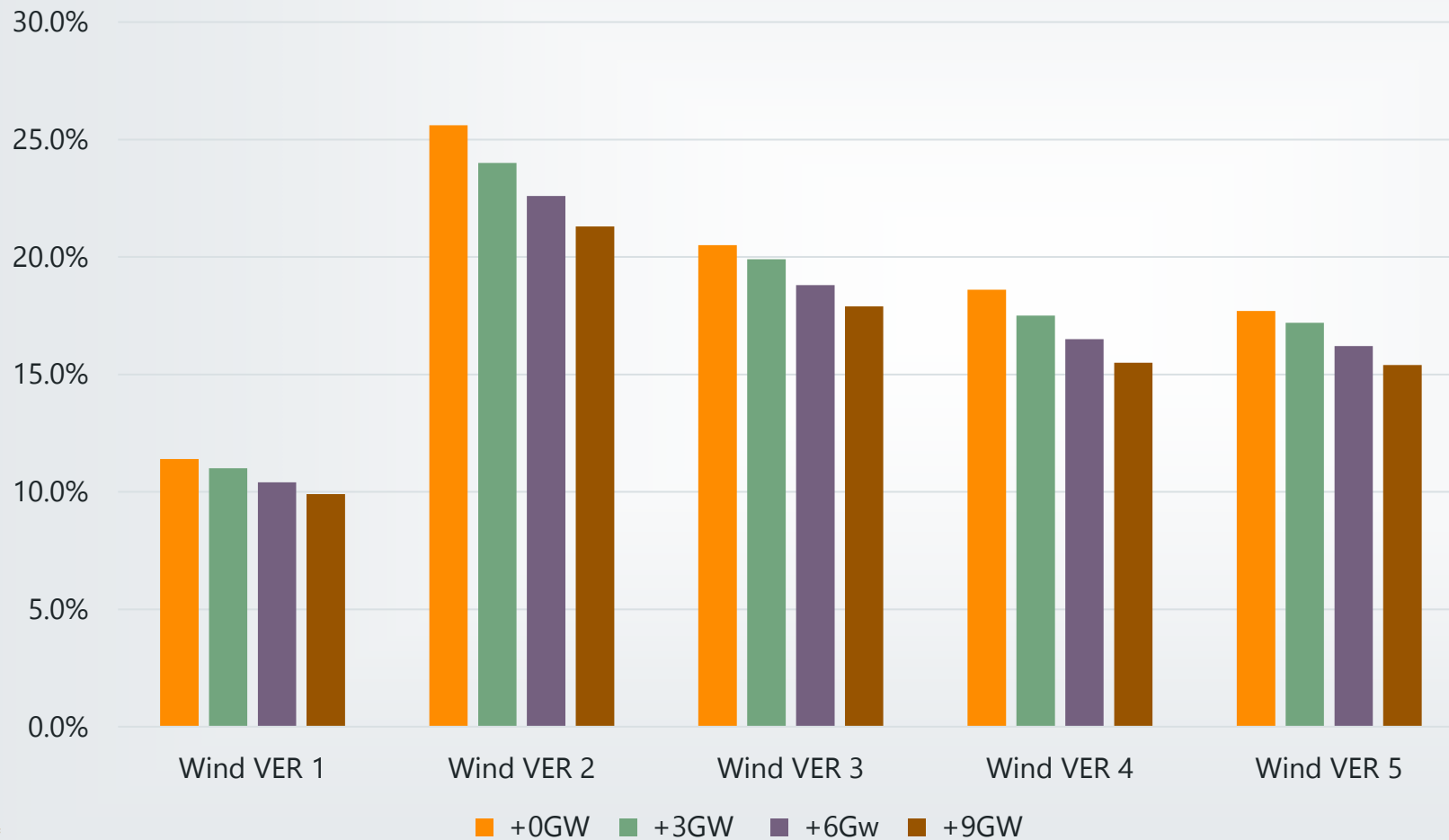
Zone	Nameplate Capacity (MW)
Wind VER1	4,991
Wind VER2	2,989
Wind VER3	1,323
Wind VER4	2,745
Wind VER5	747
Wind VER6	No wind
Total	12,795

WIND ELCC - SUMMER

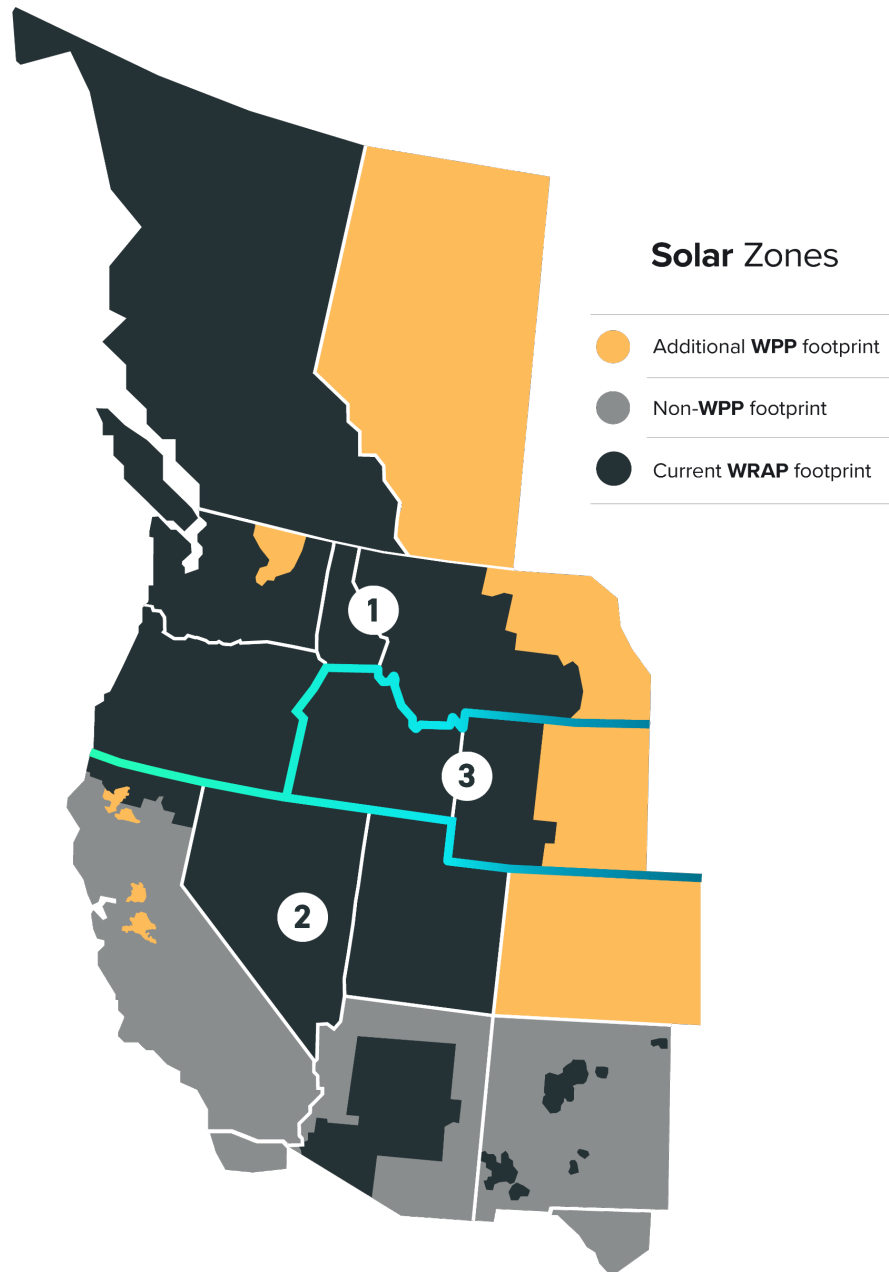


WIND ELCC

WIND AT INCREMENTAL GW INSTALLATIONS

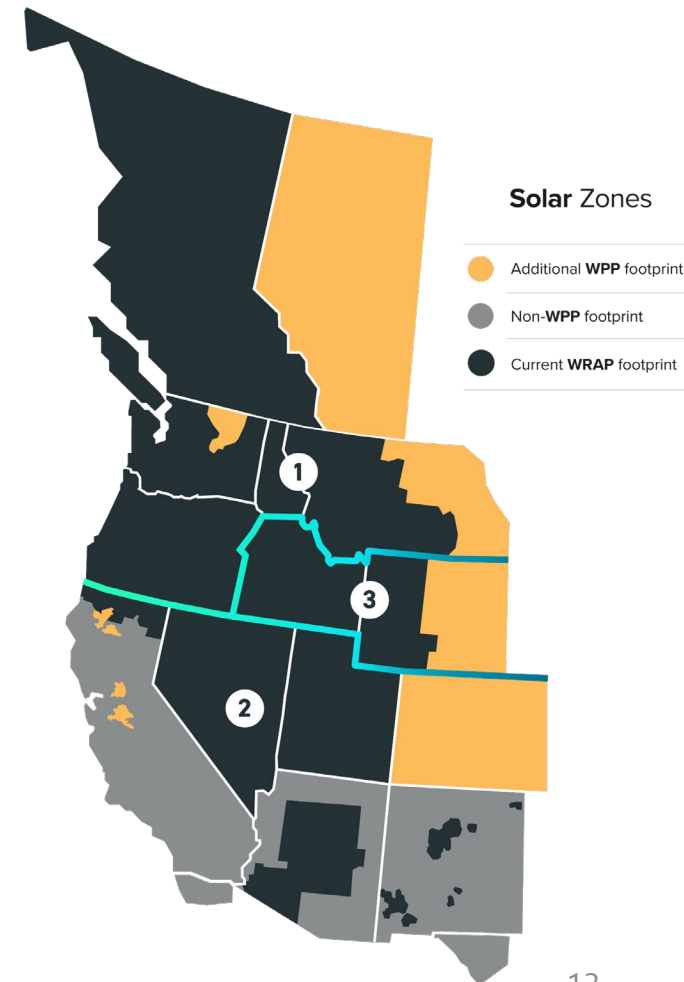
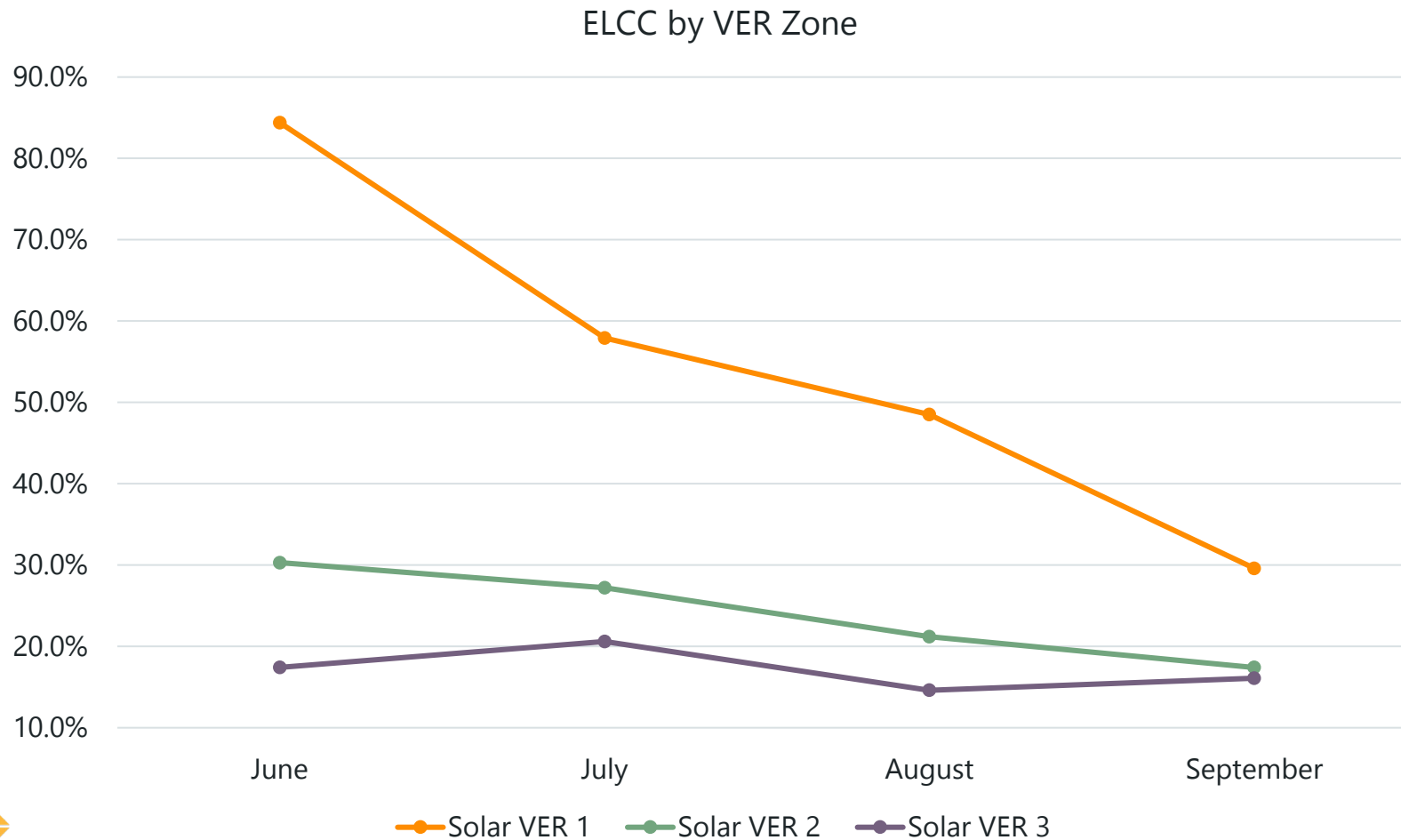


SOLAR ZONES



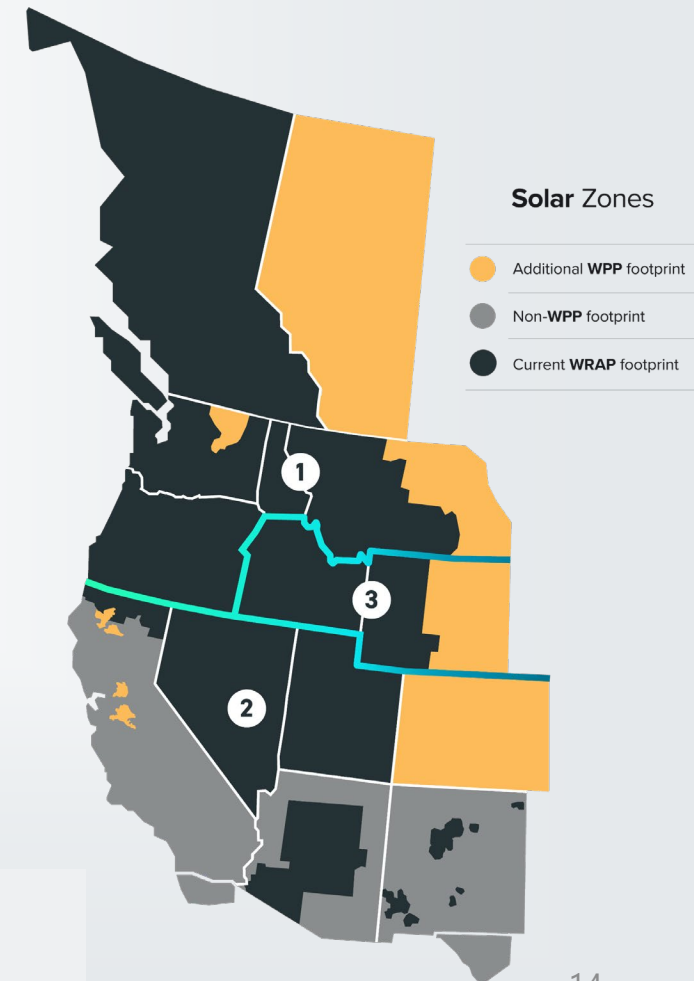
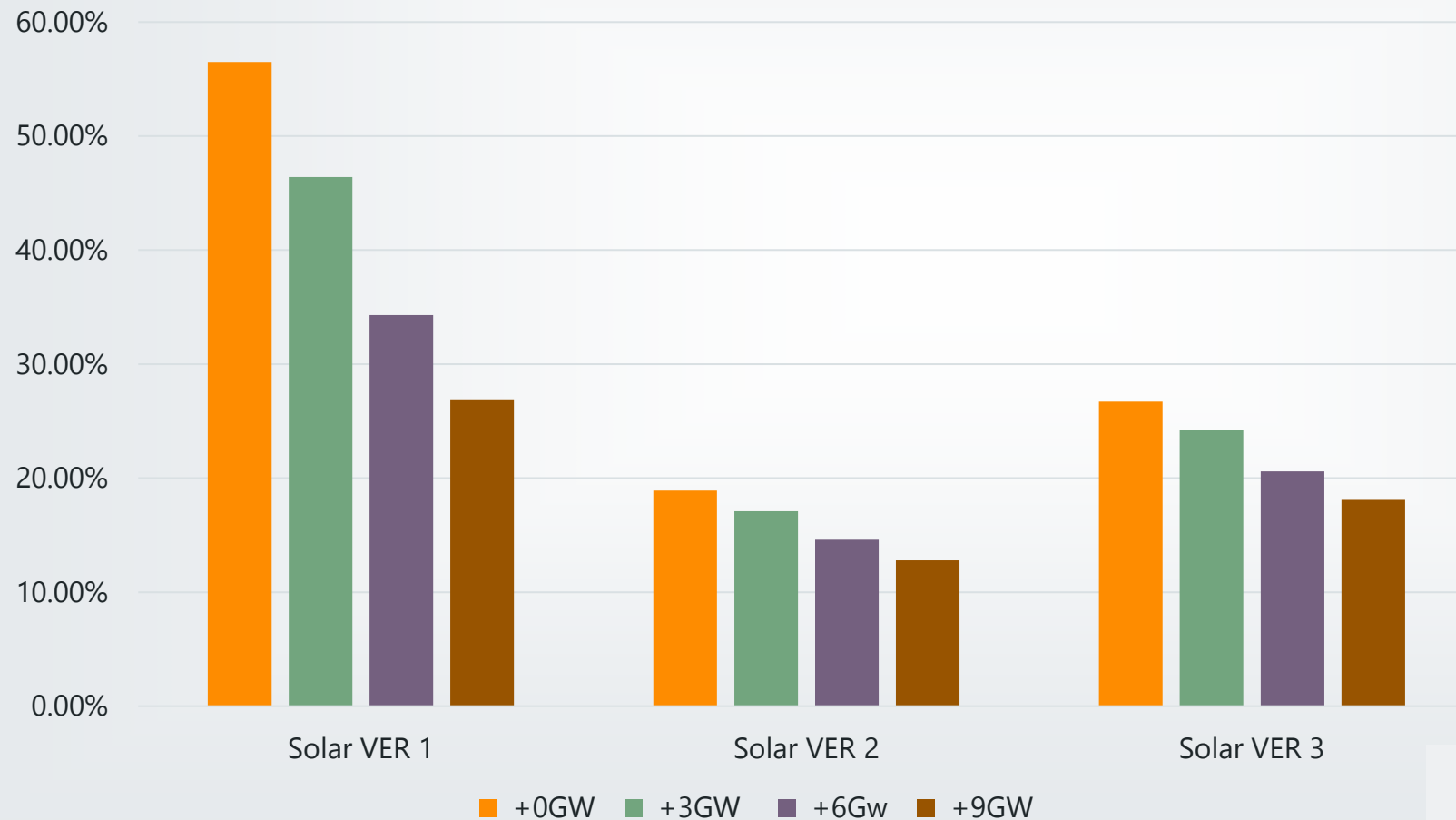
Zone	Nameplate Capacity (MW)
Solar VER1	1,700
Solar VER2	11,373
Solar VER3	889
Total	13,962

SOLAR ELCC - SUMMER

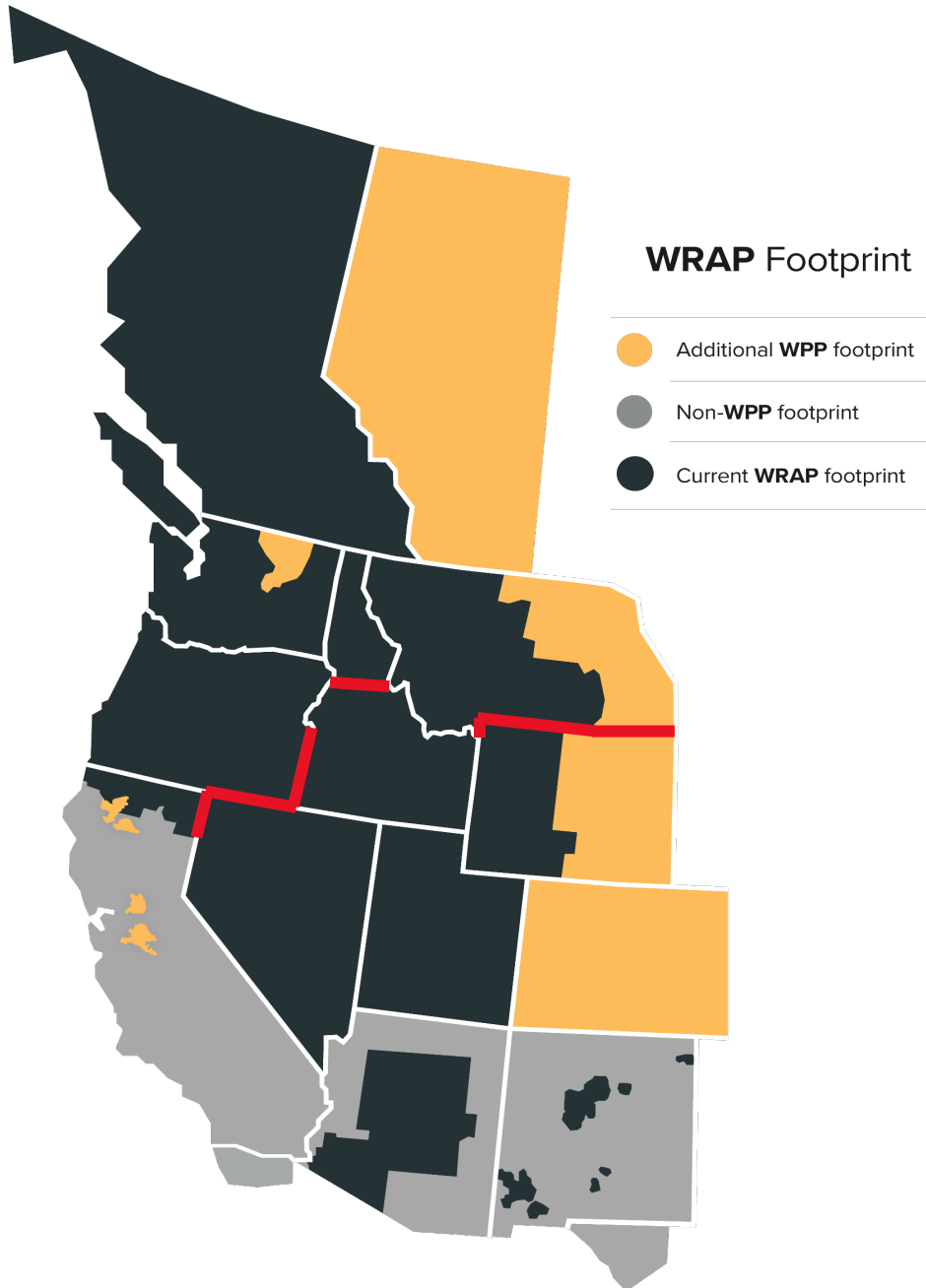


SOLAR ELCC

SOLAR AT INCREMENTAL GW INSTALLATIONS

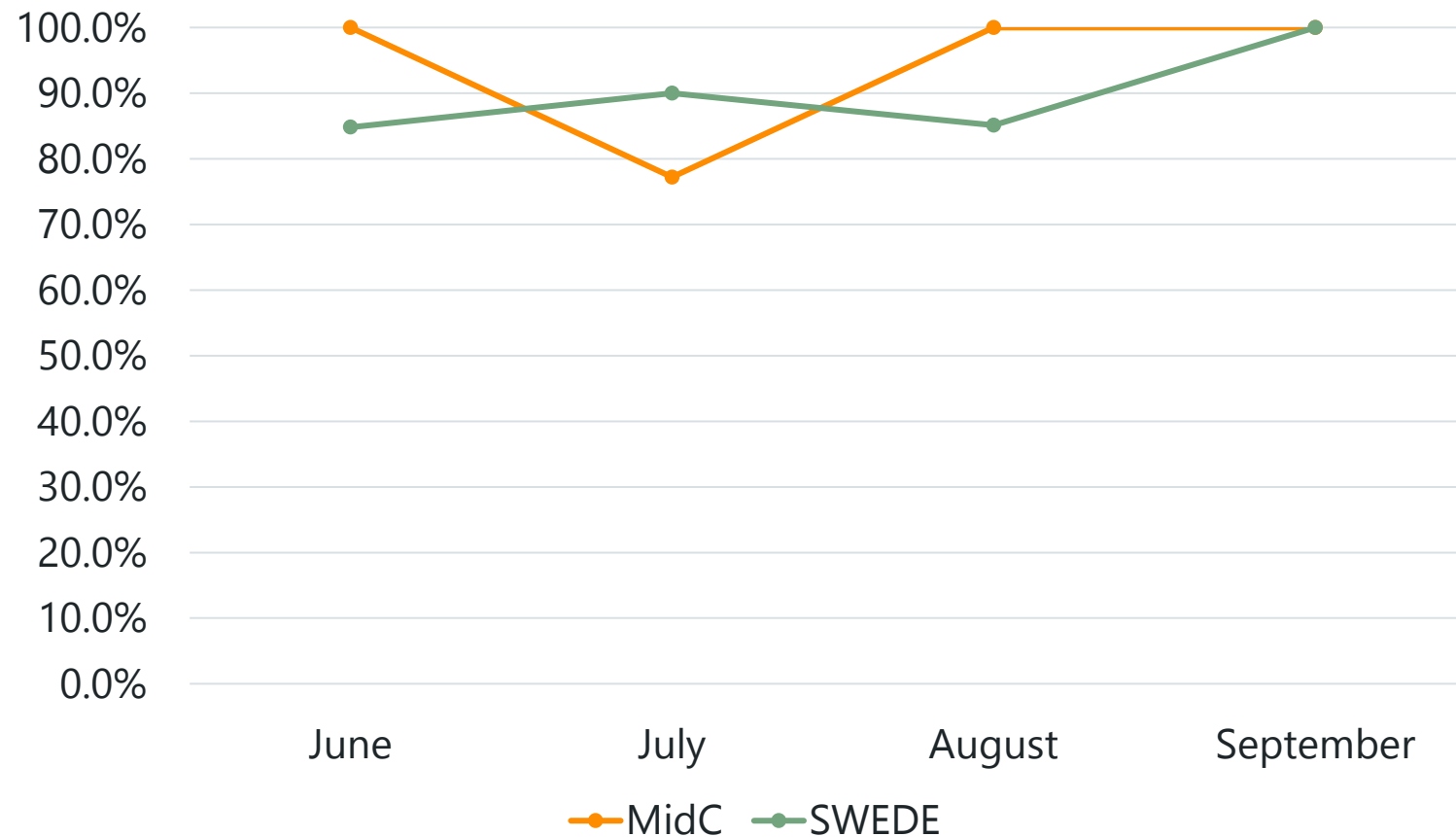


ENERGY STORAGE RESOURCE (ESR) ZONES



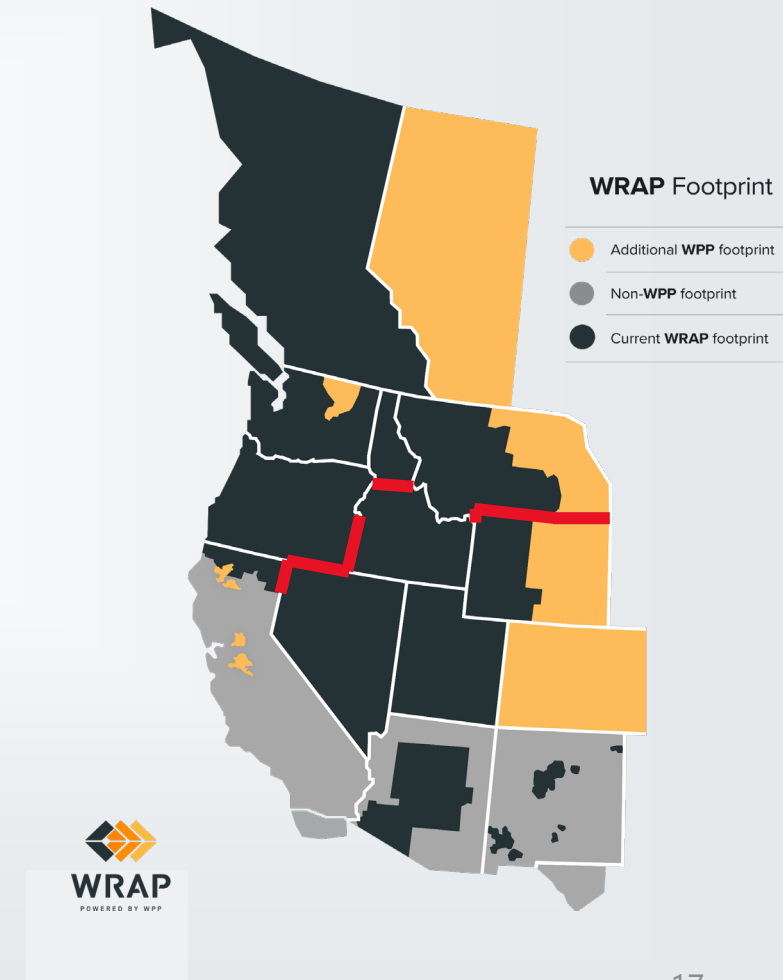
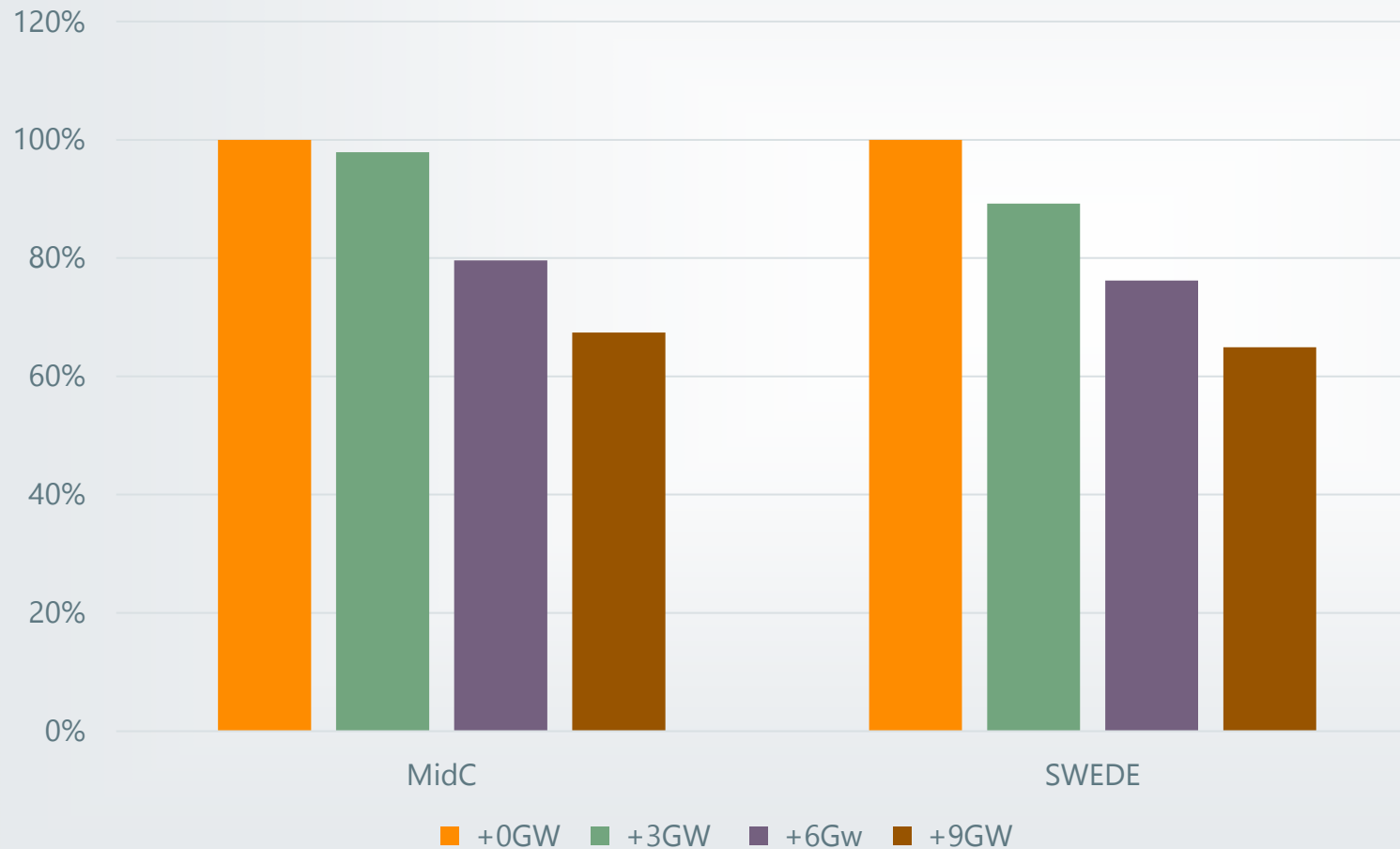
Subregion	Nameplate Capacity (MW)
MidC	248
SWEDE	5,603
Total	5,851

ESR ELCC - SUMMER

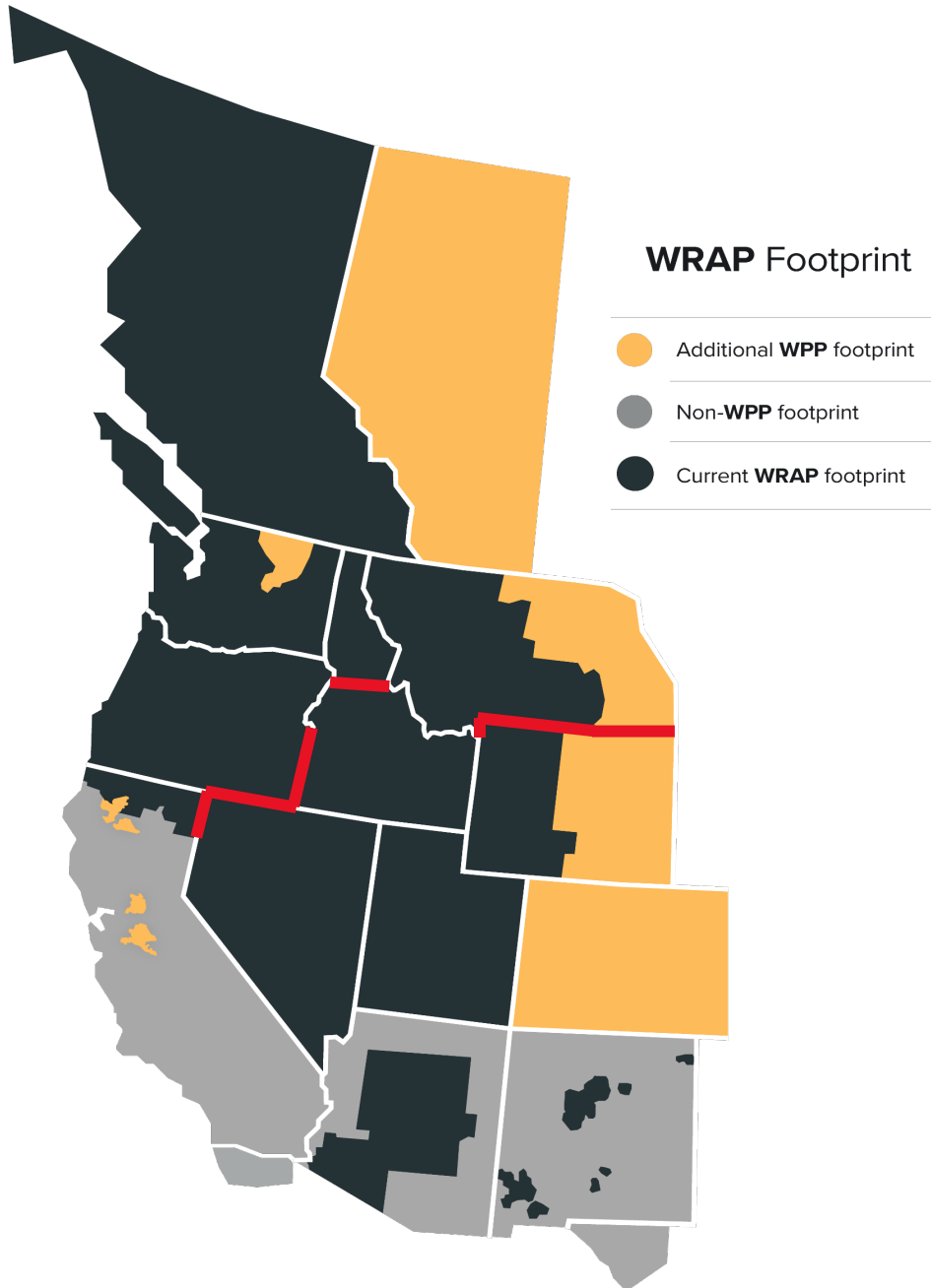


ESR ELCC

ESR AT INCREMENTAL GW INSTALLATIONS

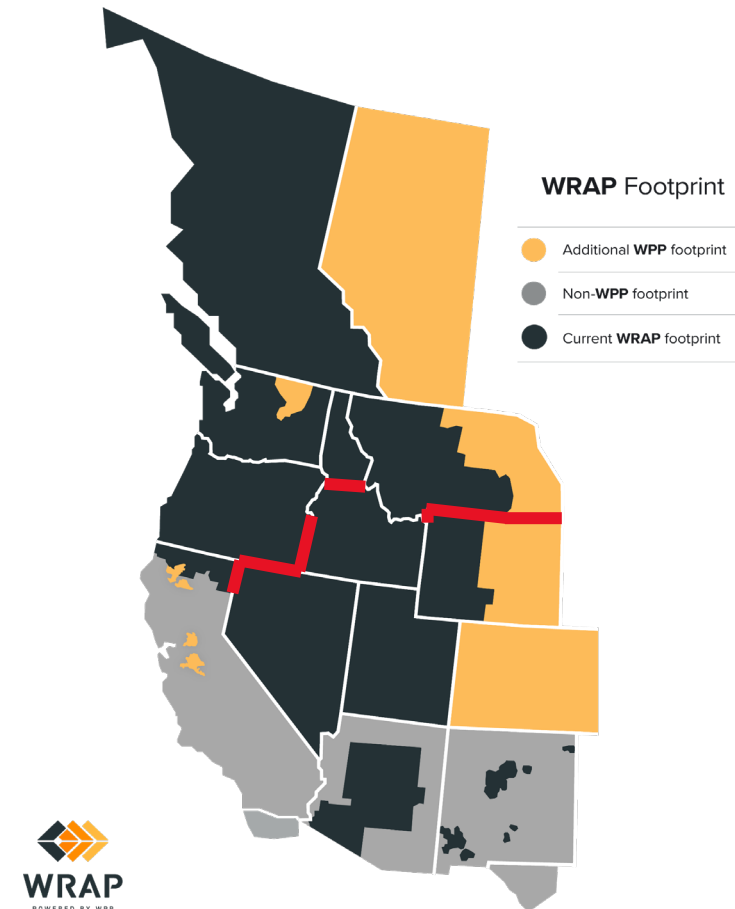
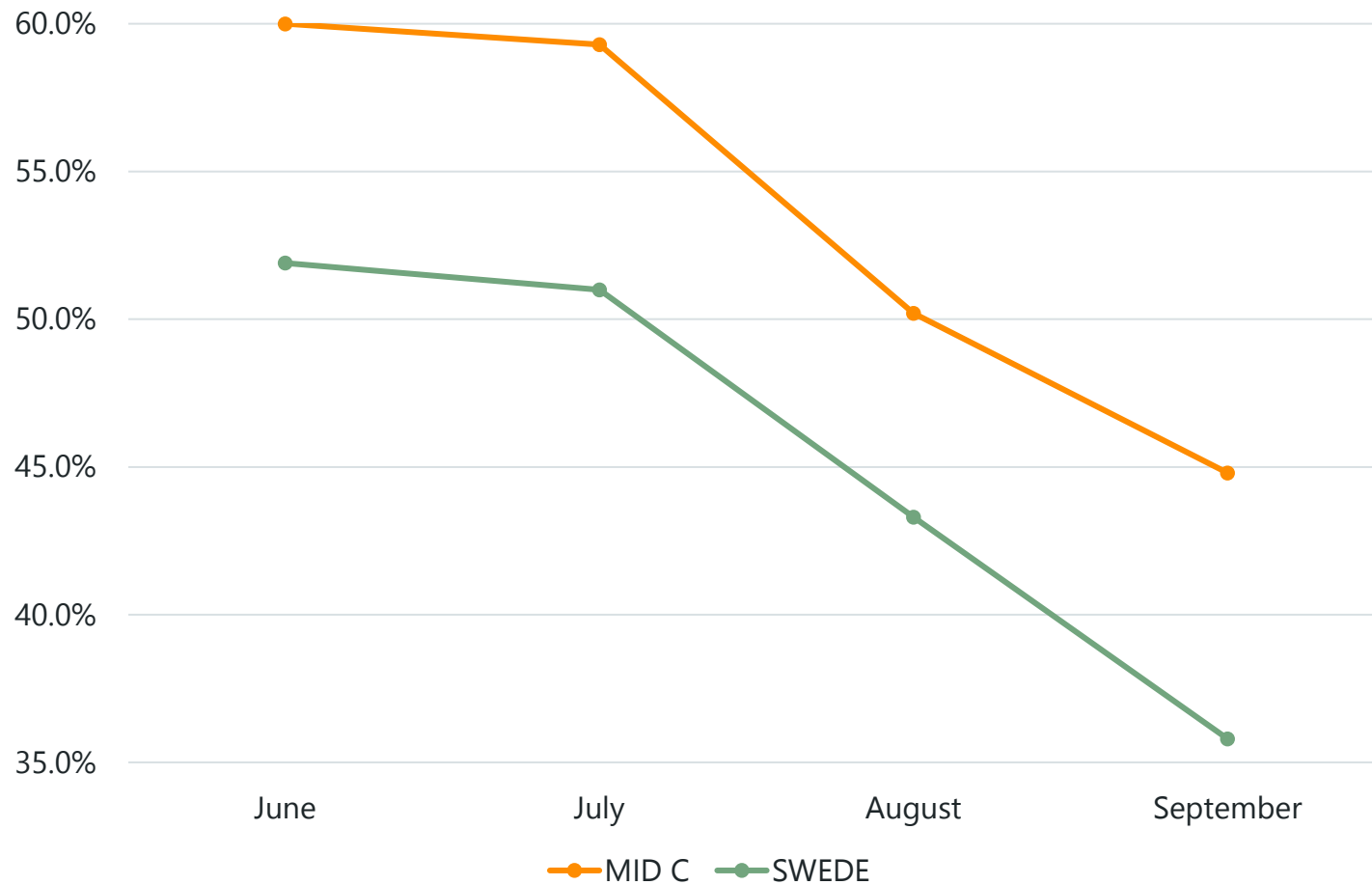


RUN OF RIVER (RoR) ZONES

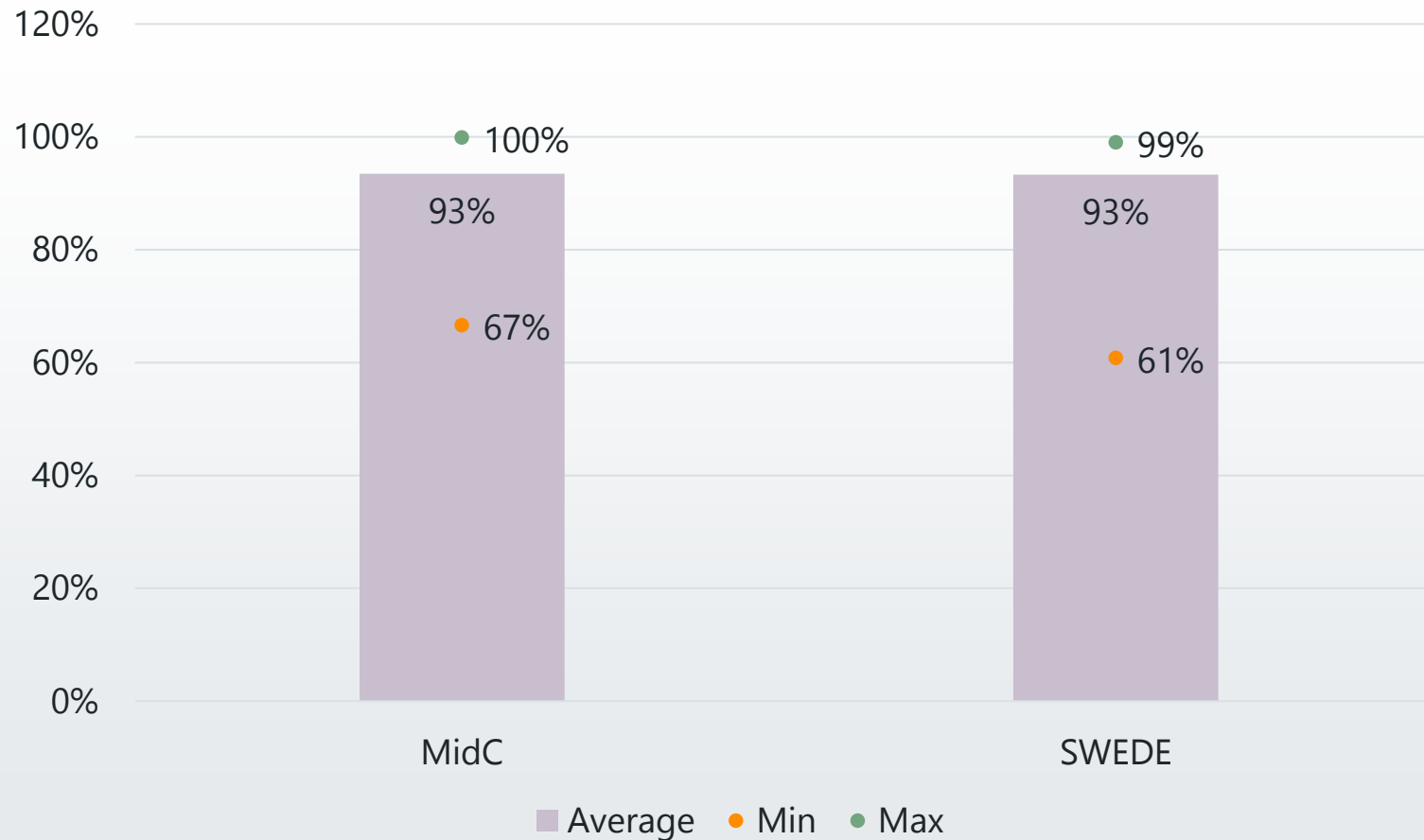


Subregion	Nameplate Capacity (MW)
MidC	3,510
SWEDE	1,165
Total	4,675

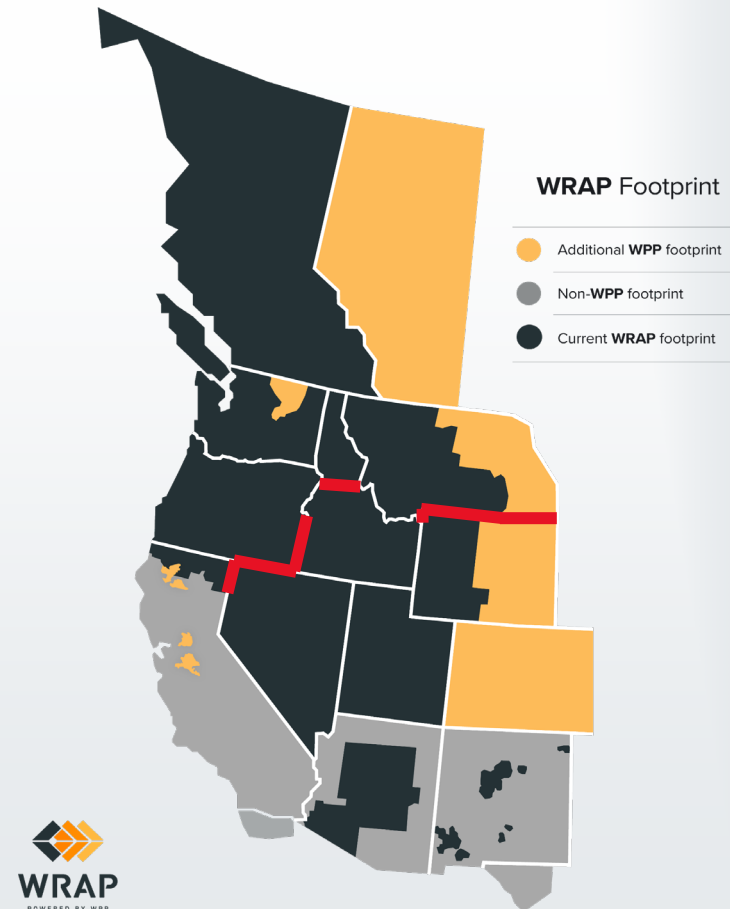
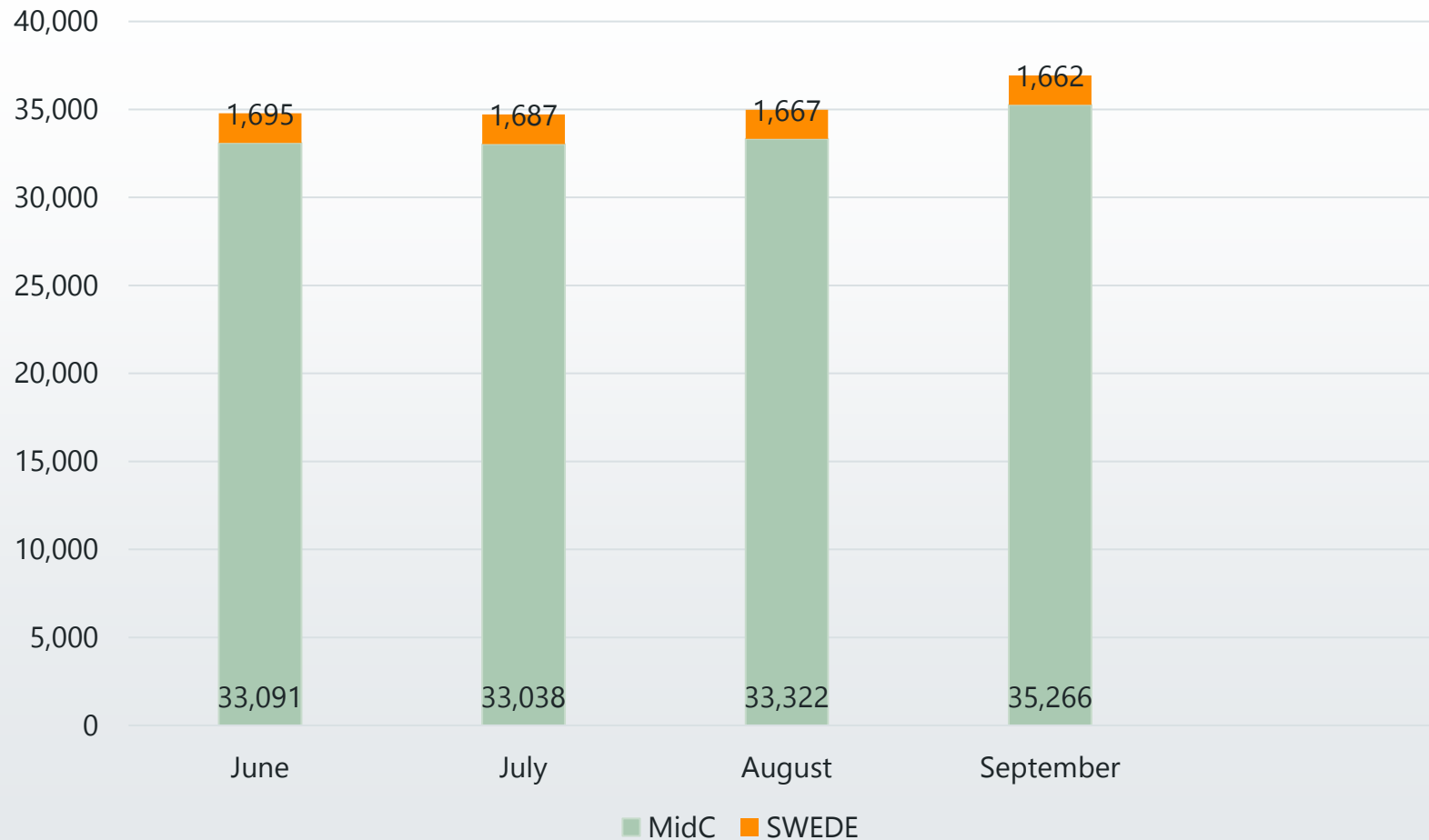
RoR QCC - SUMMER



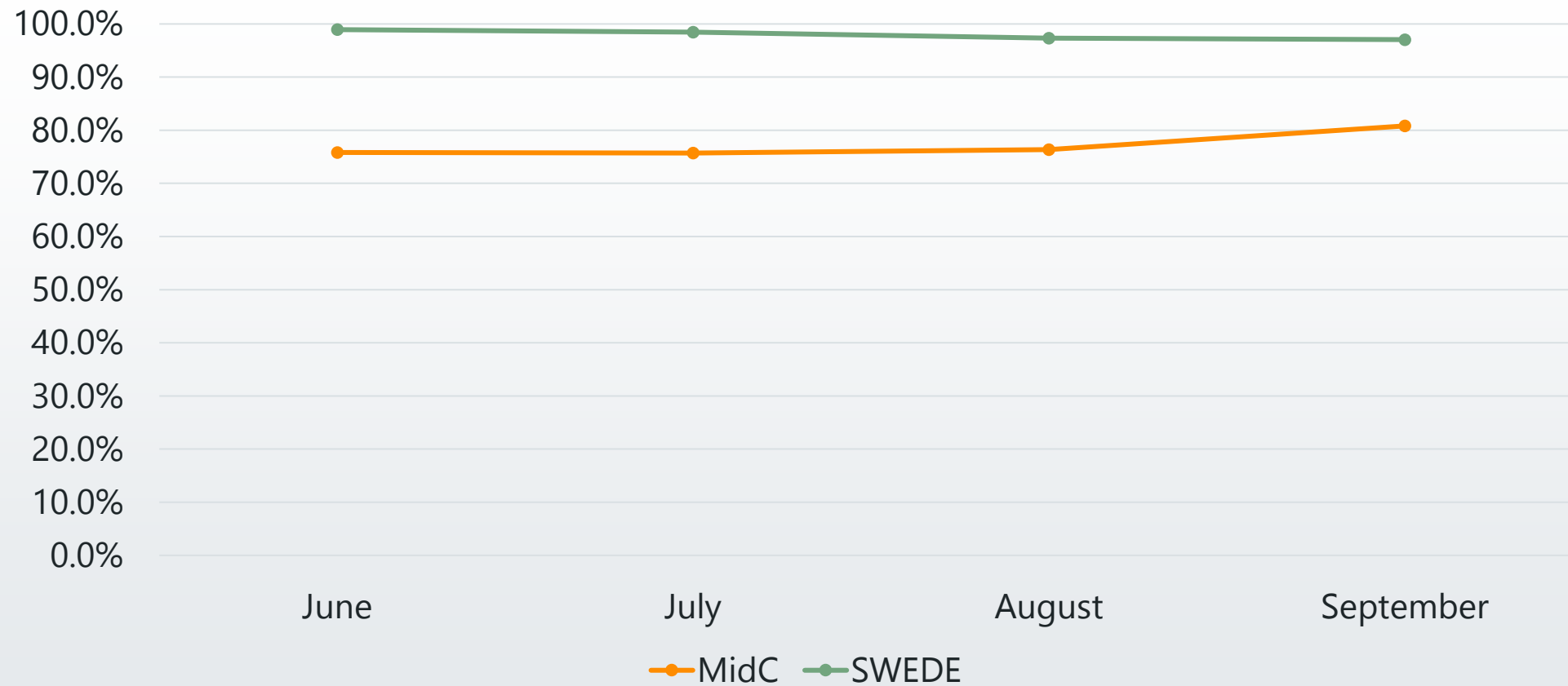
THERMAL QCC



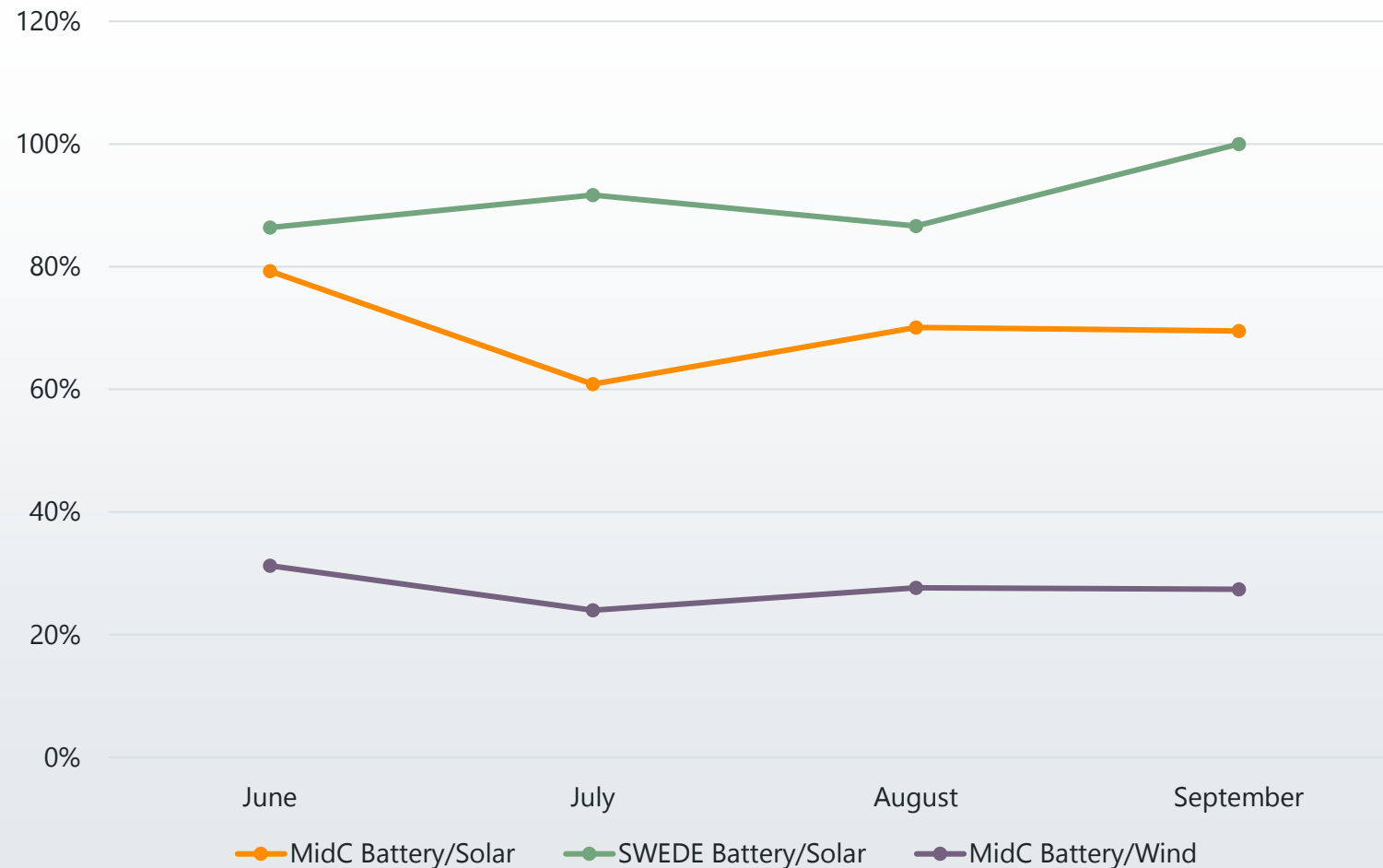
STORAGE HYDRO QCC MW



AVERAGE STORAGE HYDRO QCC



HYBRID RESOURCE QCC



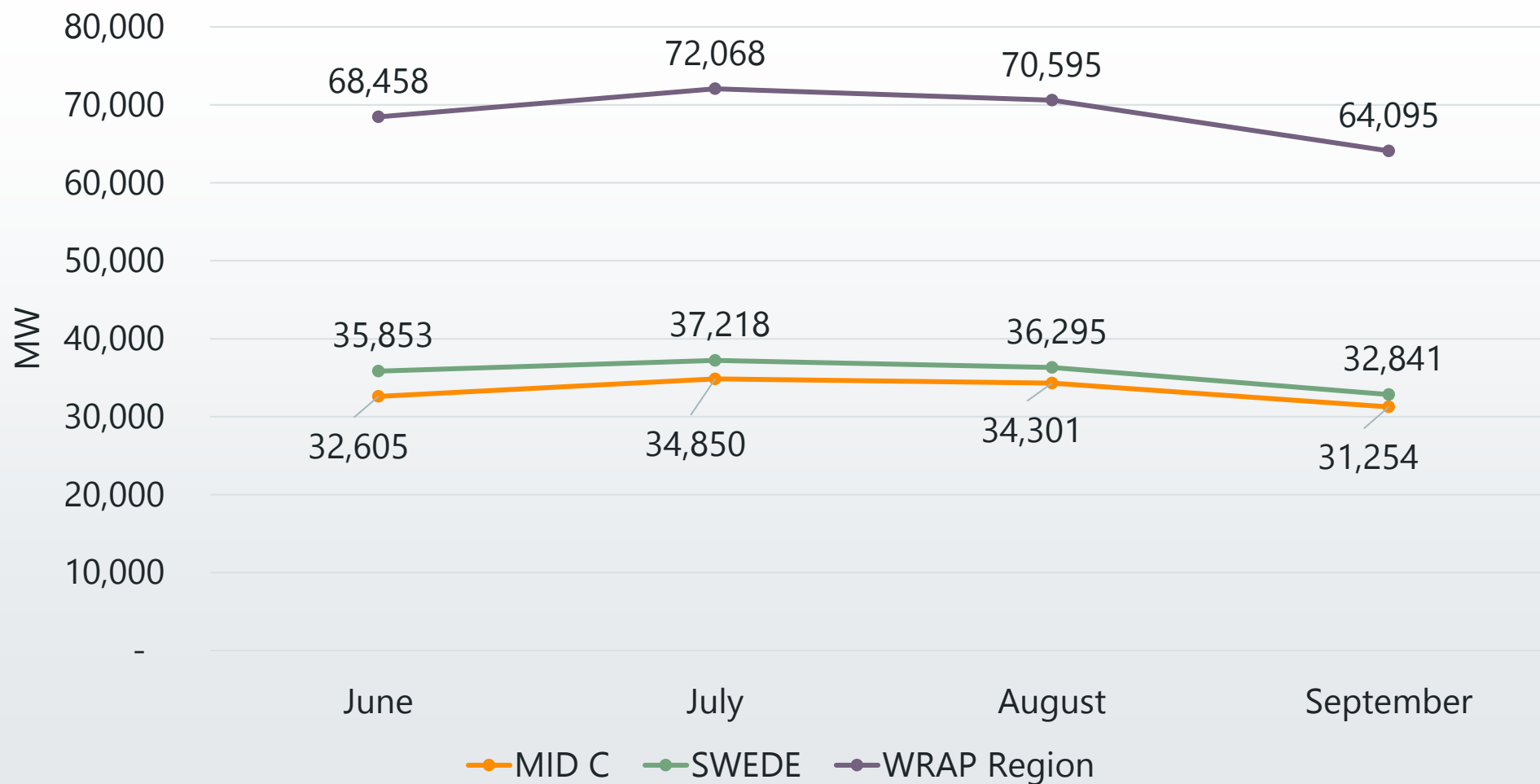
Number of installed pairings

	MidC	SWEDE
Battery/ Solar	4	36
Battery/ Wind	4	0

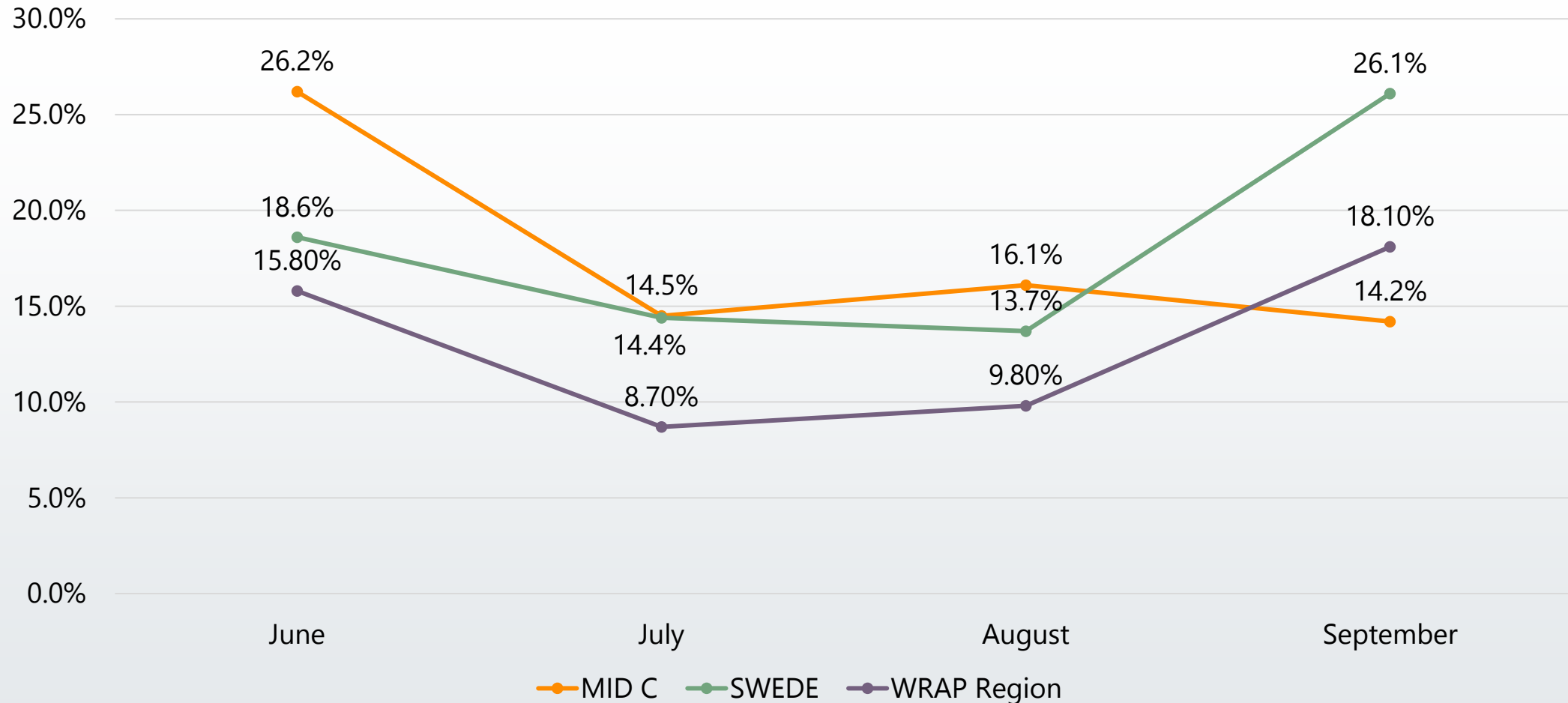
PRM CONSIDERATIONS

- » 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)

PEAK LOAD

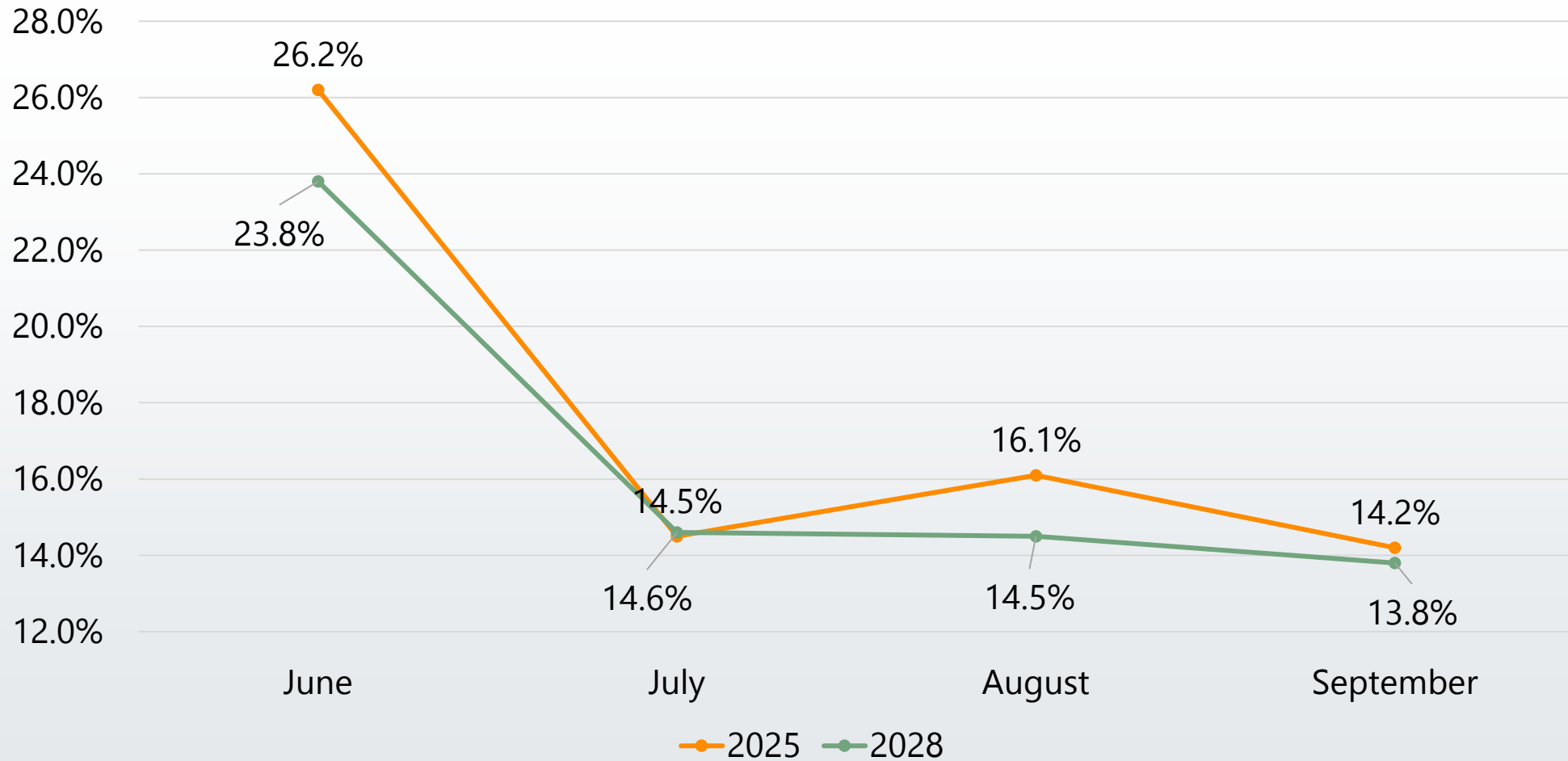


PRM – SUMMER 2025



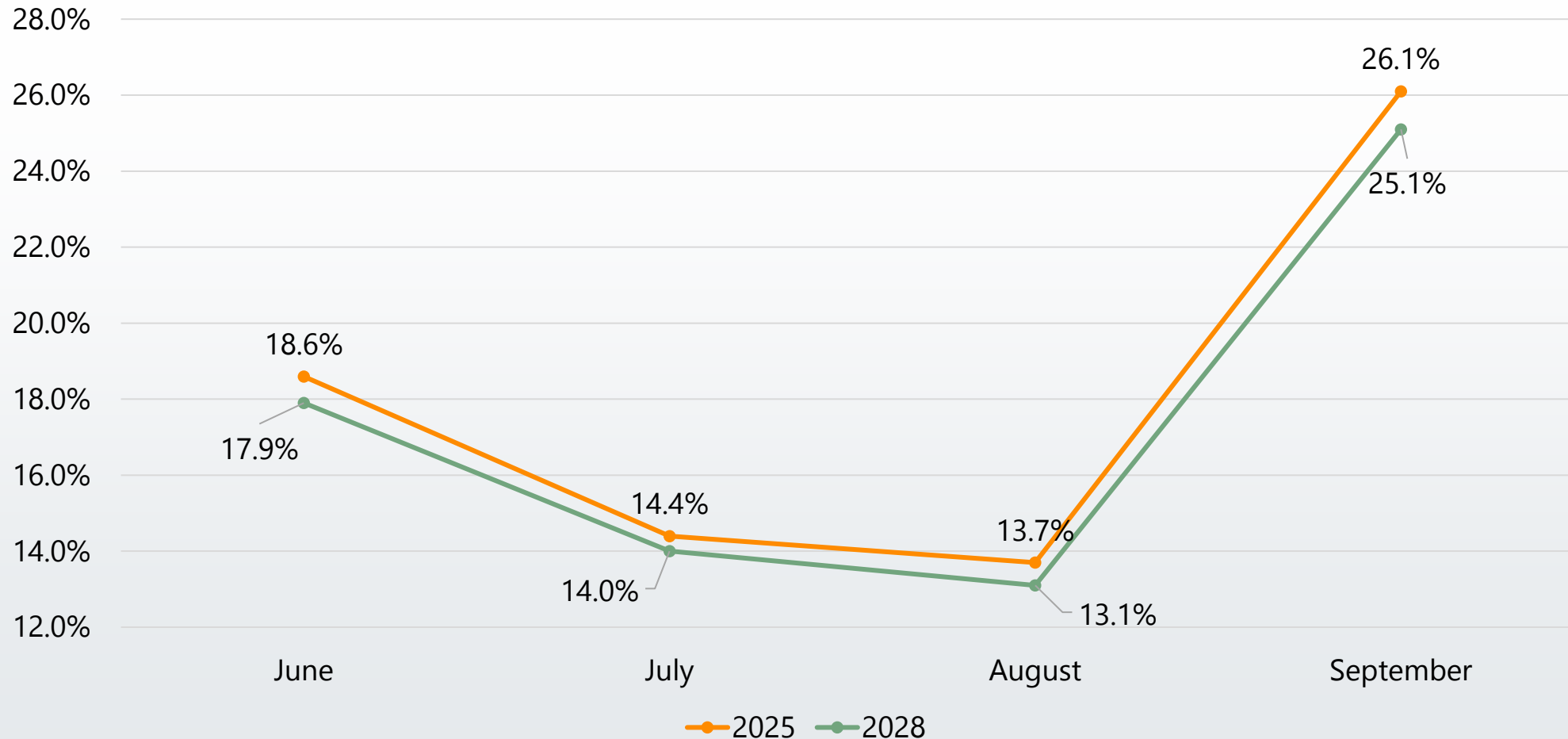
PRM – MidC SUMMER

2025 AND 2028



PRM – SWEDE SUMMER

2025 AND 2028



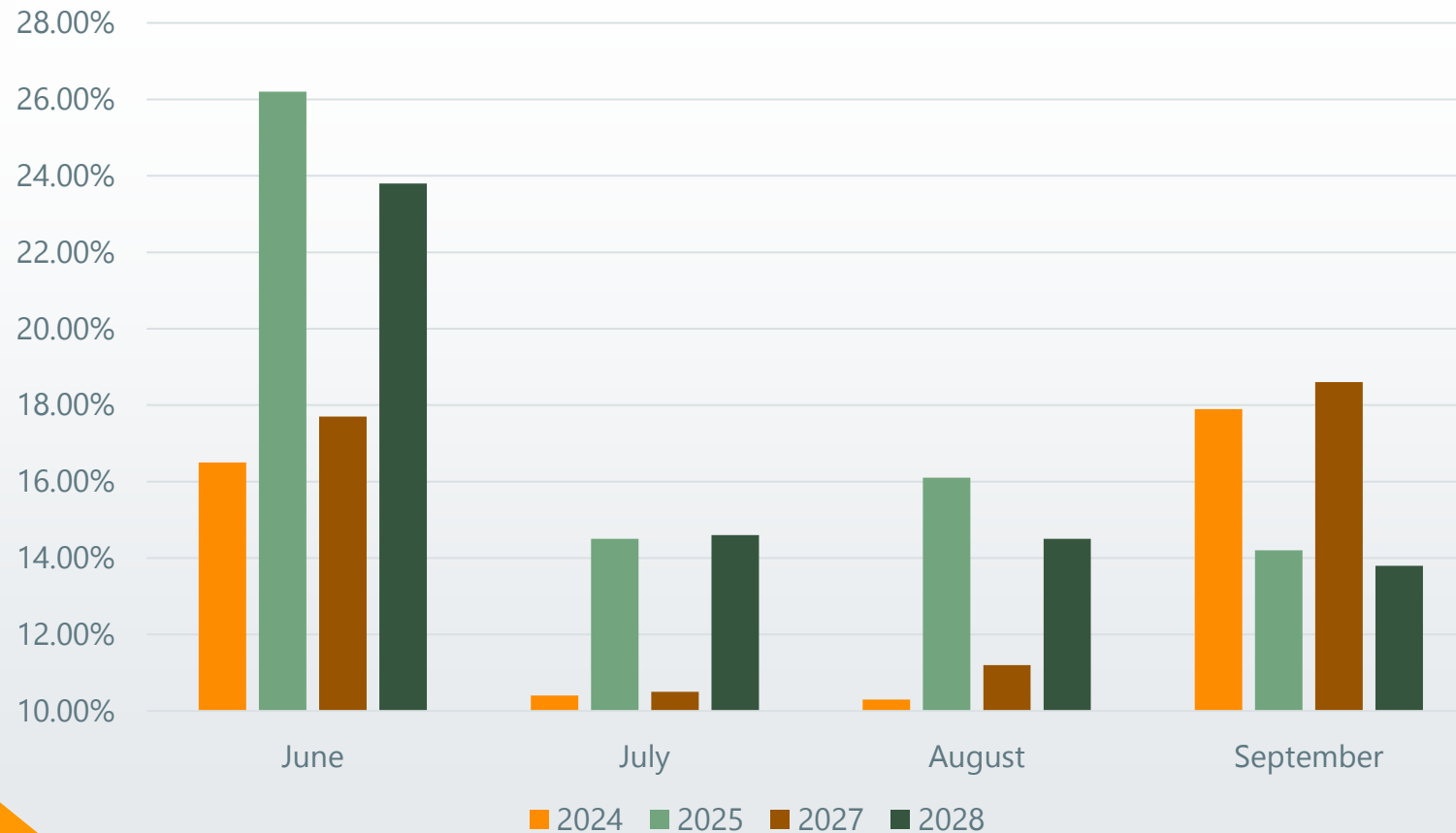
THANK YOU

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

PRM FROM PREVIOUS SUMMER SEASONS

PRMs – MIDC SUBREGION

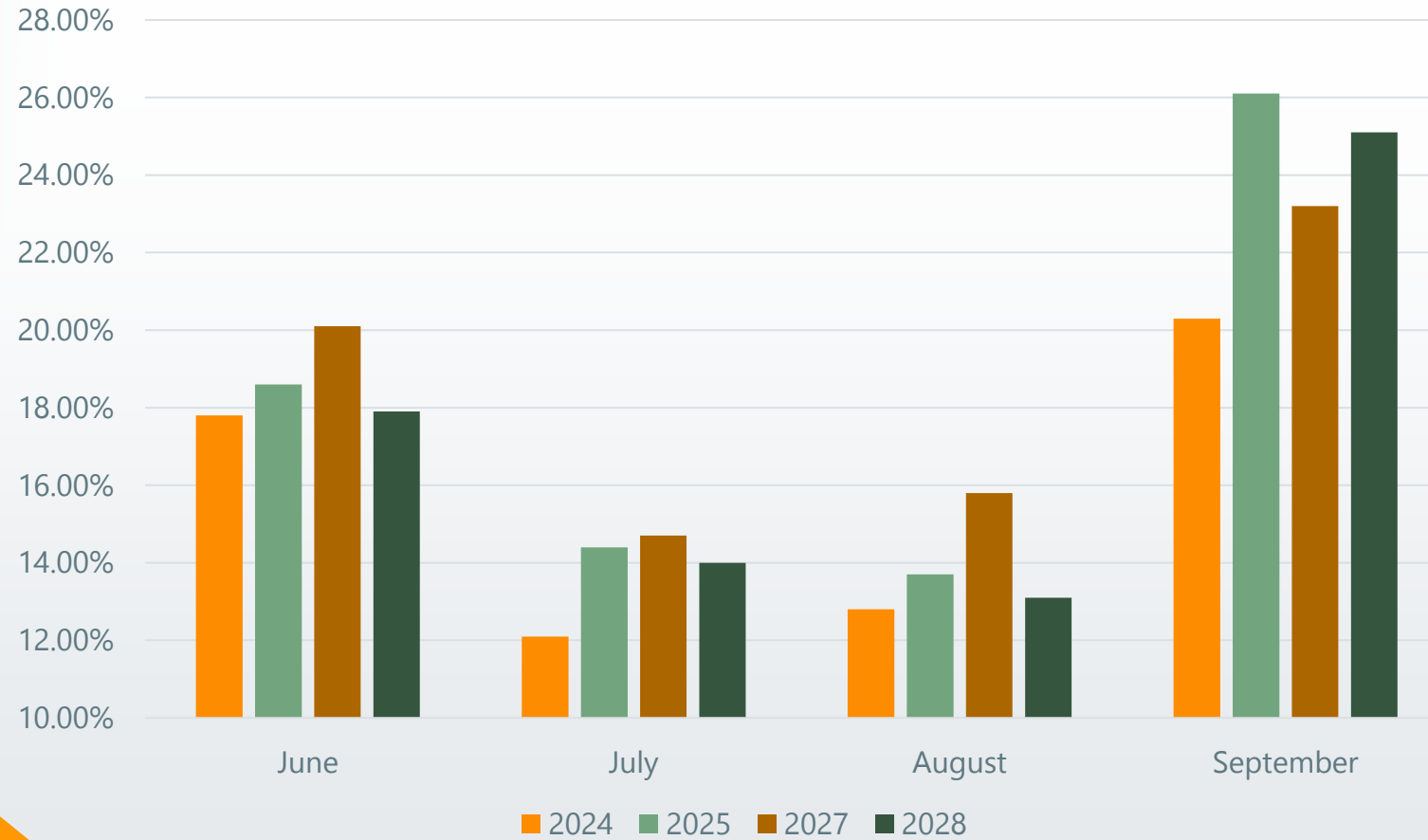
MidC PRMs



» 2024 and 2027 studies were done in 2022 with a slightly different footprint and different methodology

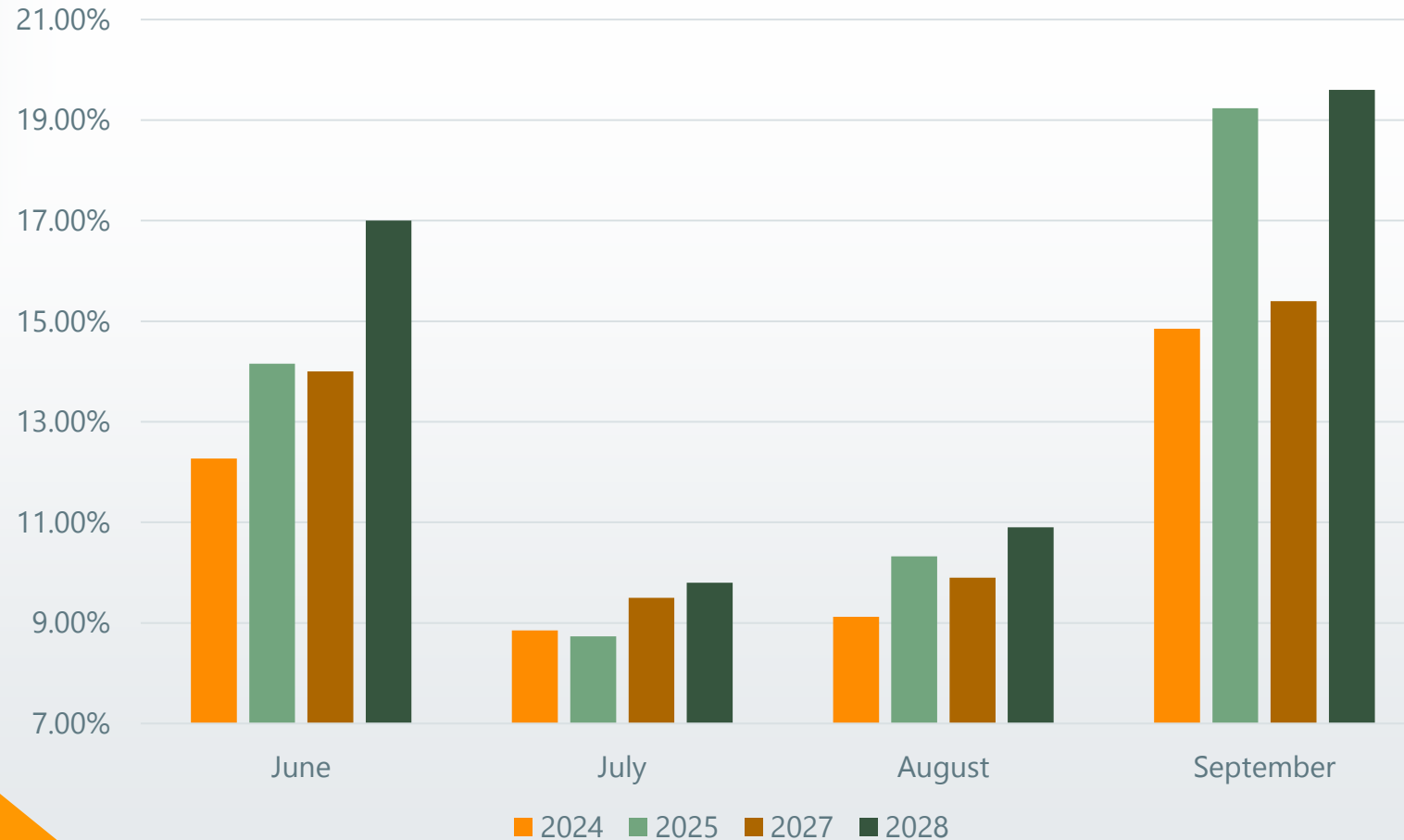
» 2027 and 2028 are advisory only

PRMs – SWEDE SUBREGION



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

PRMs – WRAP REGION



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