



**2022 LTSA Update**

ERCOT Staff

February 15, 2022

# 2022 LTSA Status Update

- Additional concepts selected:
  - Expanded Starting Capacity
    - Current Trends starting capacity includes planned resources which met Planning Guide 6.9(1) requirements as of March 31, 2021
    - Expanded Starting Capacity includes all planned resources included in the December 2021 CDR
  - Include Existing Roadmaps
    - Include transmission improvements identified in previous roadmap studies in base topology
  - Demand-Side Evolution
    - High rooftop solar adoption
    - High EV adoption
    - Managed EV charging
    - Large flexible load additions

## 2022 LTSA Status Update

- Current Trends iteration 1 capacity expansion complete
- Expanded Starting Capacity and Include Existing Roadmaps concepts will be combined into the Expanded System Outlook scenario
  - Expanded System Outlook capacity expansion complete
- Assumptions for Demand-Side Evolution are being finalized

# 2022 LTSA Scenarios

Current Trends

Expanded System Outlook

Demand-Side Evolution

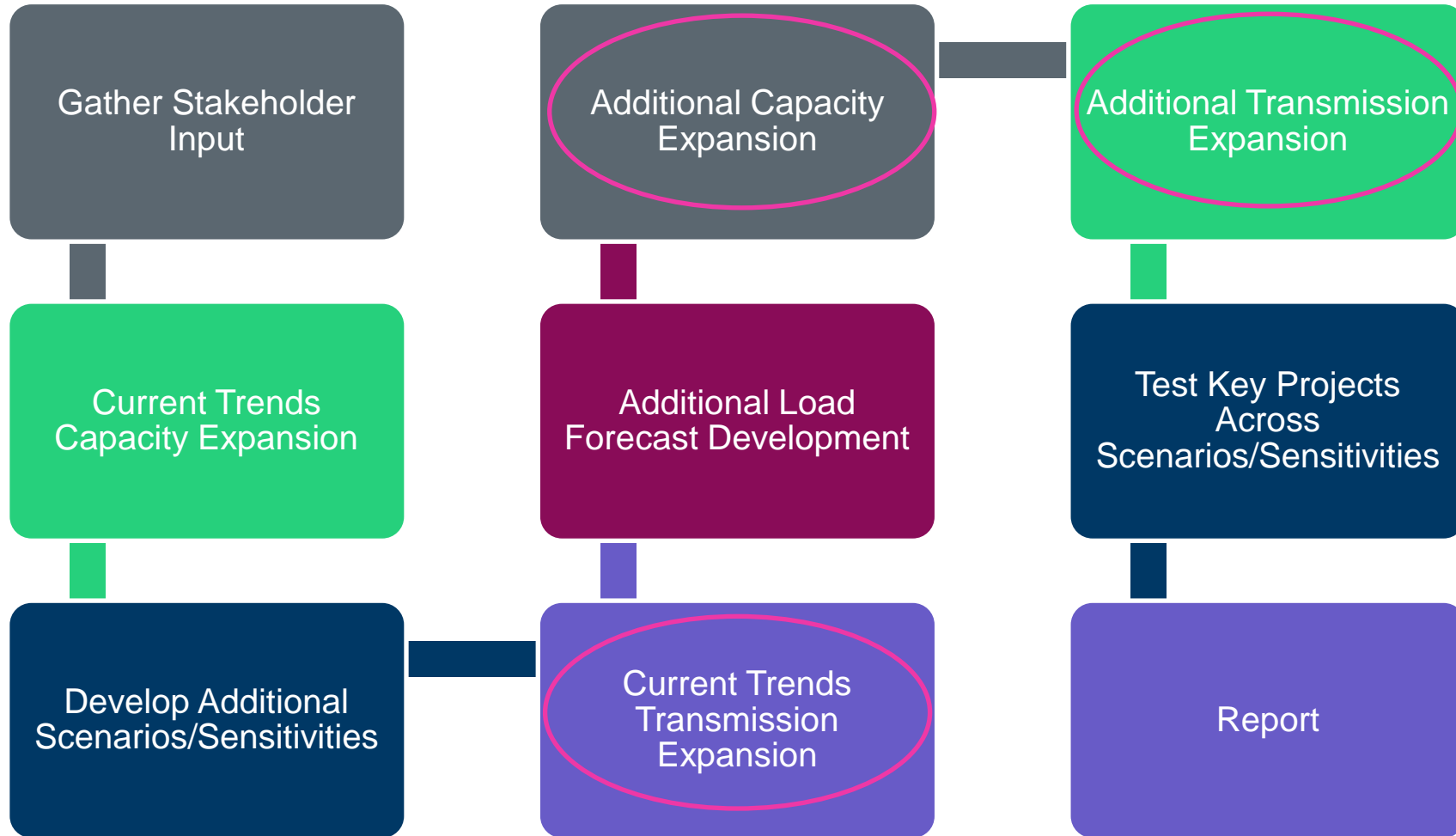
Single Node Model (Iteration 1)

Zonal Model (Iteration 2)

Expanded Starting Capacity

Include Existing Roadmaps

# 2022 LTSA Process



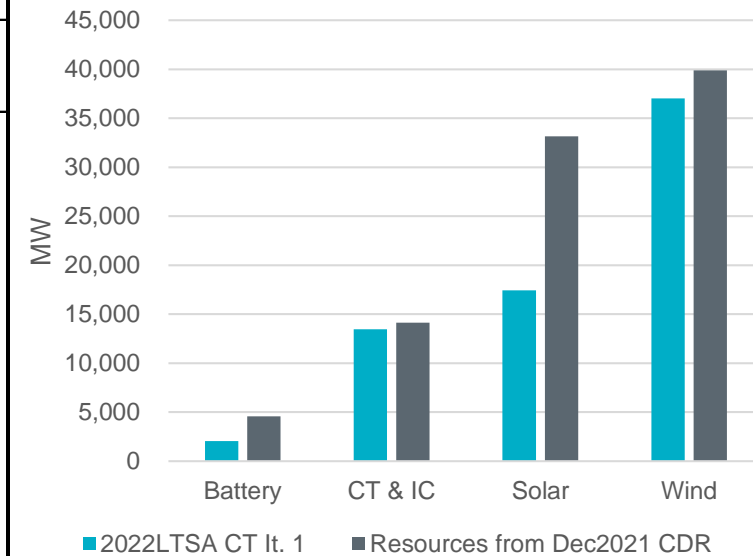
# Initial Results: Expanded System Outlook

Fred Khodabakhsh

# Starting Capacity Mix Comparison

- Current Trends starting capacity mix includes planned resources which met Planning Guide 6.9(1) requirements as of March 31, 2021
- A new scenario was evaluated by considering additional planned resources from December 2021 CDR to see the impact on capacity expansion additions.

Capacity (MW)	2022LTSA - Current Trends Iteration 1 (CT It. 1)			Resources From December 2021 CDR	
	Operational Resources	Planned Resources	Total	Incremental to CT It. 1	Total
<b>Battery</b>	235	1,807	2,042	2,523	4,565
<b>Combined Cycle</b>	37,478	86	37,564	0	37,564
<b>CT &amp; IC</b>	12,616	860	13,476	663	14,139
<b>Gas Steam</b>	11,620	60	11,680	0	11,680
<b>Solar</b>	4,095	13,332	17,427	15,719	33,146
<b>Wind</b>	25,203	11,821	37,024	2,853	39,877
<b>Coal</b>	13,630	0	13,630	0	13,630
<b>Hydro</b>	536	0	536	0	536
<b>Nuclear</b>	5,153	0	5,153	0	5,153
<b>Other</b>	920	0	920	0	920
<b>Total</b>	111,485	27,965	139,451	21,759	161,209



# 15-Year Capacity Expansion Comparison (2023-2037)

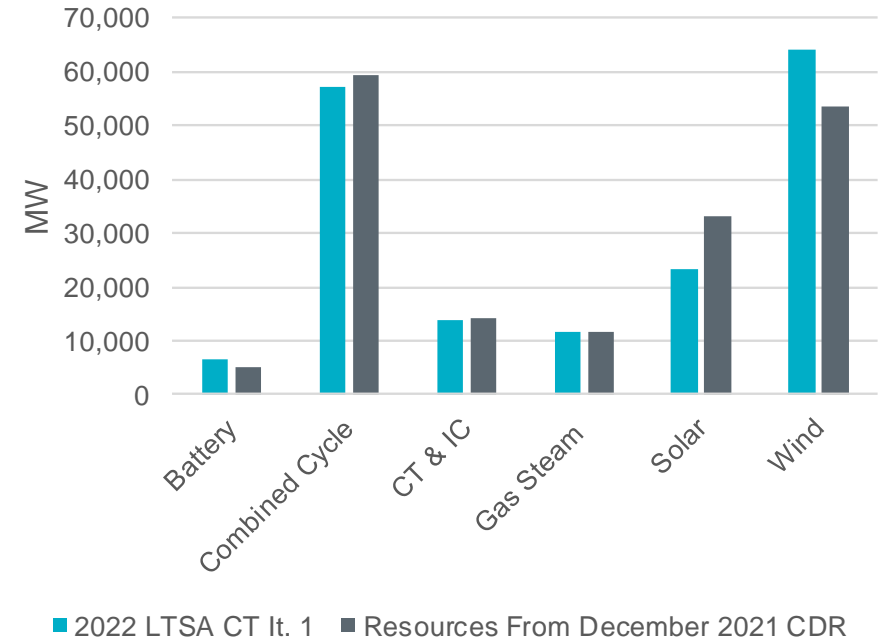
	Operational Resources	2022LTSA - Current Trends Iteration 1 (CT It. 1) (MW)			Resources From December 2021 CDR (MW)		
		Total Planned	Capacity Expansion	Total Resources	Incremental to CT It. 1	Capacity Expansion	Total Resources
<b>Battery</b>	235	1,807	4,557	6,598	2,523	546	5,111
<b>Combined Cycle</b>	37,478	86	19,494	57,058	0	21,660	59,224
<b>CT &amp; IC</b>	12,616	860	474	13,950	663	0	14,139
<b>Gas Steam</b>	11,620	60	0	11,680	0	0	11,680
<b>Solar</b>	4,095	13,332	5,800	23,227	15,719	0	33,146
<b>Wind</b>	25,203	11,821	27,100	64,124	2,853	13,700	53,577
<b>Coal</b>	13,630	0	0	13,630	0	0	13,630
<b>Hydro</b>	536	0	0	536	0	0	536
<b>Nuclear</b>	5,153	0	0	5,153	0	0	5,153
<b>Other</b>	920	0	0	920	0	0	920
<b>Total</b>	111,485	27,965	57,425	196,875	21,759	35,906	197,115



# 15-Year Capacity Expansion Comparison (2023-2037)

Total Resources (MW)

	2022LTSA - Current Trends Iteration 1 (CT It. 1)	Resources From December 2021 CDR	Difference
<b>Battery</b>	6,598	5,111	-1,487
<b>Combined Cycle</b>	57,058	59,224	2,166
<b>CT &amp; IC</b>	13,950	14,139	189
<b>Gas Steam</b>	11,680	11,680	0
<b>Solar</b>	23,227	33,146	9,919
<b>Wind</b>	64,124	53,577	-10,547
<b>Coal</b>	13,630	13,630	0
<b>Hydro</b>	536	536	0
<b>Nuclear</b>	5,153	5,153	0
<b>Other</b>	920	920	0
<b>Total</b>	196,875	197,115	240

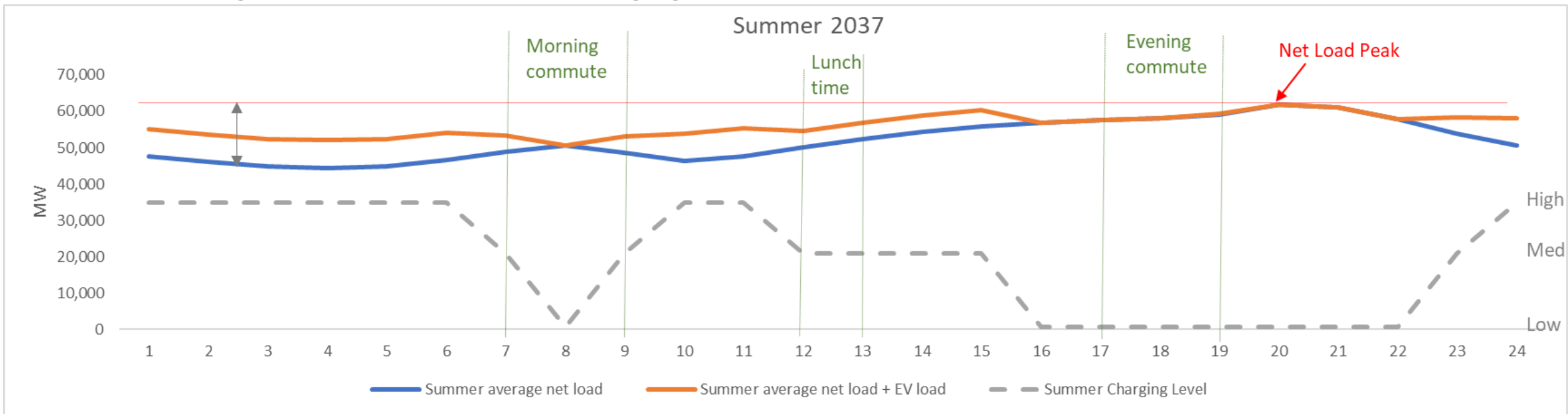


# Managed EV Charging for Demand-Side Evolution Scenario

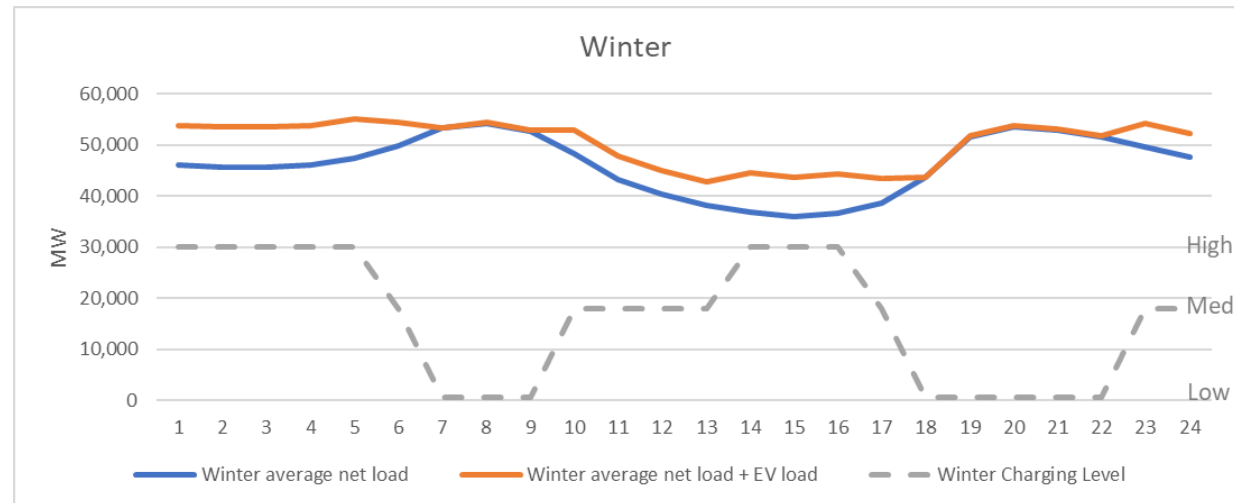
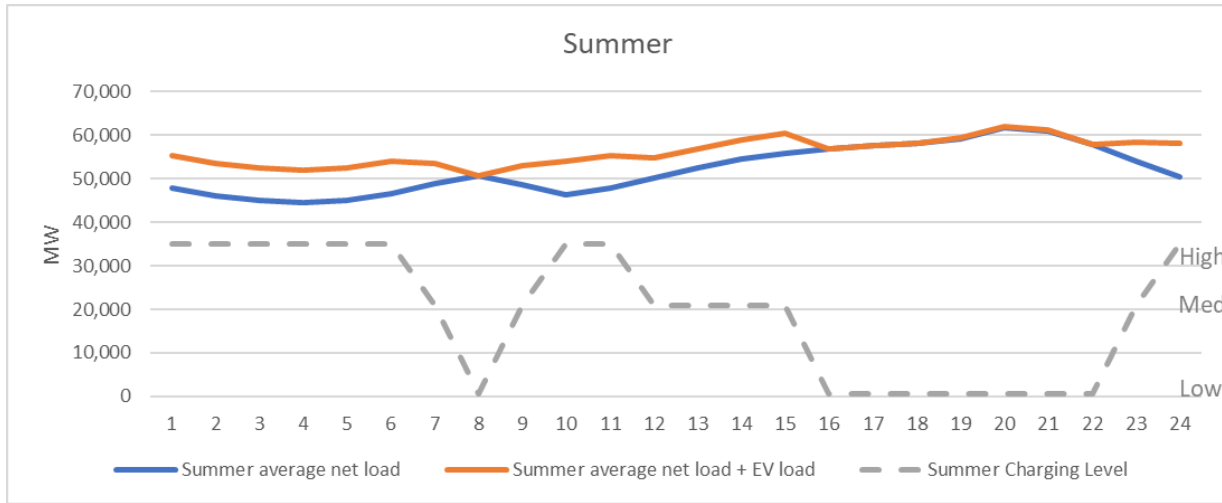
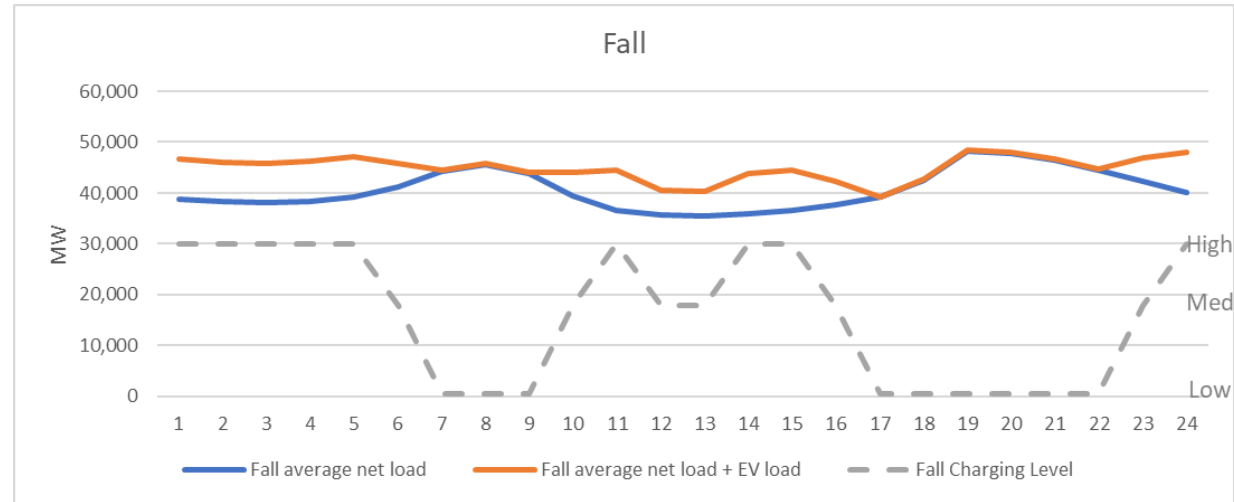
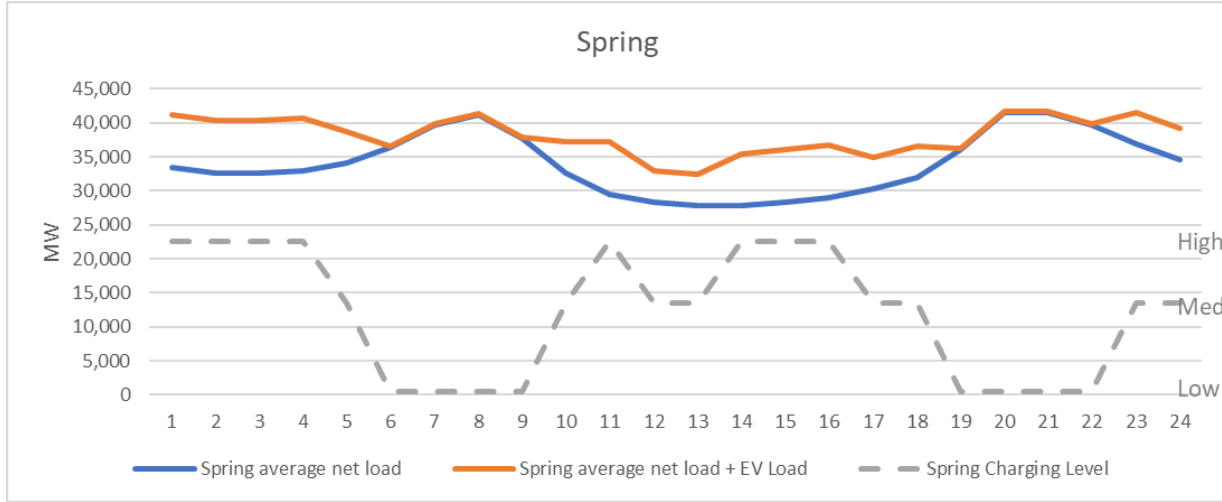
Julie Jin

# Managed EV Charging Concept

- Assume managed EV charging when there is abundant renewable generation and non-EV load is not high
- EV charging load is distributed based on the following steps:
  - Calculate hourly average net load for each season since net load reflects both renewable generation output and non-EV load level
  - Based on the gap between the net load peak and hourly average net load with the consideration of driving needs to determine EV charging level

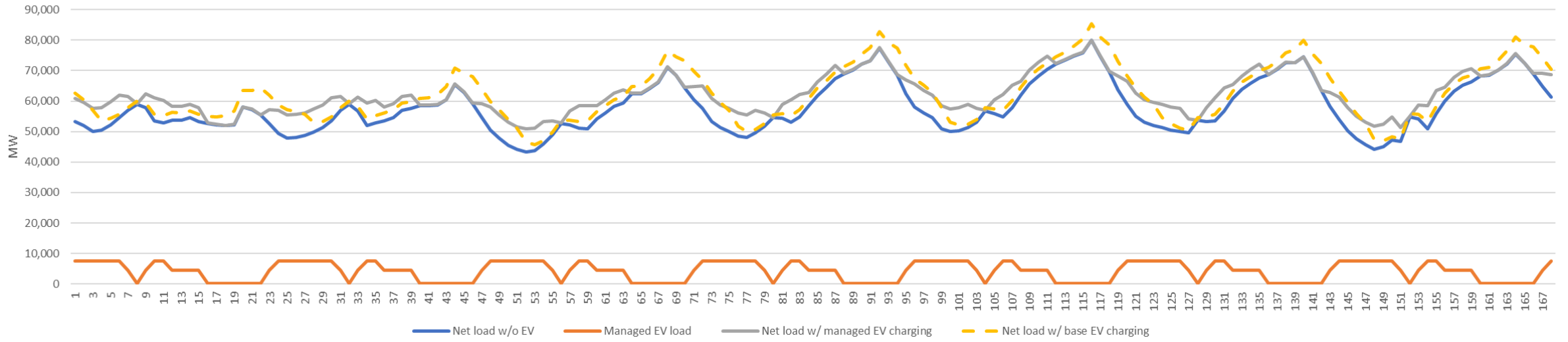


# One Charging Profile Per Season

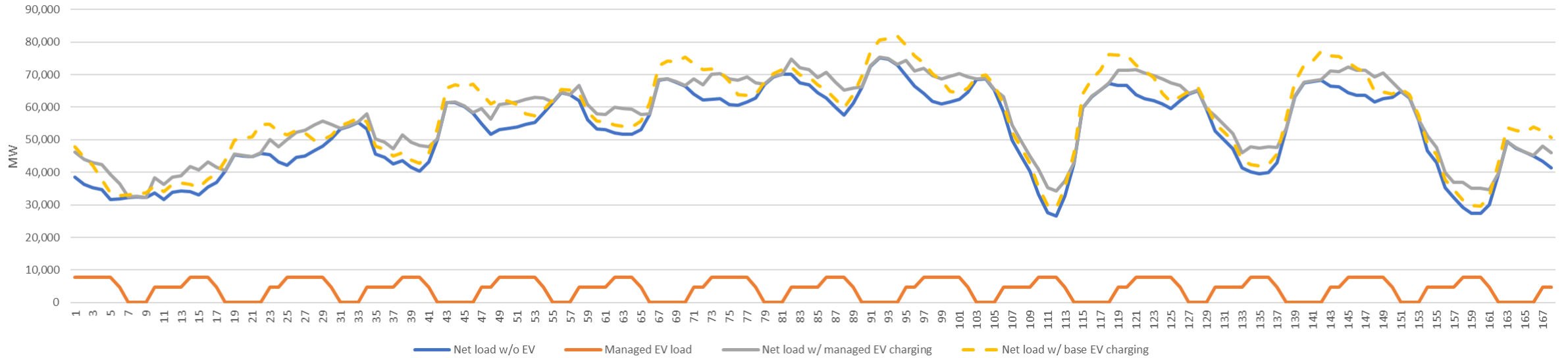


# Managed vs Base EV Charging - Net Load for Net Load Peak Week

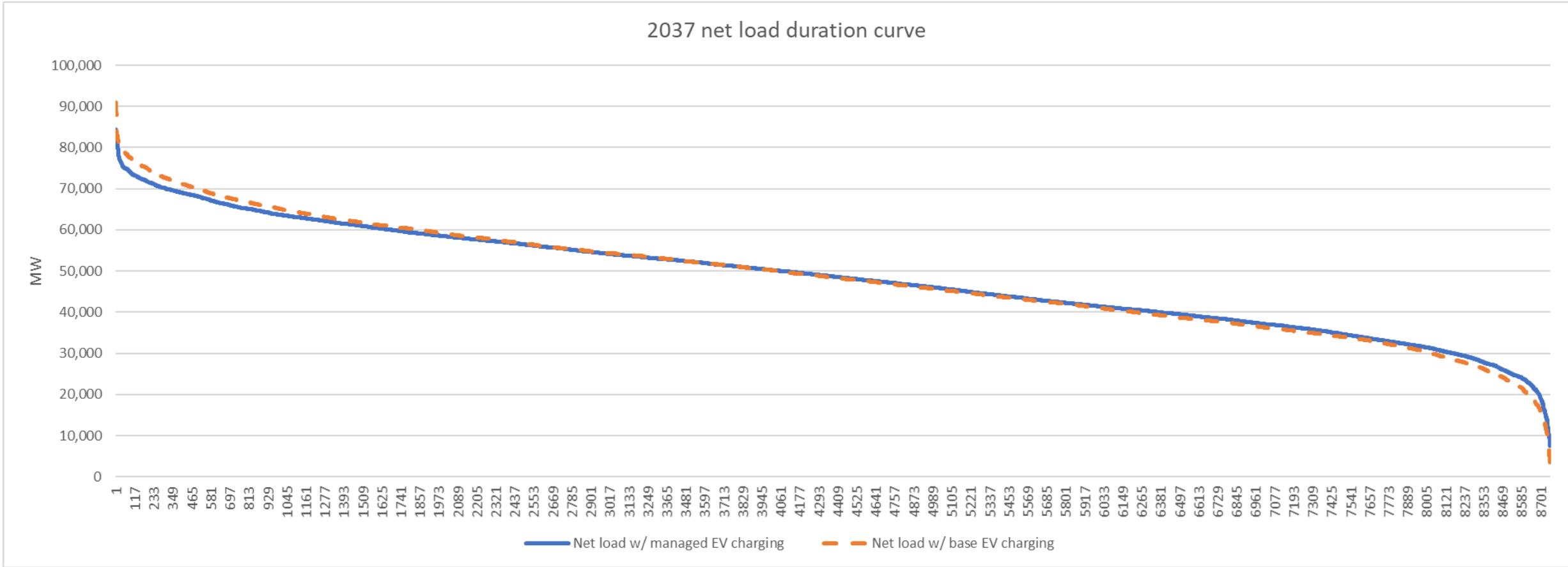
August 26 - September 2, 2037 summer net load peak week



January 12-18, 2037 winter net load peak week



# Managed vs Base EV Charging - Net Load Duration Curve



- With managed EV charging, peak net load is lower and minimum net load is higher.

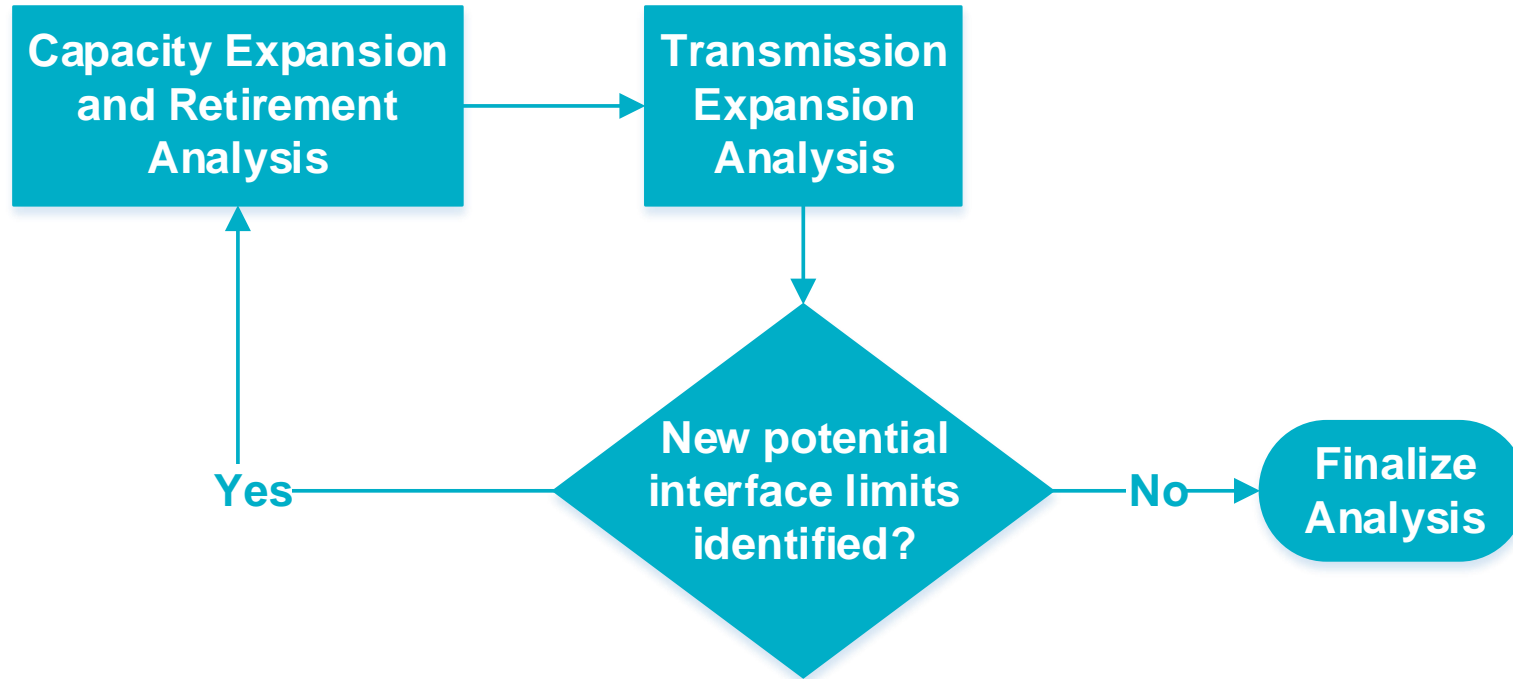
## Questions / Comments

- Please send questions or comments to [John.Bernecker@ercot.com](mailto:John.Bernecker@ercot.com)

# Appendix



# Iterative Capacity Expansion and Transmission Analysis



# Daily Electricity Consumption of EV Fleet for Current Trends

