

2024 Vermont Long-Range Transmission Plan (LRP)

Study Scope Review Meeting

July 12, 2024

Vermont System Planning
Committee

vermont electric power company



Outline

- 2024 LRP Planning Process
 - Background info
 - Milestones
- 2024 LRP Study Scope
 - Approach
 - Assumptions
 - Criteria
 - Forecast
- Next Steps

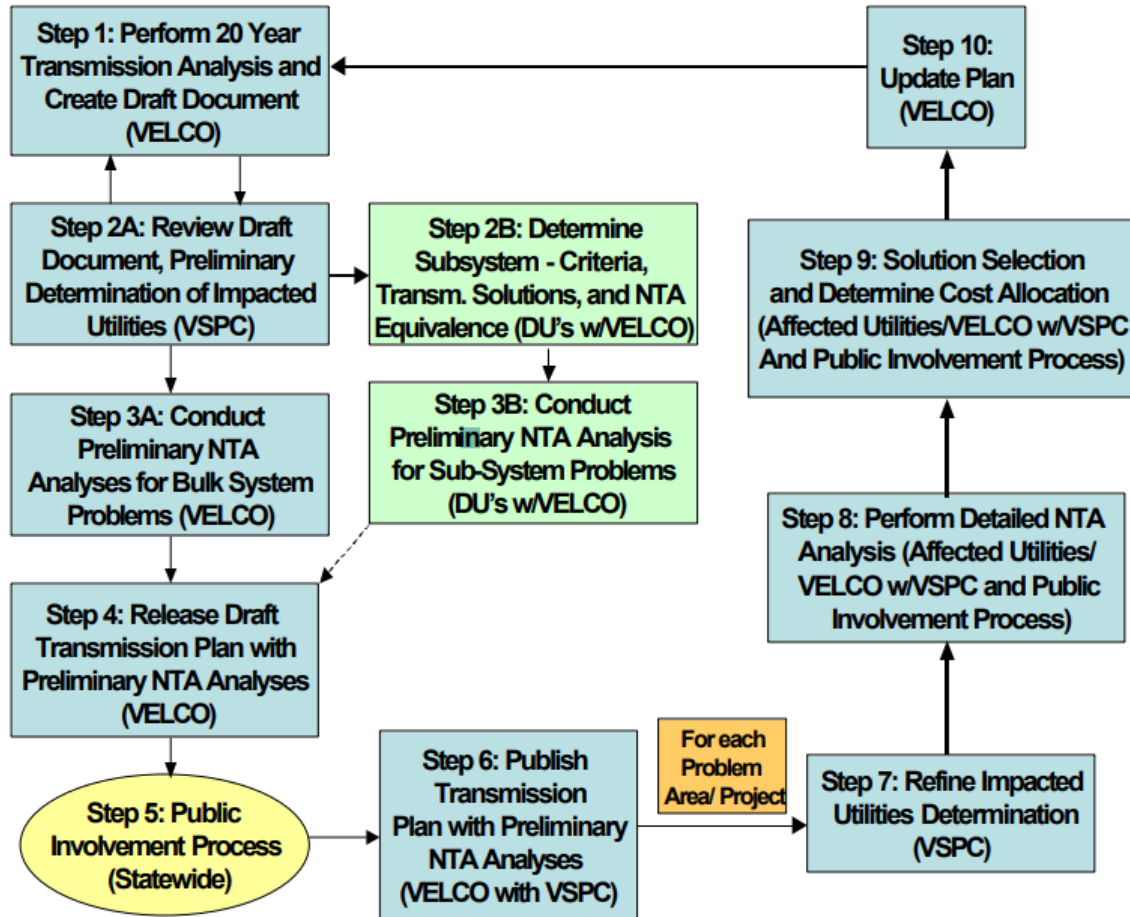
2024 LRP PLANNING PROCESS

Background

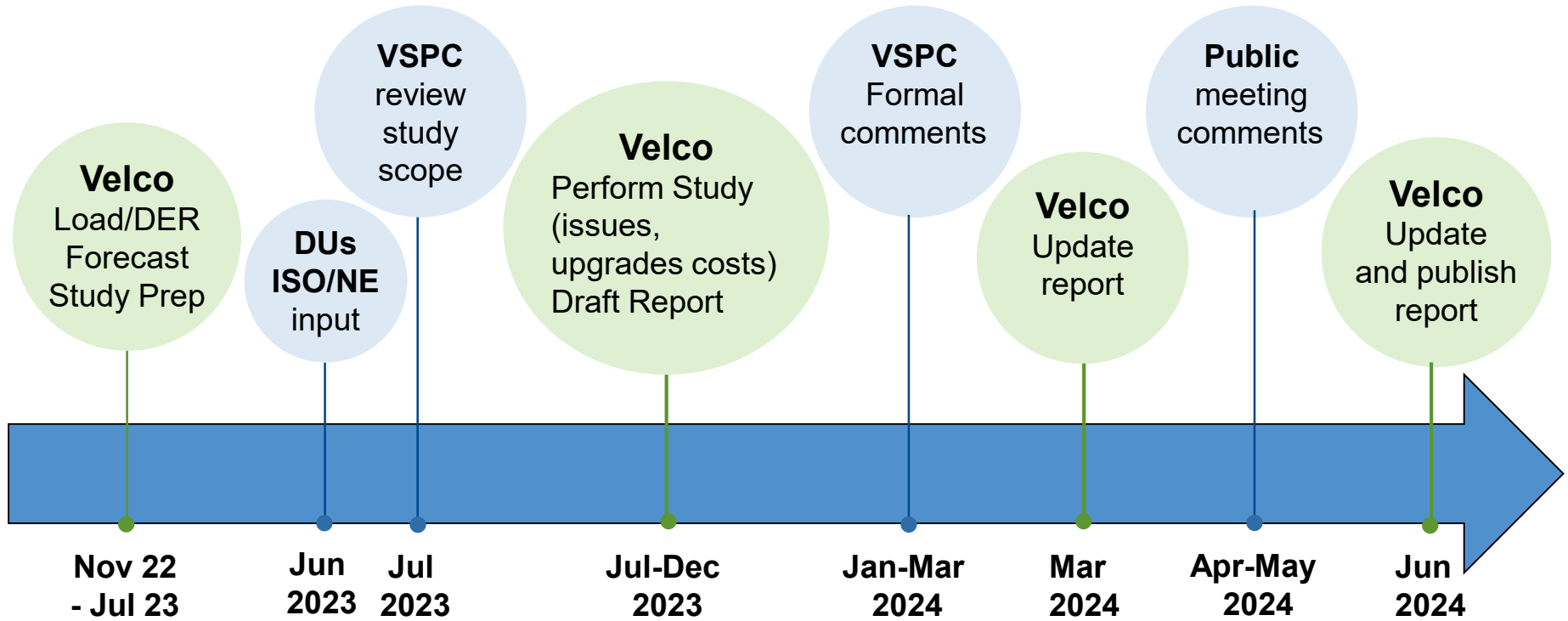
- 2005 Vermont General Assembly Act 61
 - VELCO to prepare a long-range electric transmission plan
 - Range > 10 years
 - Update every 3 years.
 - > 2 Public meetings
 - Coordinate with DUs
- 2006 PUC's Docket 7081 MOU
 - VSPC established
 - Planning process created
- 2007 Docket 7081
 - Study range: 20 years

Background

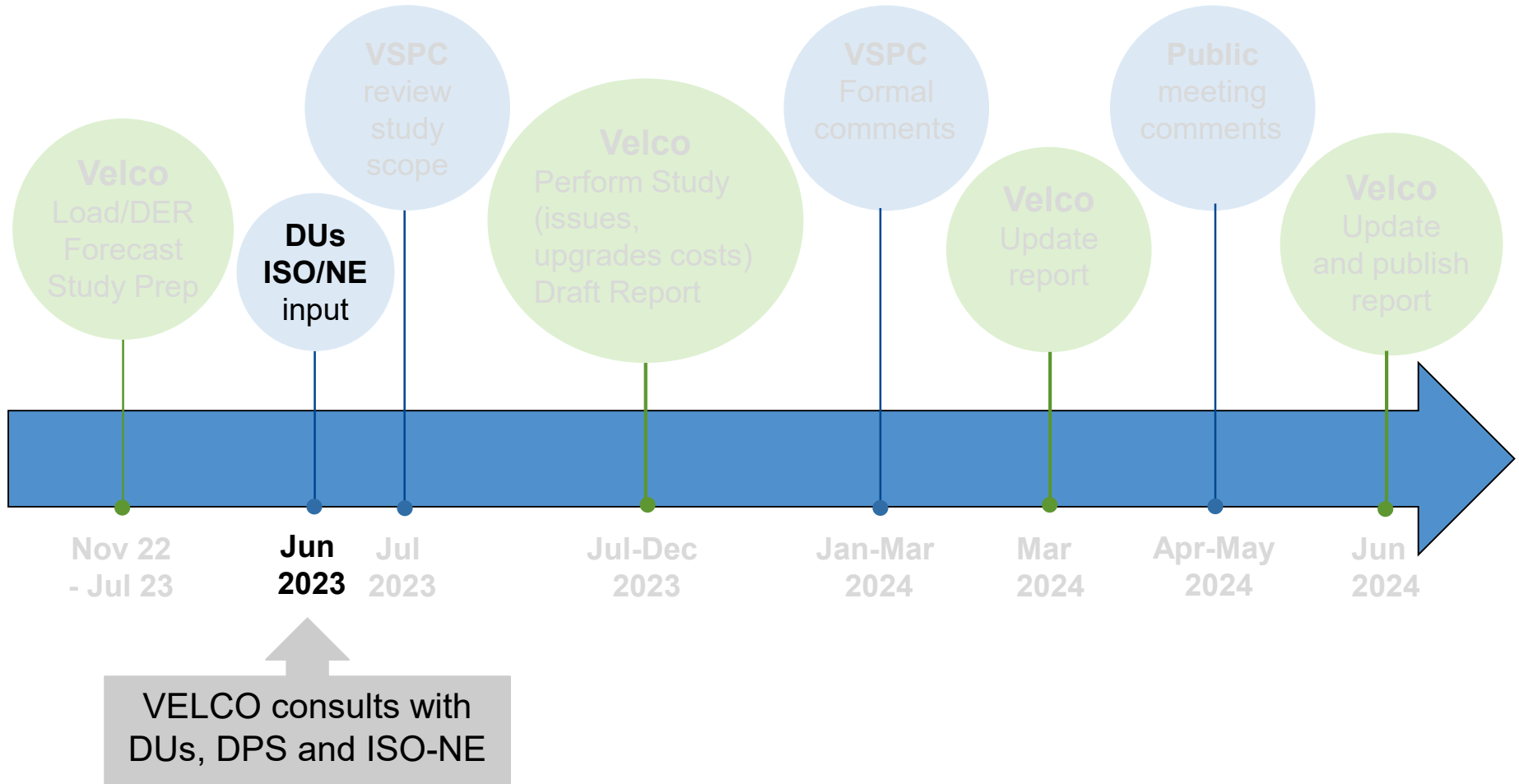
Transmission Planning Process Including Non-Transmission Alternatives



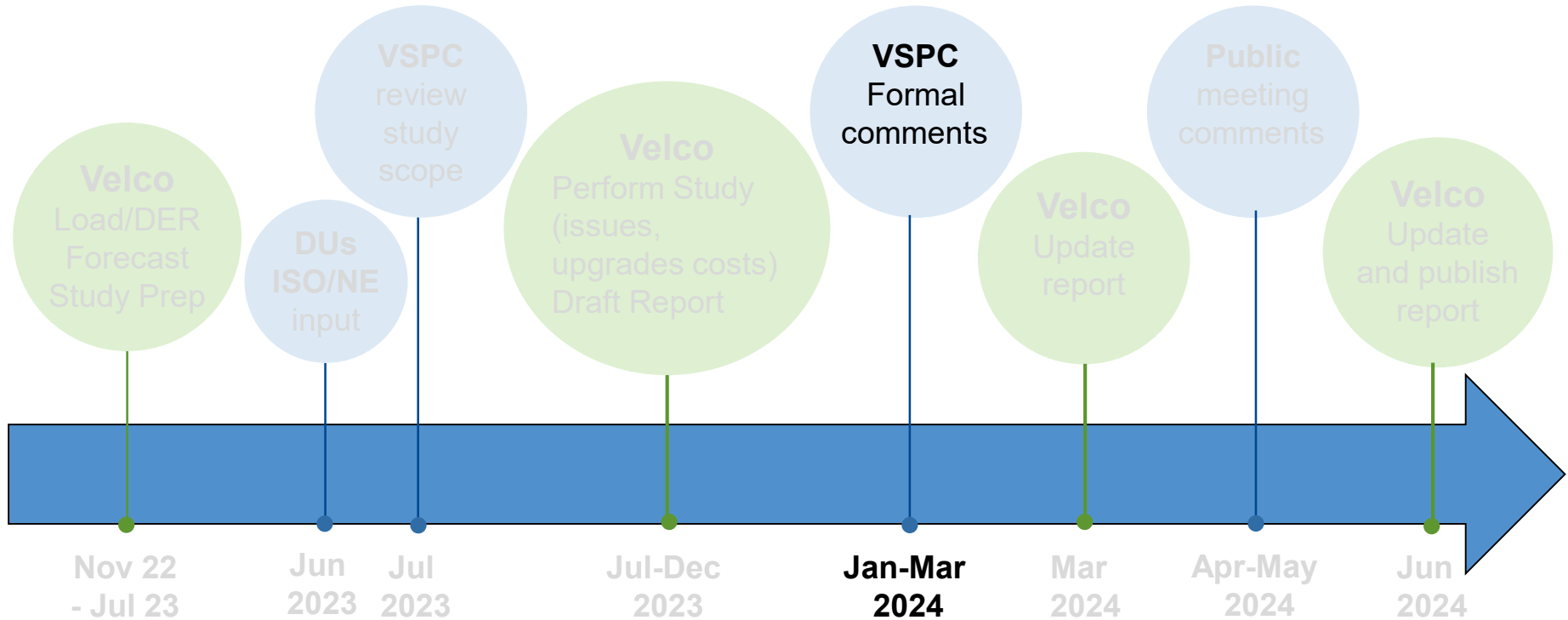
LRP Milestones



LRP Milestones

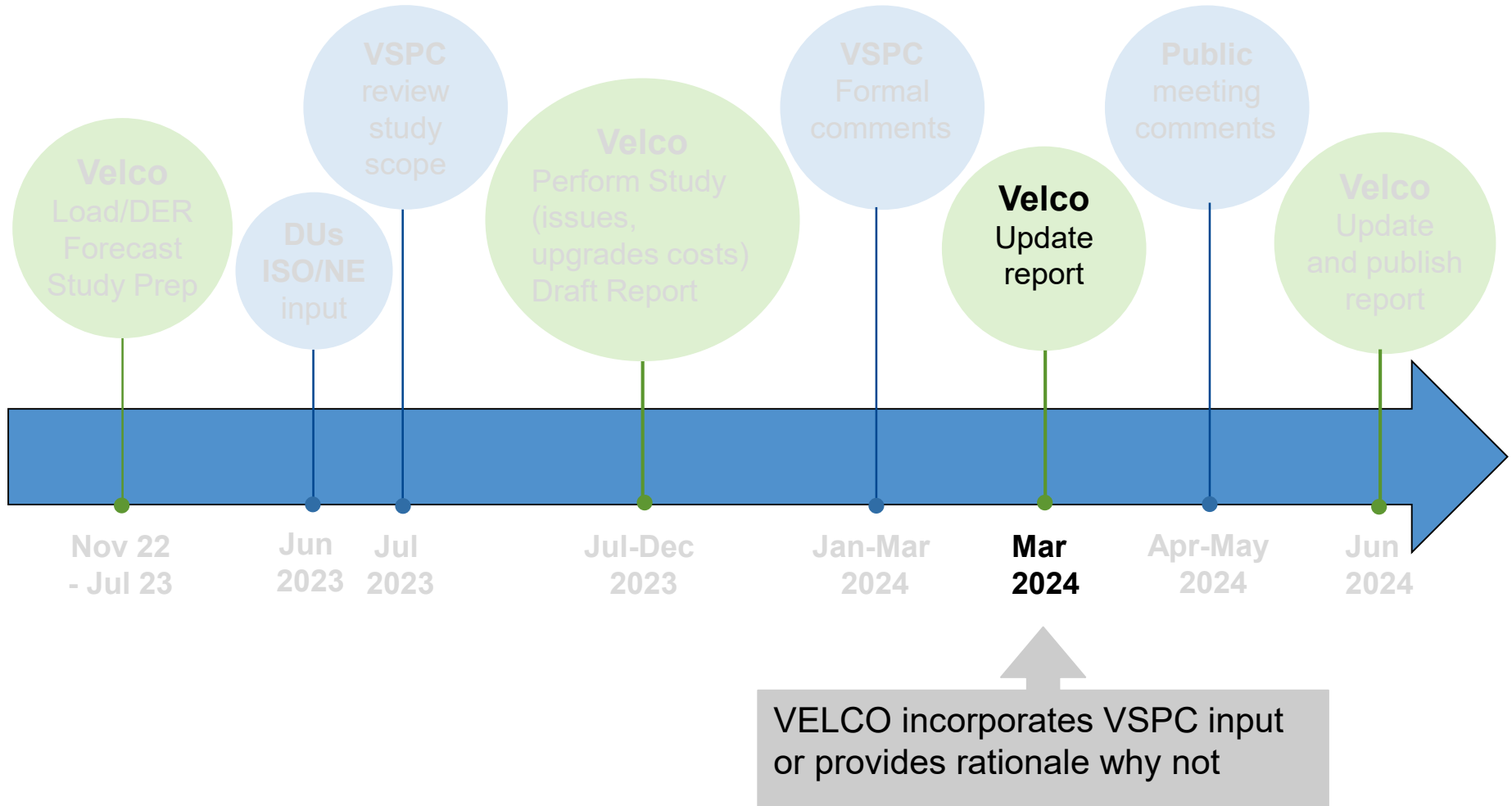


LRP Milestones

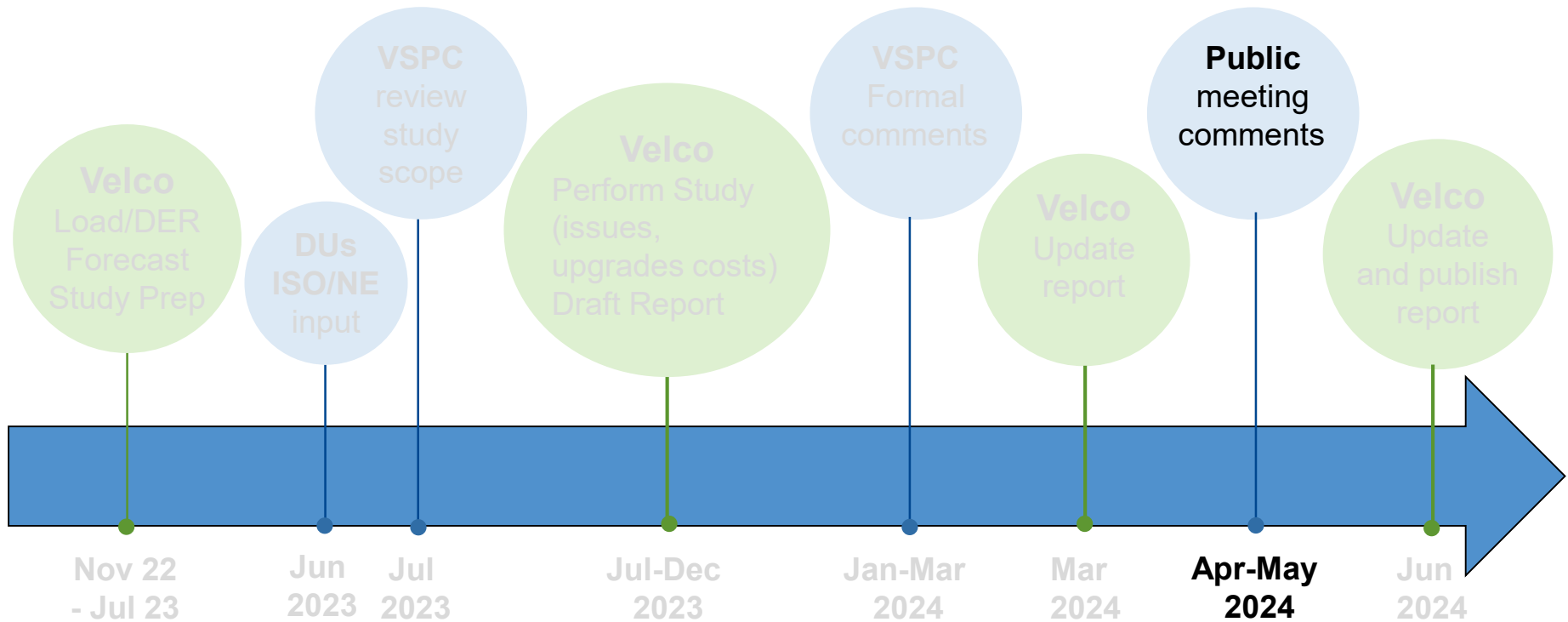


- \geq 60 day report review period
- Input on content
- Review of system level determinations and NTA screenings
- Formal memo of response to VELCO

LRP Milestones

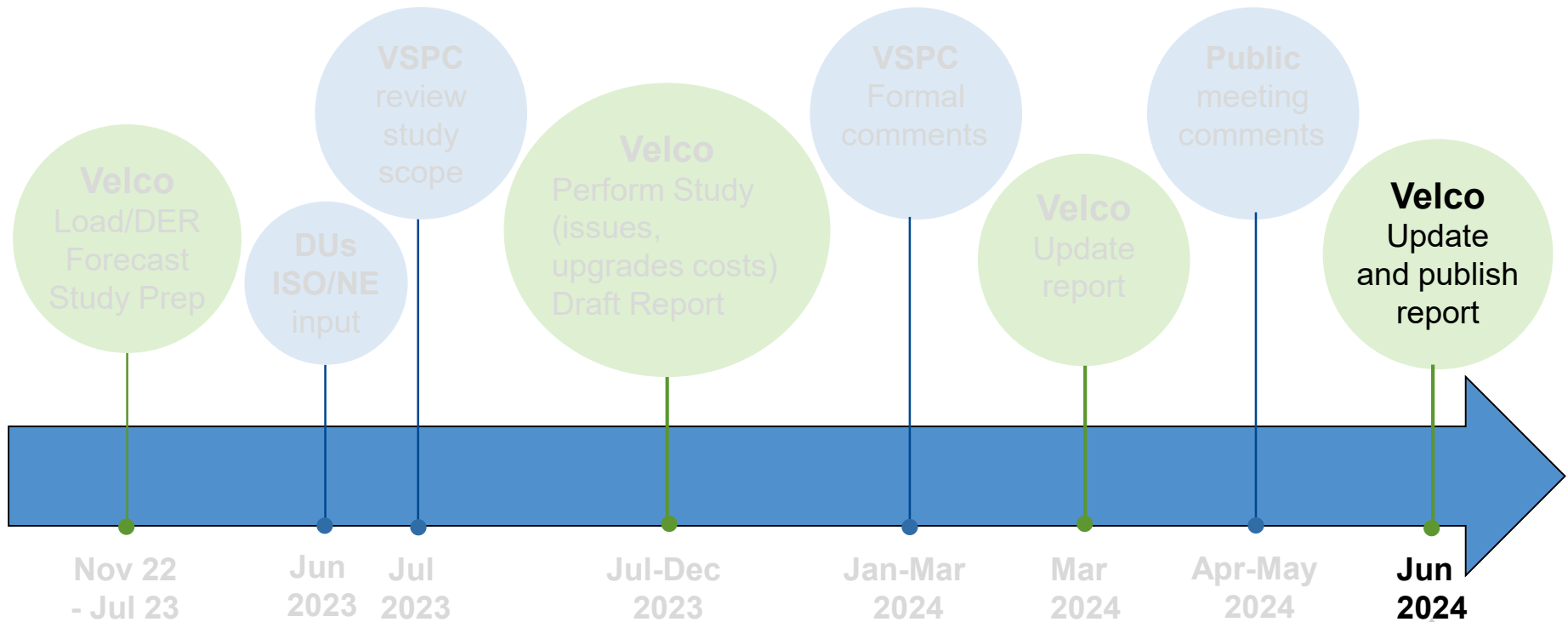


LRP Milestones



- At least 2 geographically diverse public meeting
- Public hearing in Montpelier
- Presentation to various parties as invited

LRP Milestones



- Compile public input
- Transcript of public comments required
- Send report to ISO-NE before publishing
- Non-CEII public document

2024 LRP STUDY SCOPE

Study Approach

- Forecast based on existing and expected trends, policies
 - High electrification load (EV, Heat pumps)
 - High DER
- Mitigate the high uncertainty of load/policies by modeling:
 - Different levels load scenarios
 - Various amounts of DER with low load
- Continue to use the VSPC geographical targeting subcommittee to identify areas where NTA can help mitigate issues
- Consider non-transmission alternatives (NTAs) e.g. battery storage

Study Assumptions

- Load Forecast (Itron)

- **Policy forecast:**

- 18k new heat pumps per year (VEIC mid range forecast)
 - 90% non-fleet vehicles are EV (VEIC high EV forecast)

- **Business as Usual (BAU) forecast**

- 10k new heat pumps per year (VEIC lower range forecast)
 - 50% non-fleet vehicles are EV (VEIC medium EV forecast)

- **ISO-NE forecast not used**

- EV lower than the VEIC high EV forecast
 - PV higher output at the ISO-NE Summer peak hour vs VT peak hour

Study Assumptions

- **Generation Dispatch**

- Summer Peak: 10% Hydro, 5% Wind, 0% Solar
- Winter Peak: 50% Hydro, 25% Wind, 0% Solar
- McNeil out of service
- Use new ISO-NE generation outage approach

- **DER modeling**

- 500 – 1300MW, 100 MW increments (double the PUC Renewable Energy Standard, Tier II)

- **Energy Storage**

- Not modeled (considered for mitigation solutions)

Study Assumptions

- Study Years

- 2033 and 2043

- Transfers

- NY-NE: 0 MW
- North-South: 2,000 MW
- West-East: 2,000 MW

- System Topology

- ISO-NE identified upgrades included
- Projects with a Vermont section 248 approval included
- No projects past 2028
- Elective Transmission Upgrades not included
 - 1000 MW HVdc at Coolidge substation, postponed twice
 - 400 MW HVdc at New Haven substation, withdrawn from ISO queue

Study Assumptions

- Extreme Weather Scenario
 - Low probability high impact events

Contingency Criteria

- NERC planning standard TPL-001-4
 - Category P0 (No outages)
 - Category P1 (Outage of one element such as line, trsf, gen)
 - Categories P2 to P7 (Outage of two or more elements)
- ISO-NE Planning Procedure No.3
 - N-0, N-1, N-k, N-1-1
- DU line outage
 - Entire line, breaker to breaker
 - Line end open
 - Radial lines
 - Pick up radial line, close N.O. switch

NERC = North American Electric Reliability Council

ISO-NE = Independent System Operator of the New England electric system

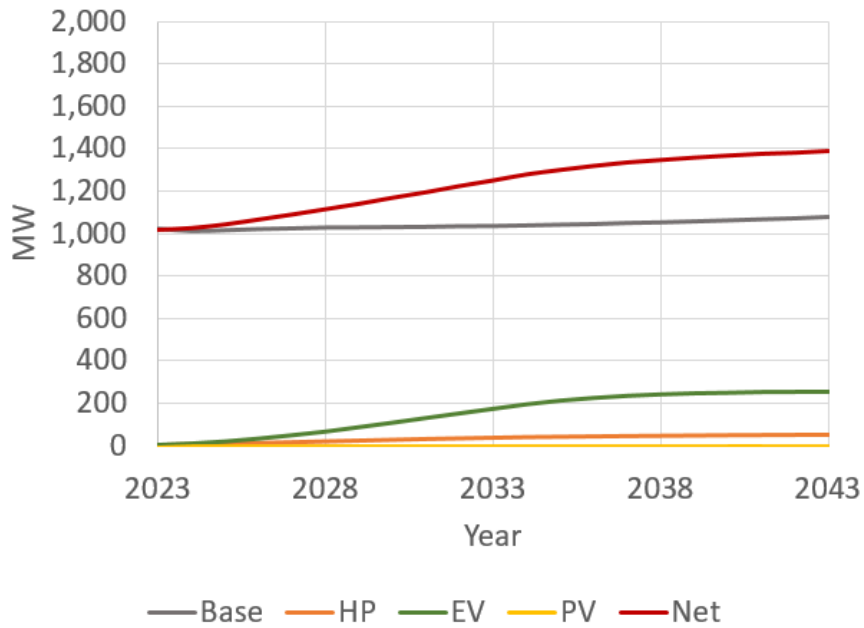
90/10 = 90% chance that the actual load will be at or lower than the forecast, 10% chance that it will exceed the forecast



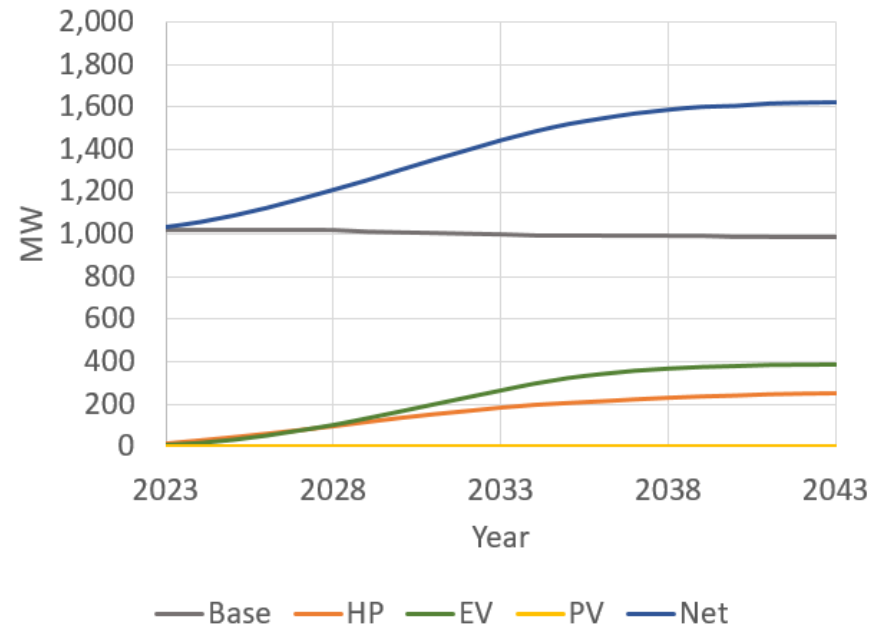
LOAD/DER FORECAST

Peak Load Forecasts – Policy Scenario

Summer Peak Load Forecast



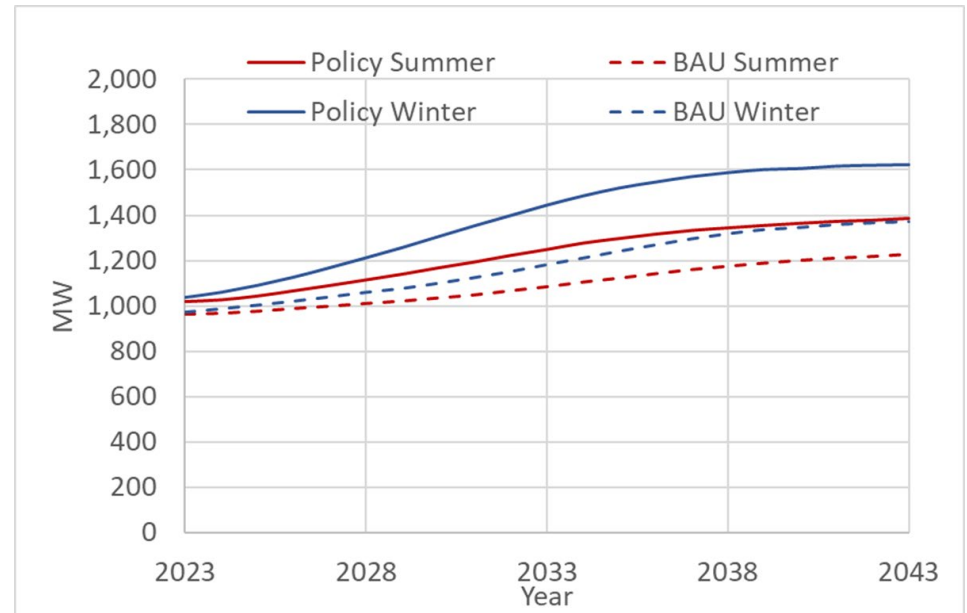
Winter Peak Load Forecast



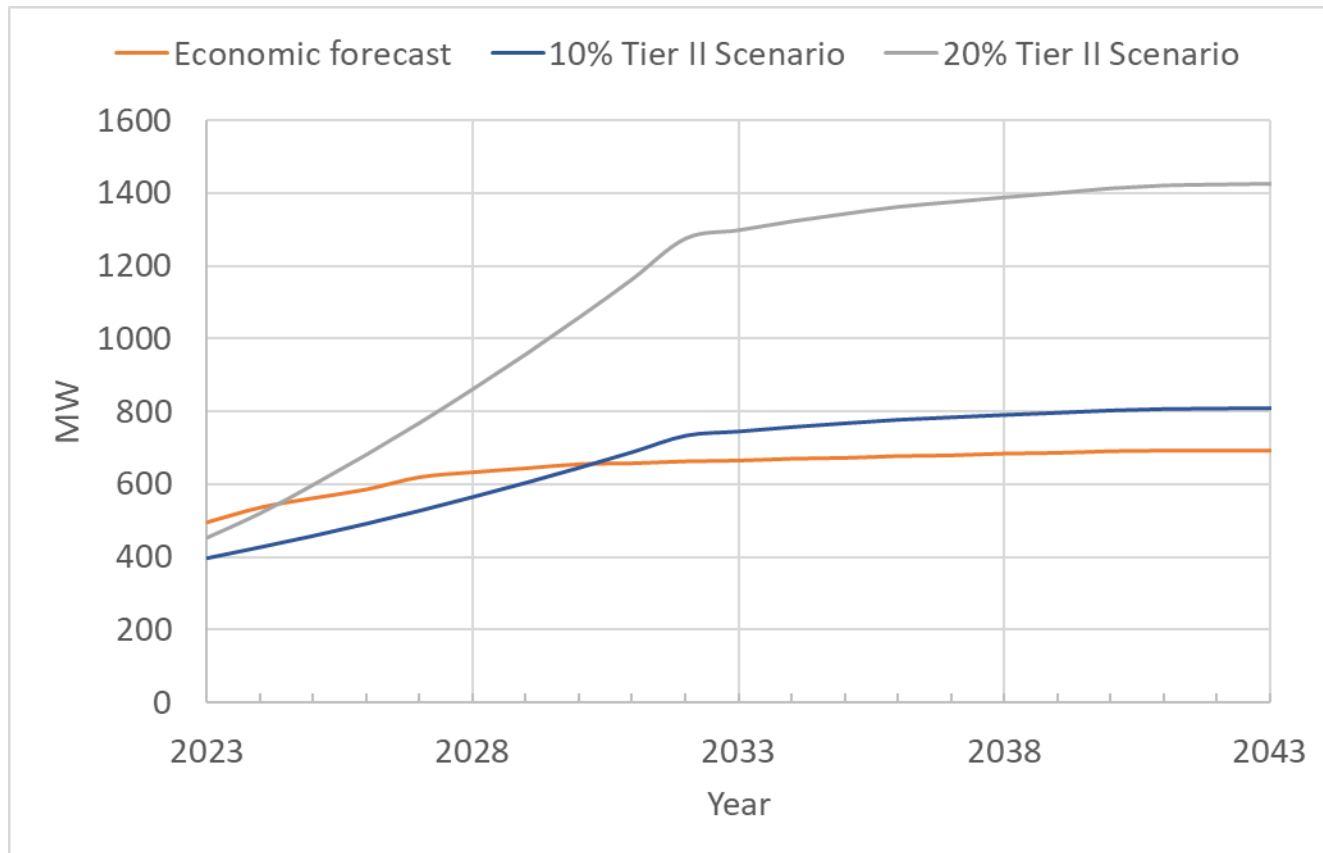
Technology forecasts do not include the effect of load control

Policy forecast vs. Business-as-usual forecast

- Policy (Expected forecast)
 - Annual sales of heat pumps increased from 10.5k to 17.9k by 2029
 - Non-fleet EVs grow to 90% share of registered vehicles by 2043
 - Fleet EVs 100% electrification between 2038 and 2045
- Business-as-usual (BAU)
 - Annual sales of heat pumps remain at 10.5k
 - Non-fleet EVs grow to 60% share of registered vehicles by 2043
 - Fleet EVs incremental increases remain constant at 2032 level through 2043



Solar PV forecast



Next Steps

- Please provide comments/questions by July 24th