

# 2022 EVERGREEN IRP UPDATED MODELING SCENARIOS

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JULY 29, 2022

# EVERGREEN IRP MODELING SCENARIOS

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The scope of the evergreen IRP modeling work is focused on the changes in the planning environment that have occurred since the completion of the 2020 IRP.

During the April 6<sup>th</sup> stakeholder session, NSPI identified areas of significant change and the corresponding key drivers to inform the modeling scenarios evaluated as part of the evergreen process.

Similar to the 2020 IRP, the three key drivers include:

- Carbon policy
- Electrification (Load Forecast)
- Resource Strategies

In addition, NS Power will be testing a series of sensitivities which reflect potential load, resource cost and availability scenarios.

NSPI received feedback from Stakeholders following the June 27<sup>th</sup> Stakeholder session to review the draft assumptions, modeling scenarios and early insights. Additional modeling scenarios, as referenced in the Stakeholder feedback responses, are captured in the proposed modeling scenario list.

# EVERGREEN IRP MODELING SCENARIOS

- NS Power has developed a series of key drivers and sensitivities, shown below
- These key drivers and sensitivities are then combined in to create scenarios to be modeled
- Not all possible combinations will be modeled; rather scenarios will be developed to inform a broad range of outcomes that can inform updates to the IRP Action Plan and Roadmap

Carbon Policy	Electrification	Resource Strategy	Sensitivities
Electricity Net Zero 2035	Current Policy and Trends	Atlantic Loop	Low-Cost Battery Storage Low-Cost Renewables
Electricity Net Zero 2050	Hybrid Peak Mitigation	No Atlantic Loop	DSM Scenarios Domestic Hydrogen Production No new firm imports Low/High Fuel and Power Prices* High Distributed Energy Resources Adjusted Available Timing – Atlantic Loop Wind Integration Constraint Relaxation

*\*Fuel and Purchased Power sensitivities will include varying Atlantic Loop energy costs, in order to evaluate an effective range of project costs*

# EVERGREEN IRP MODELING SCENARIOS

## KEY DRIVERS AND SENSITIVITIES

### Carbon Policy

- Net Zero Scenarios – achieve net zero electricity production by 2035 or 2050; net zero allows for limited emissions with the ability to offset emissions via credit mechanisms

### Electrification

- Load profiles reflective of electrification adoption toward the economy-wide net zero 2050 target (e.g. heating, transportation)
- Testing Two Scenarios:
  - Current Policy and Trends - reflects heat pump adoption based on current policy and trends
  - Hybrid Peak Mitigation – reflects a mix of heat pump adoption and retaining back up fuel heating for peak (cold weather) conditions; has the impact of reducing peak load requirements

Key Drivers	Notation
Carbon Policy	
Net Zero 2035	CE1
Net Zero 2050	CE2
Electrification	
Current Policy and Trends	E1
Hybrid Peak Mitigation	E2
Resource Strategy	
Atlantic Loop	R1
No Atlantic Loop	R2
Sensitivities	
Domestic Hydrogen Production	DH
No New Firm Imports	NF
Low Capital Cost Battery Storage	LB
Modified Mid DSM*	MMDSM
Base+ DSM*	BPDSM
Low Fuel and Power Prices	LFPP
High Fuel and Power Prices	HFPP
Low-Cost Renewables (Wind + Solar)	LR
High Distributed Energy Resources	HDER
Adjusted Available Timing – Atlantic Loop*	AAT
Wind Integration Constraint Relaxation*	WI

\*Updated

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## KEY DRIVERS AND SENSITIVITIES

### Resource Strategies

- The Atlantic Loop has been identified as a key lever to achieving 2030 carbon / RES targets and beyond

### Sensitivities:

- Domestic Hydrogen Production – additional flexible load and domestic hydrogen pricing
- No new firm imports – no new firm import commitments beyond existing resources
- Low-cost battery storage - reduced capital costs for storage
- Modified Mid DSM – Adjusted Mid DSM scenario, gradual increase from settlement plan to forecast
- Base+ DSM – scenario between Base and Modified Mid
- Low/High Fuel and Power Prices
- Low-Cost Renewables (Wind and Solar)
- Adjusted Available Timing – Atlantic Loop – Atlantic Loop is made available in 2035
- Wind Integration Constraint Relaxation – remove instantaneous penetration constraints

Key Drivers	Notation
Carbon Policy	
Net Zero 2035	CE1
Net Zero 2050	CE2
Electrification	
Current Policy and Trends	E1
Hybrid Peak Mitigation	E2
Resource Strategy	
Atlantic Loop	R1
No Atlantic Loop	R2
Sensitivities	
Domestic Hydrogen Production	DH
No New Firm Imports	NF
Low Capital Cost Battery Storage	LB
Modified Mid DSM*	MMDSM
Base+ DSM*	BPDSM
Low Fuel and Power Prices	LFPP
High Fuel and Power Prices	HFPP
Low-Cost Renewables (Wind + Solar)	LR
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Adjusted Available Timing – Atlantic Loop*	AAT
Wind Integration Constraint Relaxation*	WI

\*Updated

# DRAFT EVERGREEN IRP MODELING SCENARIOS LIST

Combining key drivers and sensitivities, NS Power has developed the following draft list of scenarios to be modeled:

Scenarios	Clean Energy Policy	Electrification	Resource Strategy	Sensitivities
CE1-E1-R1				Base
CE1-E1-R1-DH				Domestic Hydrogen
CE1-E1-R1-LFPP				Fuel and PP - Low
CE1-E1-R1-HFPP				Fuel and PP - High
CE1-E1-R1-MMDSM*	NZ2035	Current Policy and Trends	Atlantic Loop	Modified Mid DSM
CE1-E1-R1-BPDSM*				Base+ DSM
CE1-E1-R1-HDER				High Distributed Energy Resources
CE1-E1-R1-AAT*				Adjusted Available Timing – Atlantic Loop
CE1-E1-R1-WI*				Wind Integration Constraint Relaxation
CE1-E1-R2				Base
CE1-E1-R2-DH				Domestic Hydrogen
CE1-E1-R2-MMDSM*	NZ2035	Current Policy and Trends	No Atlantic Loop	Modified Mid DSM**
CE1-E1-R2-HDER*				High Distributed Energy Resources
CE1-E1-R2-NF				No Additional Firm
CE1-E2-R2				Base
CE1-E1-R2-LB/LR	NZ2035	Hybrid Peak Mitigation	No Atlantic Loop	Low-Cost Battery Storage/Low-Cost Renewables
CE1-E2-R2-MMDSM*				Modified Mid DSM
CE2-E1-R1	NZ2050	Current Policy and Trends	Atlantic Loop	Base
CE2-E1-R2				Base
CE2-E1-R2-DH	NZ2050	Current Policy and Trends	No Atlantic Loop	Domestic Hydrogen