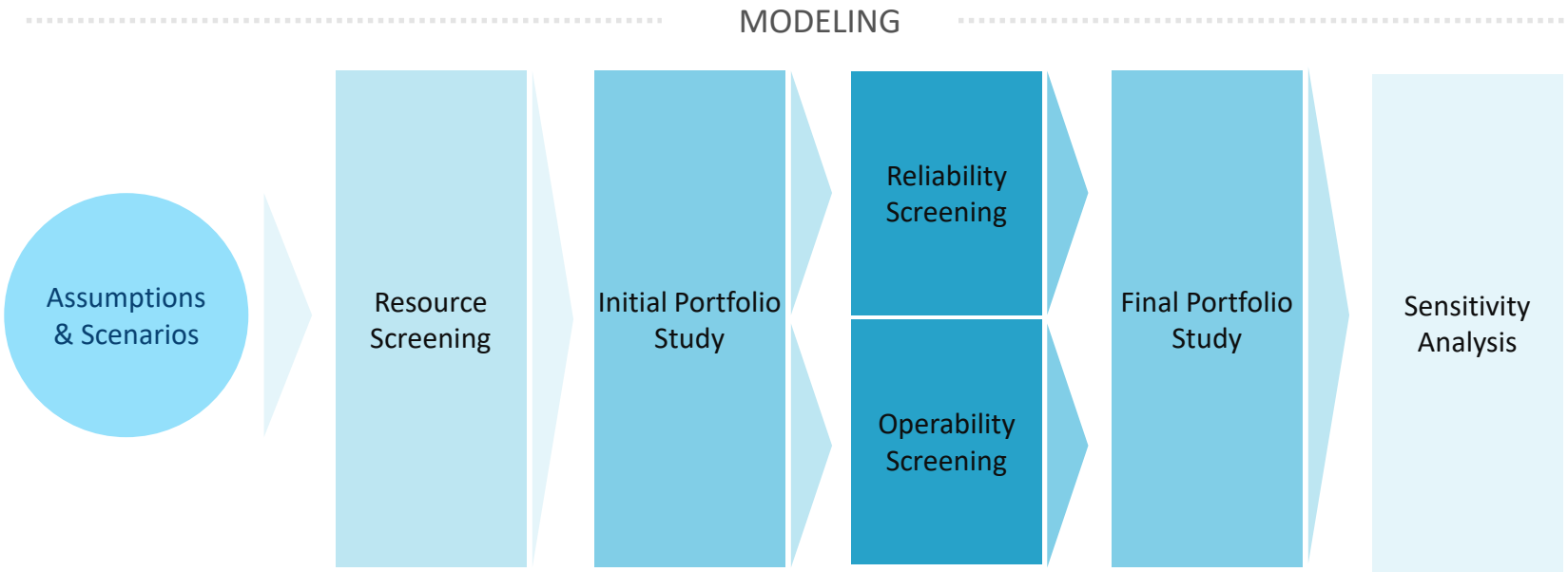
2020 IRP
SCENARIOS AND MODELING PLAN

FEBRUARY 27, 2020

Nova Scotia POWER
An Emera Company

IRP ANALYSIS: PROCESS OVERVIEW



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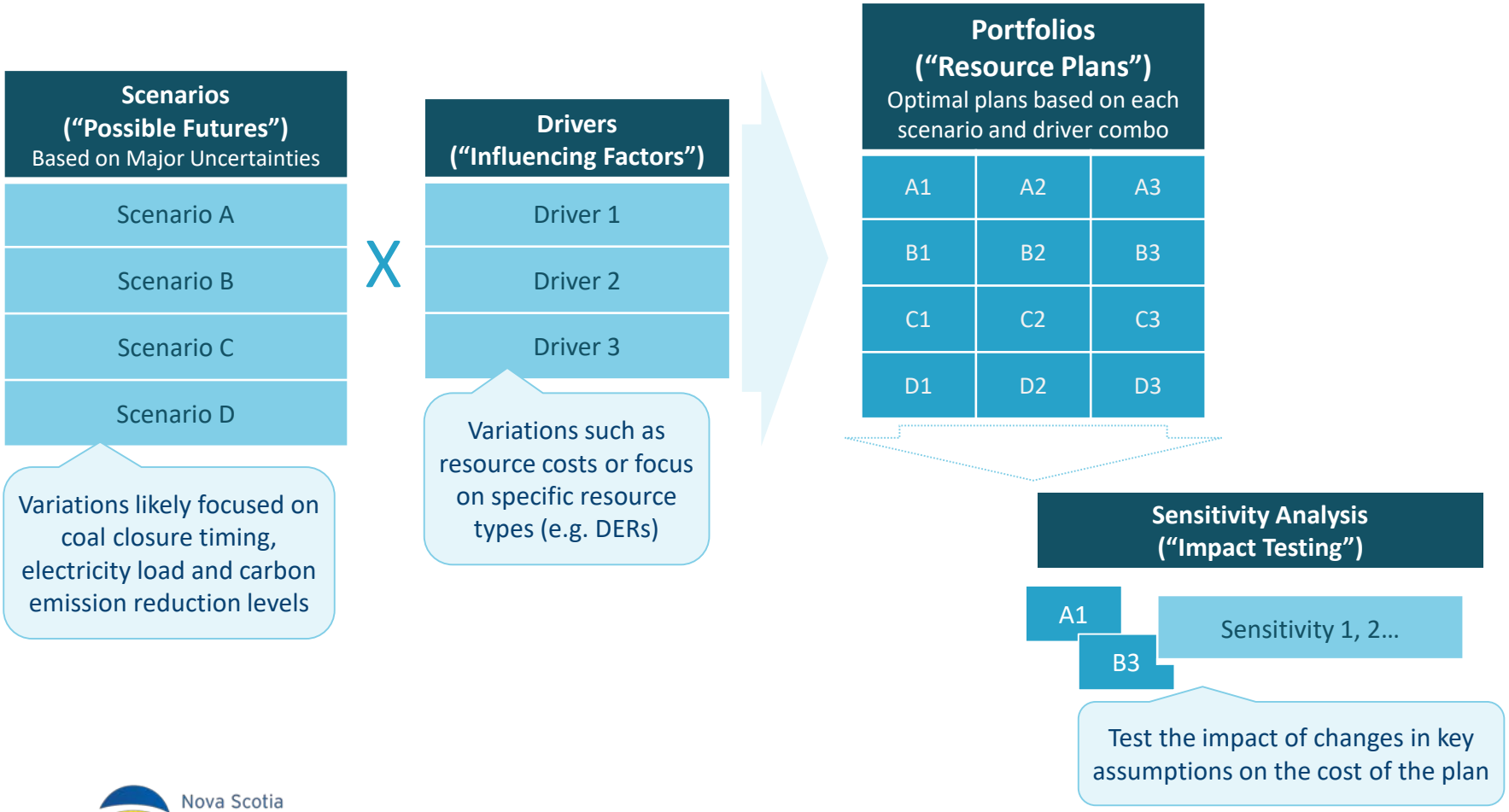
PORTFOLIO STUDY SCENARIO DEVELOPMENT APPROACH



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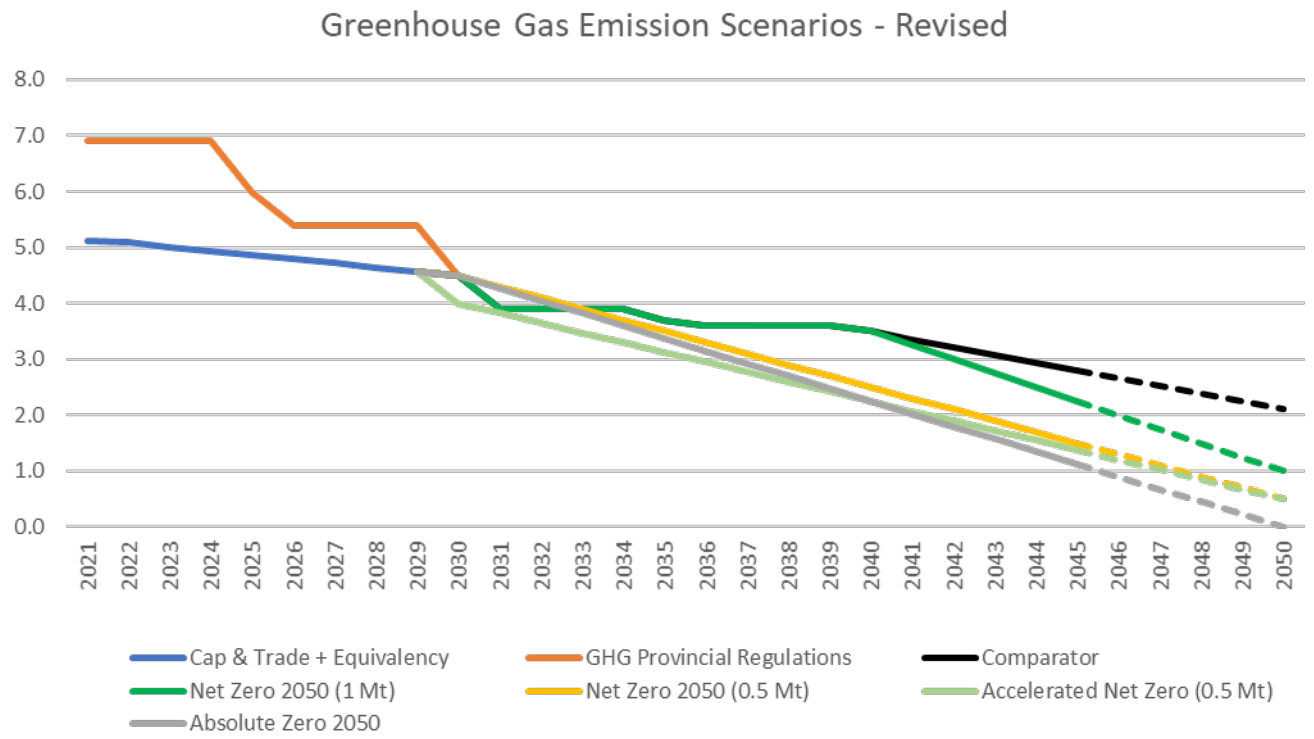
KEY POLICY DRIVERS

GREENHOUSE GAS EMISSIONS BY ELECTRICITY SECTOR

	CO2 2030	CO2 2040	CO2 2045	CO2 2050*
Comparator GHG Case	4.5	3.5	2.8	2.1
Reductions consistent with equivalency agreement and continued future decline	*(58% reduction from 2005)*	*(67% reduction from 2005)*	*(74% reduction from 2005)*	*(80% reduction from 2005)*
Net Zero 2050 (1 Mt)	4.5	3.5	2.3	1.0
Reduction to 1 Mt by 2050 (assumes achievement of "net zero" via mechanism)	*(58% reduction from 2005)*	*(67% reduction from 2005)*	*(78% reduction from 2005)*	*(91% reduction from 2005)*
Net Zero 2050 (0.5 Mt)	4.5	3.5	2.0	0.5
Reduction to 0.5 Mt by 2050 (assumes achievement of "net zero" via mechanism)	*(58% reduction from 2005)*	*(67% reduction from 2005)*	*(81% reduction from 2005)*	*(95% reduction from 2005)*
Accelerated Net Zero 2050 (0.5 Mt)	4.0	2.3	1.4	0.5
Reduction to 0.5 Mt by 2050 with acceleration of pace beginning in 2030	*(62% reduction from 2005)*	*(78% reduction from 2005)*	*(87% reduction from 2005)*	*(95% reduction from 2005)*
Absolute Zero 2050 (0 Mt)	4.5	2.3	1.1	0
Reduction to 0 Mt by 2050	*(58% reduction from 2005)*	*(78% reduction from 2005)*	*(90% reduction from 2005)*	*(100% reduction from 2005)*

KEY POLICY DRIVERS

GREENHOUSE GAS EMISSIONS BY ELECTRICITY SECTOR



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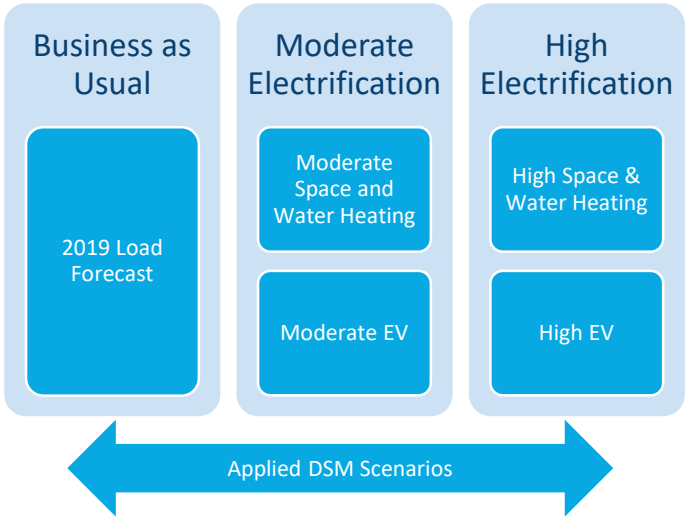
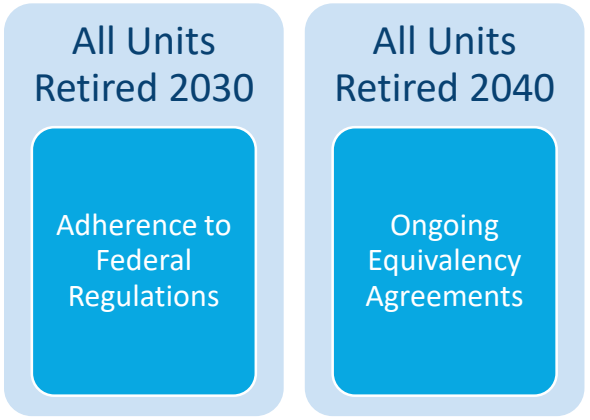
KEY POLICY DRIVERS

LOAD CHANGES



COAL CLOSURE POLICY



KEY SCENARIOS

	2050 GHG (MT)	Load Driver	Coal Closure
Comparator Case	2.1	BAU	2040
Net Zero – High Electrification	1.0	High Elec.	2040
Net Zero – Moderate Electrification (with Early Coal Closure)	0.5	Moderate Elec.	2030
Net Zero – Moderate Electrification	0.5	Moderate Elec.	2040
Absolute Zero World	0	Moderate Elec.	2030

Additional scenarios of interest to screen using RESOLVE include:

- Accelerated 0.5 Mt 2050 / Moderate Electrification / Coal End 2030
- Net Zero – 1 Mt 2050 / High Electrification / Coal End 2030
- Net Zero – 0.5 Mt 2050/ Business as Usual / Coal End 2040
- Net Zero – 0.5 Mt 2050 / Moderate Electrification / Coal End 2030

RESOURCE STRATEGIES

Current Landscape	Distributed Resources Promoted	Regional Integration	No New Emitting Resources
• New In-Province Resources (Supply & Demand) • No new Interconnections	• Distributed supply and demand resources are preferred where possible • DER are prioritized in the resource screening stage	• New In-Province Resources (Supply & Demand) • New Inter-connections and corresponding access to energy and capacity	• New in-province and imported supply and demand resources must be non-emitting

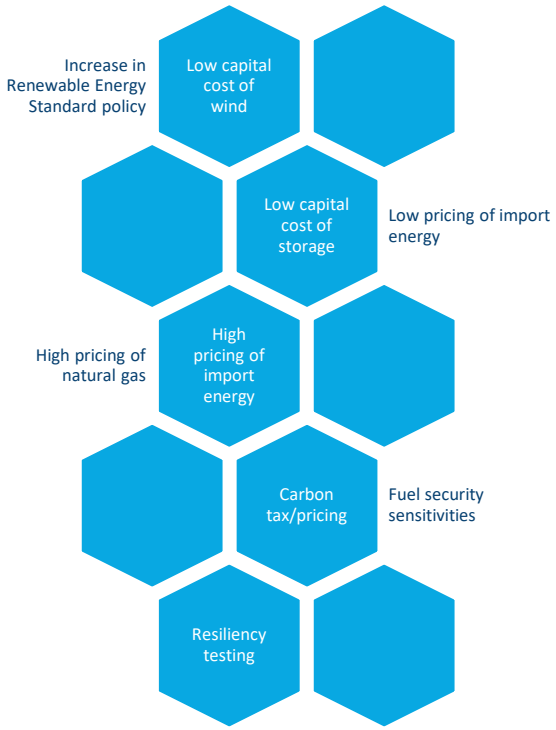
- Designed to ensure the IRP analysis covers key areas of importance / interest
- Serve to promote or limit certain resource options to allow them to be evaluated

KEY PAIRS: SCENARIOS & STRATEGIES

Scenario	Resource Strategy
Comparator Case	Current Landscape
Net Zero – High Electrification	Current Landscape
Net Zero – High Electrification	Distributed Resources Promoted
Net Zero – High Electrification	Regional Integration
Net Zero – Moderate Electrification	Current Landscape
Net Zero – Moderate Electrification	Distributed Resources Promoted
Net Zero – Moderate Electrification	Regional Integration
Net Zero – Moderate Electrification w/ ECC	Regional Integration
Absolute Zero World	Regional Integration
Absolute Zero World	No New Emitting Resources

- These pairs represent the proposed ten preliminary modeling runs to be conducted in Plexos LT in the Initial Portfolio Study Phase
- Additional combinations of scenarios and strategies can be tested using E3's RESOLVE model to assess if they should be included as a key modeling run

SENSITIVITY ANALYSIS



- Run against a resource portfolio to determine how it responds to changes in assumptions
- Prioritized with Stakeholders based on emerging insights from the ongoing analysis

PROPOSED EVALUATION CRITERIA

Metric	Description
Minimization of the cumulative present value of the annual revenue requirements over the planning horizon (adjusted for end-effects)	25 year NPV Revenue Requirement
Magnitude and timing of electricity rate effects	10 year NPV Revenue Requirement
Reliability requirements for supply adequacy	Evaluation of PRM, resource capacity adequacy, operating reserve requirements, etc.
Provision of essential grid services for system stability and reliability	Quantitative and qualitative assessment of the status of essential grid services provision for each portfolio.
Plan robustness (the ability of a plan to withstand plausible potential changes to key assumptions)	Magnitude of the plan's exposure to changes in key assumptions (via sensitivity analysis)
Reduction of greenhouse gas and/or other emissions	Mt of CO2 reduced over 25 years
Flexibility (limitation of constraints on future decisions arising from the selection of a particular path)	Qualitative assessment of timing of investments