

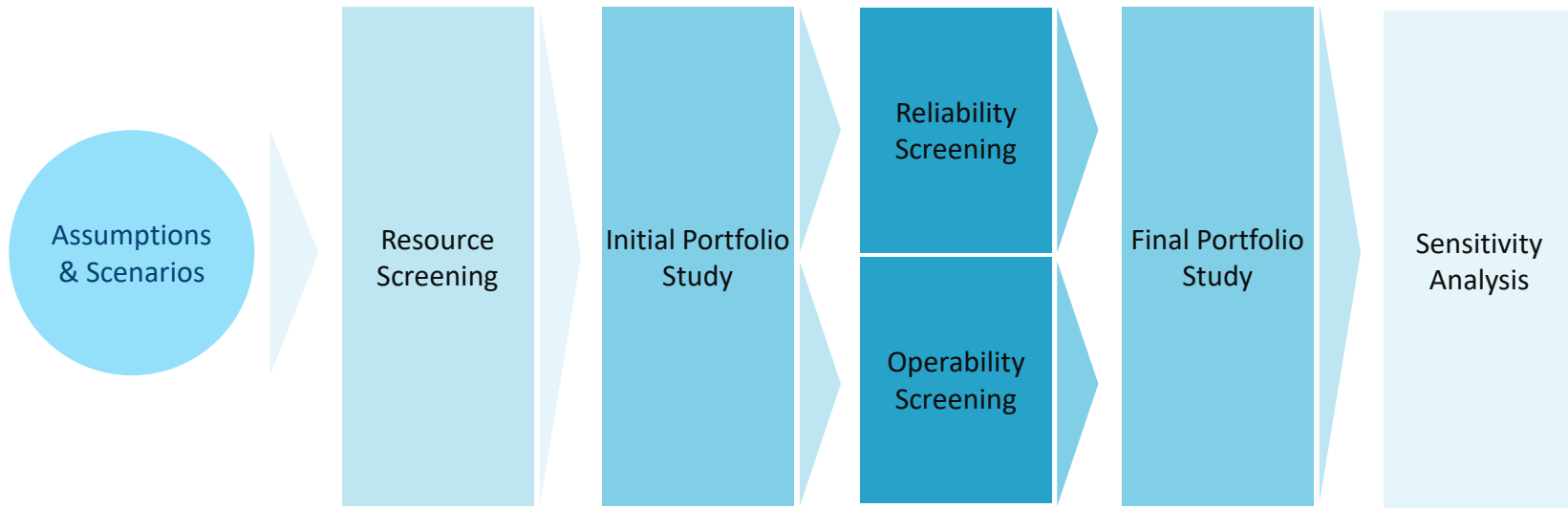
# 2020 IRP DRAFT ANALYSIS PLAN

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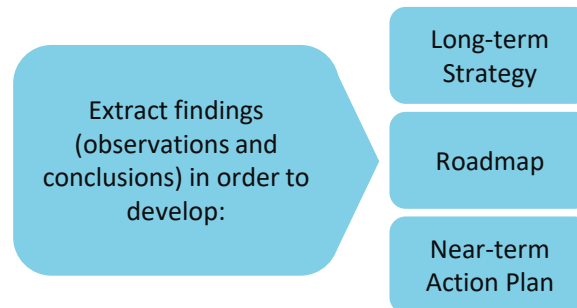
JANUARY 20, 2020

# IRP ANALYSIS: PROCESS OVERVIEW

## MODELING



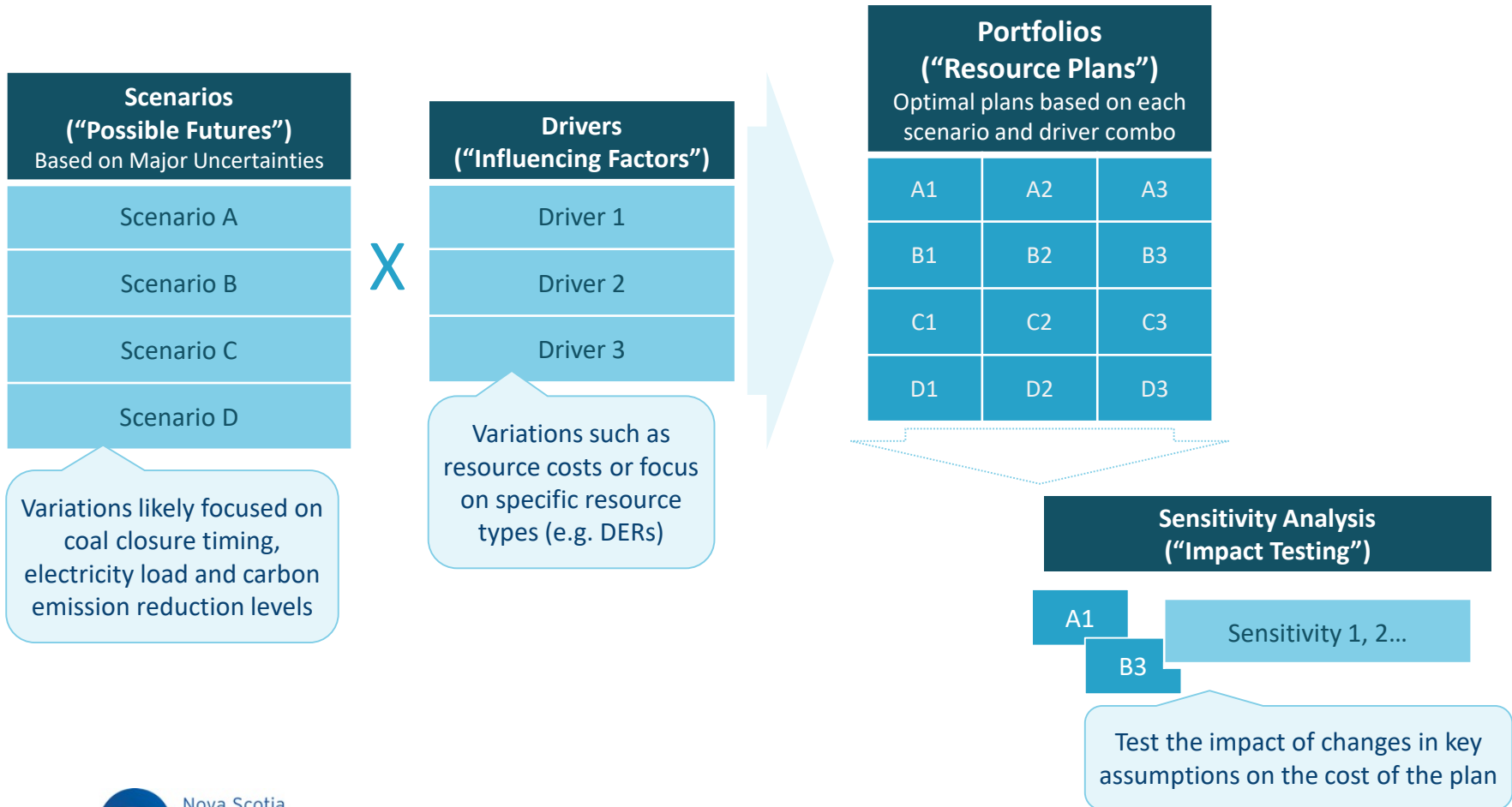
## POST-MODELING



# ANALYSIS PLAN: PHASE DESCRIPTIONS

Phase	Description
Resource Screening	Pare down candidate resources to be available to model in each scenario (this may differ by scenario). Combination of qualitative evaluation and/or quantitative modeling using E3's RESOLVE model.
Initial Portfolio Study	Conduct capacity expansion optimization modeling with Plexos LT (supplemented with E3's RESOLVE model where required), which will result in an economically optimized resource portfolio for each scenario (e.g. the resource plan with the lowest 25 year NPV revenue requirement for that scenario's set of assumptions).
Reliability Screening	For select scenarios, evaluate the impacts on reliability parameters, including the ELCC of renewables (and diversity benefits) and the required Planning Reserve Margin for particular resource portfolios using E3's RECAP model. Identify changes to these assumptions for iteration.
Operability Screening	For select scenarios, evaluate the production costs (e.g. fuel and purchased power) and dispatch constraints using the more granular Plexos MT/ST module. Identify changes required for the portfolio for iteration.
Final Portfolio Study	Using the output of the Reliability and Operability Screening phases, if required, conduct revised capacity expansion optimization modeling with Plexos LT (supplemented with E3's RESOLVE model where required).
Sensitivity Analysis	Using bookend values, as identified for each scenario, test the impact of future changes to key assumptions on the cost and performance of the portfolios.

# POTENTIAL “PORTFOLIO STUDY” SCENARIO DEVELOPMENT APPROACH



# 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; and,	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.