| Category   | Participant      | Comment  | NSP Response   |
|--|------------------|--|--|
| 1.0 Analysis Plan<br>General                             | E1 – Feb 14 2020 | Clarify at what steps plans are assessed for removal from consideration  | Please refer to the final Scenarios and Modeling Plan for additional details on the process and modeling phases.   |
|  |                  | Clarify data relationship among long term strategy, roadmap and action plan – will they be based on quantitative modelling findings  What process if emissions regulations are more stringent after IRP? How determine whether decision gate, and if so, how reassess plans? | NS Power will bring both qualitative insights and quantitative results from the modeling phases into the Roadmap and Action Plan  NS Power's approach to the 2020 IRP is to model a wide range of potential futures in order to identify options that are robust across many outcomes, including emissions profiles that are SDGA compliant and more   |
| 1.1 Analysis Plan<br>Evaluation Criteria<br>General      | E1 – Feb 14 2020 | How will evaluation criteria be measured, when will resource plans be screened, and what are screening criteria?   | stringent than current emissions limits.  NS Power confirms that NPV of Revenue Requirement will be the primary metric on which candidate resource plans are scored for a particular modeling scenario.  NS Power also considers other factors to be important which is why additional metrics have been proposed for qualitative consideration during the preparation of the Roadmap and Action Plan. |
| 1.2 Analysis Plan<br>Evaluation Criteria<br>Rate effects | E1 – Feb 14 2020 | Not clear how 10-year NPV revenue requirement assesses timing & magnitude of rate effects – show why important metric and whether best proxy   | To the extent that a shorter NPV period provides insight on near term rate effects, NS Power will consider this metric as one of the Evaluation Criteria used in the 2020 IRP.   |

| Category   | Participant           | Comment   | NSP Response   |
|--|-----------------------|---|--|
| 1.2 Analysis Plan Evaluation Criteria Rate effects                   | CA - Resource Insight | Revise to bill effects metric (customers more concerned about bills than rates):  • Allocate RRQ to customer classes w/ simplified  | NS Power will use the 10-year NPV evaluation criteria as a method of understanding near-term rate impacts of   |
|  |                       | allocation metric  Calculate average monthly bill by class based on forecast count and demand by class  | various resource portfolios.   |
| 1.3 Analysis Plan<br>Evaluation Criteria<br>Reliability requirements | E1 – Feb 14 2020      | Eliminate plans that do not meet reliability requirements  Confirm all metrics to be considered are listed on slide 4 row 3 or list all others  | NS Power agrees that plans which do not meet the standards of the Resource and Operability Screening phases will not be considered as viable resource portfolios.  |
|  |                       |   | NS Power's evaluation criteria are included in the Final Scenarios and Modeling Plan document.   |
| 1.3 Analysis Plan Evaluation Criteria Reliability Requirements       | Bates White           | The IRP should find the optimal reserve margin, not simply hard code PRMs into the model across a small number of scenarios.  Use modeling tools to test LOLE impact of different PRMs with goal of finding lowest PRM that still meets NPCC LOLE requirements. | The current PRM target was recently recalculated as part of the pre-IRP work as being the appropriate method to meet the 0.1 days/year reliability metric. NS Power will use the UCAP accounting method with ELCC contributions from Thermal and Hydro units, and then resolve back to ICAP during the Reliability and Operability Assessment phase of the modeling. Iteration will be possible if required to ensure that the PRM target is met; this may be particularly relevant for resource plans that are significantly different than the current system. |

| Category                   | Participant           | Comment   | NSP Response                                   |
|----------------------------|-----------------------|---|--|
| 1.4 Analysis Plan          | E1 – Feb 14 2020      | Eliminate plans at reliability/operability screening if | NS Power agrees that plans which do not        |
| <b>Evaluation Criteria</b> |                       | they do not meet requirements for essential grid        | meet the standards of the Resource and         |
| Essential grid services    |                       | services  | Operability Screening phases will not be       |
|                            |                       |   | considered as viable resource portfolios.      |
|                            |                       | Consider integration costs (additional/supp grid        |  |
|                            |                       | services) in cost of NPV                                | NS Power agrees and will be considering        |
|                            |                       |   | integration costs of wind at levels defined in |
|                            |                       | List grid services and evaluation criteria or           | the PSC Stability Study.                       |
|                            |                       | thresholds assigned to each                             |  |
|                            |                       |   | Examples of grid services to be considered in  |
|                            |                       |   | the Reliability and Operability Screening      |
|                            |                       |   | phases are listed in the final Assumptions     |
|                            |                       |   | document.                                      |
| 1.5 Analysis Plan          | E1 – Feb 14 2020      | Confirm if possible to combine plan robustness with     | Due to the number of potential sensitivities   |
| <b>Evaluation Criteria</b> |                       | 25-year NPV by assessing NPV rev req under high and     | requested by stakeholders, NS Power does       |
| Plan robustness            |                       | low sensitivity analysis                                | not believe that this combination would yield  |
|                            |                       |   | appropriate results to generate relative       |
|                            |                       |   | rankings of resource plans.                    |
| 1.5 Analysis Plan          | CA - Resource Insight | Calculate explicit measure of risk.                     | Risk elements are considered as part of the    |
| Evaluation Criteria        |                       |   | Plan Robustness evaluation which will          |
| Plan robustness            |                       | Consider using stochastic analytics capability to model | consider how resource portfolios perform       |
|                            |                       | financial risk or uncertainty re plan cost risk         | against different sensitivity assumptions.     |
|                            |                       |   |  |
|                            |                       | Use stochastic analysis capability to determine how     | NS Power will consider opportunities to run    |
|                            |                       | driver uncertainty affects portfolio cost; calculate    | stochastics if appropriate                     |
|                            |                       | risk/benefit ratio by comparing cost of greater than    |  |
|                            |                       | average cost outcomes with benefit of less than         |  |
|                            |                       | average cost outcomes                                   |  |
| 1.5 Analysis Plan          | E1 – Feb 14 2020      | Will NSP do stochastics and if so, on what variables?   | NS Power will consider opportunities to run    |
| Evaluation Criteria        |                       | How will end effects be handled?                        | stochastics if appropriate                     |
| Plan robustness            |                       |   |  |

| Category   | Participant           | Comment  | NSP Response   |
|--|-----------------------|--|--|
| 1.6 Analysis Plan Evaluation Criteria Emissions reduction  | E1 – Feb 14 2020      | Quantify / provide total emissions per plan  Consider total emissions per plan rather than reductions compared to a[n undefined] base case   | Total NS Power fleet emissions of CO <sub>2</sub> , Hg, NO <sub>x</sub> , and SO <sub>2</sub> under each plan will be considered and quantified.  NS Power is quantifying CO <sub>2</sub> reductions relative to 2005 actual emissions as a metric of reduction magnitude. |
| 1.7 Analysis Plan<br>Evaluation Criteria:<br>Flexibility   | E1 – Feb 14 2020      | How will qualitative assessment of timing of investments be used? Risk of pushing all decisions out 25 years and delaying benefits of grid modernization / emission reductions not captured in rev requirement   | NS Power will review the timing of capital investments in each plan to better understand the practicalities associated with their implementation.  |
| 1.7 Analysis Plan<br>Evaluation Criteria:<br>Flexibility   | E1 – Feb 14 2020      | Specify metric to evaluate DSM flexibility  Clarify how flexibility to be scored for DSM (incl. EE and DR)   | NS Power is not proposing to evaluate DSM flexibility as part of the evaluation criteria.  Timing of DSM investments will be considered along with capital spend timing in the qualitative evaluation of a given resource plan's flexibility.                              |
| 1.8 Analysis Plan<br>Evaluation Criteria<br>**New metric** | CA - Resource Insight | Add qualitative resiliency metric considering how leading portfolio alternative perform in two resiliency scenarios  Could use simple quantitative metrics to inform review, but judgment call because no good method for quantifying scenario probability | NS Power has added this consideration as part of the qualitative evaluation of Plan Robustness included in the final Scenarios and Modeling Plan document.   |
| 2.0 Scenarios<br>General                                   | CA - Resource Insight | Test "spliced" scenarios to see which portfolios most resilient  | NS Power will evaluate a number of Scenarios paired with different Resource Strategies and Sensitivities in order to evaluate a broad range of potential outcomes during the IRP process.  |

| Category      | Participant           | Comment  | NSP Response                                    |
|---------------|-----------------------|--|---|
| 2.0 Scenarios | CA - Resource Insight | Objective should be to spread out portfolios so each   | NS Power does not believe it would be           |
| General       |                       | portfolio tested under all scenarios.  | valuable to test all portfolios under all       |
|               |                       |  | scenarios, as some may be incompatible (e.g.    |
|               |                       |  | resource plan developed for a particular        |
|               |                       |  | scenario may not be able to serve the load      |
|               |                       |  | contained in another scenario). NS Power        |
|               |                       |  | will examine a broad range of outcomes as       |
|               |                       |  | part of this IRP and will focus sensitivity     |
|               |                       |  | analysis on the scenarios which show the        |
|               |                       |  | most commonality to all plans or have other     |
|               |                       |  | attributes of significant interest.             |
| 2.0 Scenarios | Natural Forces        | Should be recognition of risk premium  | Plan Robustness is a qualitative metric that    |
| General       |                       | (implementation risk) associated w/ different  | NS Power has included in the Evaluation         |
|               |                       | scenarios (reliance on new/unproven technology,  | Criteria in order to provide a mechanism to     |
|               |                       | ambitious DSM) - additional implementation risk and  | consider the risks associated with a particular |
| 200           |                       | risk of failure  | resource plan.                                  |
| 2.0 Scenarios | Synapse               | Determine capacity & unit commitment requirements  | The IRP Plexos model does not contain must      |
| General       |                       | in association w/ TUC to allow PLEXOS  | run requirements for TUC generation.            |
| 2000          | 54 March 6 2020       | parameterization for possible economic retirement.   | NC Decree and the Literature                    |
| 2.0 Scenarios | E1 – March 6 2020     | Should not conduct quantitative comparisons of   | NS Power agrees that it would not be            |
| General       |                       | revenue requirement across electrification scenarios   | consistent to directly compare the NPV of       |
|               |                       | because of incompatibility [plans occupying different  | Revenue Requirement associated with             |
|               |                       | scenarios do not compete against each other]   | serving different electrification scenarios.    |
|               |                       | Since utility costs of electrification will not be   |   |
|               |                       | Since utility costs of electrification will not be accounted for in revenue requirement, inappropriate |   |
|               |                       | to quantitatively compare resulting revenue  |   |
|               |                       | requirement between any two CRPs that rely on  |   |
| I             |                       | different electrification assumptions.   |   |
|               |                       | different electrification assumptions.   |   |
|               |                       |  |   |
|               |                       |  |   |

| Category   | Participant | Comment  | NSP Response   |
|--|-------------|--|--|
| 2.1 Scenarios<br>Drivers<br>GHG                  | Bates White | Include value of Cap & Trade allowances and capture NSP ability to sell allowances to net buyers.  Assume a value ≥\$20/tonne Cap & Trade allowance in   | NS Power will evaluate the value of selling GHG credits in the Nova Scotia cap and trade market as part of the Resource Screening stage. Additional details on the agreed  |
|  |             | modeling   | approach and pricing assumptions are available in the final IRP Assumptions.   |
| 2.1 Scenarios<br>Drivers<br>GHG                  | Synapse     | Suggested 3 additional carbon emissions path benchmarks:  • Baseline (aligned w/ NS Absolute Zero trajectory)  • Steeper path w/ zero emissions in 2045  EAC path of 1MT CO <sub>2</sub> by 2030   | NS Power has refined the proposed CO <sub>2</sub> e paths that will be modeled in the 2020 IRP based on stakeholder feedback.  |
| 2.1 Scenarios<br>Drivers<br>GHG                  | Synapse     | Incremental renewable energy amounts for Federal greening initiatives would accelerate renewable energy use. Bill 232 impacts pace of transitioning to greater renewable energy levels.  Consider whether further modeling parameterization may be necessary to address the Federal greening and Bill 232 initiatives. | This is addressed by the accelerated GHG reductions proposed in 2 of the 3 CO <sub>2</sub> curves which are designed to be SDGA compliant; this will drive increased levels of renewable or non-emitting generation without explicitly modeling the Federal Green Building Initiatives |
| 2.1 Scenarios<br>Drivers<br>GHG<br>Thermal Units | Synapse     | More stringent emissions criteria ("net zero"), avoidance of sustaining capital costs (as well as fuel and fixed & variable O&M costs), and cap & trade regulations could lead to optimal retirement outcomes within model.  | Additional consideration has been given to all 3 of these elements, as described in the final Assumptions Set.   |

| Category                 | Participant           | Comment   | NSP Response  |
|--------------------------|-----------------------|---|---|
| 2.1 Scenarios<br>Drivers | CA - Resource Insight | Generate very diverse portfolios for evaluation   | NS Power will evaluate a number of Scenarios paired with different Resource |
| GHG                      |                       | If portfolios perform well tested against other   | Strategies and Sensitivities in order to                                    |
|                          |                       | scenarios, infer resilient to natural disaster or sudden  | evaluate a broad range of potential   |
|                          |                       | carbon shifts   | outcomes during the IRP process.  |
|                          |                       |   | NS Power has also added Resiliency  |
|                          |                       |   | considerations as part of the qualitative                                   |
|                          |                       |   | evaluation of Plan Robustness included in the                               |
|                          |                       |   | final Scenarios and Modeling Plan document.                                 |
| 2.2 Scenarios            | E1 – February 14 2020 | Consider avoided T&D costs and how calculated in  | Avoided T&D costs will not be an input to the                               |
| Drivers                  |                       | order to avoid sub-optimal DSM amounts in IRP   | IRP model; methodology for estimating                                       |
| Load                     |                       |   | avoided T&D costs will be developed through                                 |
| Avoided T&D Costs        |                       |   | this IRP process.   |
| 2.2 Scenarios            | E1 – March 6 2020     | Avoided T&D costs part of separate process; NSP to  | Please see above  |
| Drivers                  |                       | calculate avoided T&D costs on narrower set of  |   |
| Load                     |                       | portfolios.   |   |
| Avoided T&D              |                       | Confirm consider TOD costs connect by colored value   |   |
|                          |                       | Confirm avoided T&D costs cannot be calculated using IRP model and will not be an input to IRP model. |   |
| 2.2 Scenarios            | E1 – February 14 2020 | How are municipal electrical utilities modeled? How   | Please refer to the 2019 Load Forecast for                                  |
| Drivers                  |                       | much load & peak demand in these forecasts and  | details on how municipal utility load has                                   |
| Load                     |                       | should there be any adjustments   | been forecasted; no adjustments have been                                   |
|                          |                       |   | made to this component of the IRP load                                      |
|                          |                       |   | forecast.   |
| 2.2 Scenarios            | E1 – March 6 2020     | Select one electrification scenario on basis of   | NS Power will evaluate a number of  |
| Drivers                  |                       | likelihood of each electrification scenario occurring;  | Scenarios paired with different Resource                                    |
| Load                     |                       | determination by E3 and NSP with opportunity for  | Strategies and Sensitivities in order to                                    |
|                          |                       | Stakeholder input   | evaluate a broad range of potential   |
|                          |                       |   | outcomes during the IRP process.  |

| Digby   Transmission grid (69 kV line) from Tremont to Yarmouth impedes area's ability to contribute to greening of environment & sustainable solutions   Sustainable solutions   Sustainable solutions  | Category      | Participant           | Comment  | NSP Response                                |
|--|---------------|-----------------------|--|---|
| Load T&D   | 2.2 Scenarios | Digby                 | Transmission grid (69 kV line) from Tremont to         | The capacity expansion modeling of the IRP  |
| T&D  2.2 Scenarios Drivers Load  Bates White  NSP to provide transparent forecast of peak load. 2019 10-YSO peak load forecast projected decrease in peak, but IRP scenarios show peak load growth, incl. significant growth for moderate & high electrification cases.  NSP should include costs of discretionary ratepayer-funded electrification, DSM and EE in modeling; costs should be considered variable for purposes of determining optimal resource portfolios.  NSP should should be considered variable for purposes of determining optimal resource portfolios.  NSP swer should explicitly address the effects of Port Hawkesbury Paper's load  CA - Resource Insight Drivers Load  Caritical to test mid-DSM and max achievable DSM pursuant to parameters in E1 Potential Study Drivers Load  Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  Confirmed  Confirmed  Confirmed  Confirmed  Confirmed  Confirmed  Confirmed  Confirmed  | Drivers       |                       | Yarmouth impedes area's ability to contribute to       |   |
| 2.2 Scenarios Drivers Load  Bates White  NSP to provide transparent forecast of peak load. Load  NSP to provide transparent forecast of peak load. 2019 10-YSO peak load forecast projected decrease in peak, but IRP scenarios show peak load growth, incl. significant growth for moderate & high electrification cases.  NSP should include costs of discretionary ratepayer-funded electrification, DSM and EE in modeling; costs should be considered variable for purposes of determining optimal resource portfolios.  NSP ower should explicitly address the effects of Port Hawkesbury Paper's load  NSP ower should explicitly address the effects of Port Hawkesbury Paper's load  CA - Resource Insight Drivers Load  CA - Resource Insight Consider Electrification of building & transportation Drivers Load  2.2 Scenarios Drivers Load  Synapse  Critical to test mid-DSM and max achievable DSM pursuant to parameters in E1 Potential Study Drivers Load  E1 - March 6 2020  Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  Confirmed  Part of specific project planning post-IRP. Please see the Assumptions slides for final load assumptions.  All costs of the electrification being considered in the IRP are being treated as exogenous to the model as agreed with Bates White.  All costs of the electrification sex exogenous to the model as agreed with Bates White.  PHP's interruptible load does not contribute to firm system peak. Their energy consumption will be modeled as part of the IRP.  Phe's interruptible load does not contribute to firm system peak. Their energy consumption will be modeled as part of the IRP.  Phe's interruptible load does not contribute to firm system peak. Their energy consumption will be modeled as part of the IRP.  Phe load forecast assumptions were informed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Please see the Final Scen | Load          |                       | greening of environment & sustainable solutions        | therefore candidate locations for new       |
| Drivers   Driv   | T&D           |                       |  | generation resources would be considered as |
| Drivers Load  2019 10-YSO peak load forecast projected decrease in peak, but IRP scenarios show peak load growth, incl. significant growth for moderate & high electrification cases.  NSP should include costs of discretionary ratepayer-funded electrification, DSM and EE in modeling; costs should be considered variable for purposes of determining optimal resource portfolios.  NS Power should explicitly address the effects of Port Hawkesbury Paper's load  CA - Resource Insight  Drivers Load  CA - Resource Insight  Consider Electrification of building & transportation  CA - Resource Insight  Consider Electrification of building & transportation  Critical to test mid-DSM and max achievable DSM pursuant to parameters in E1 Potential Study  Please see the Final Scenarios and Modeling Plan  Confirmed  Confirmed  Confirmed  |               |                       |  | part of specific project planning post-IRP. |
| Load   |               | Bates White           |  | · ·   |
| significant growth for moderate & high electrification cases.  All costs of the electrification being considered in the IRP are being treated as exogenous to the model as agreed with Bates White.  PHP's interruptible load does not contribute to firm system peak. Their energy consumption will be modeled as part of the IRP.  2.2 Scenarios Drivers Load  CA - Resource Insight Drivers Load  CA - Resource Insight Drivers Load  Cartical to test mid-DSM and max achievable DSM pursuant to parameters in E1 Potential Study Drivers Drivers Drivers Confirmed  Confirmed  Confirmed  Confirmed  Confirmed  Confirmed  Confirmed  Confirmed   |               |                       |  | load assumptions.                           |
| cases.  NSP should include costs of discretionary ratepayer- funded electrification, DSM and EE in modeling; costs should be considered variable for purposes of determining optimal resource portfolios.  2.2 Scenarios Drivers Load  CA - Resource Insight Drivers Load  Consider Electrification of building & transportation wide range of long-term outcomes in terms of both peak and energy requirements.  Casenarios Drivers Drive | Load          |                       | •                |   |
| exogenous to the model as agreed with Bates White.  NSP should include costs of discretionary ratepayer- funded electrification, DSM and EE in modeling; costs should be considered variable for purposes of determining optimal resource portfolios.  NS Power should explicitly address the effects of Port Hawkesbury Paper's load  CA - Resource Insight  Consider Electrification of building & transportation  Drivers Load  CA - Resource Insight  Consider Electrification of building & transportation  The load forecast assumptions were informed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Please see the Final Scenarios and Modeling Plan  Confirmed  Confirmed  |               |                       | significant growth for moderate & high electrification | _   |
| NSP should include costs of discretionary ratepayer- funded electrification, DSM and EE in modeling; costs should be considered variable for purposes of determining optimal resource portfolios.  2.2 Scenarios Drivers Load  CA - Resource Insight Drivers Load  CA - Resource Insight Consider Electrification of building & transportation Drivers Load  CA - Resource Insight Consider Electrification of building & transportation Drivers Load  Ca - Resource Insight Consider Electrification of building & transportation Drivers Load  Ca - Resource Insight Consider Electrification of building & transportation Drivers Load  Ca - Resource Insight Consider Electrification of building & transportation Drivers Load  Ca - Resource Insight Consider Electrification of building & transportation Drivers Load  Critical to test mid-DSM and max achievable DSM pursuant to parameters in E1 Potential Study Plan  Confirmed  Confirmed   |               |                       | cases.   | G   |
| funded electrification, DSM and EE in modeling; costs should be considered variable for purposes of determining optimal resource portfolios.  2.2 Scenarios Drivers Load  CA - Resource Insight Drivers Load  Consider Electrification of building & transportation Load  The load forecast assumptions were informed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Critical to test mid-DSM and max achievable DSM please see the Final Scenarios and Modeling Plan  Confirmed  Confirmed  Confirmed  Confirmed   |               |                       |  |   |
| should be considered variable for purposes of determining optimal resource portfolios.  2.2 Scenarios Drivers Load  CA - Resource Insight Drivers Load  CS Scenarios Drivers  Consider Electrification of building & transportation Drivers Load  CS Scenarios Drivers Load  CA - Resource Insight Drivers Load  COnsider Electrification of building & transportation Drivers Load  Critical to test mid-DSM and max achievable DSM Drivers Load  Critical to test mid-DSM and max achievable DSM Drivers Load  Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  Confirmed  Confirmed  Confirmed  Confirmed   |               |                       | •                | White.                                      |
| determining optimal resource portfolios.  2.2 Scenarios Drivers Load  CA - Resource Insight Drivers Load  Consider Electrification of building & transportation Wide ransper of long-term outcomes in terms of both peak and energy requirements.  Critical to test mid-DSM and max achievable DSM pursuant to parameters in E1 Potential Study  Drivers Load  E1 - March 6 2020 Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  CA - Resource Insight Drivers Drivers Consider Electrification of building & transportation Uniformed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Please see the Final Scenarios and Modeling Plan  Confirmed  Confirmed   |               |                       |  |   |
| 2.2 Scenarios Drivers Load  CA - Resource Insight Drivers Load  Consider Electrification of building & transportation In load forecast assumptions were informed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Please see the Final Scenarios and Modeling Plan  Drivers Load  Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  Confirmed  Confirmed  Confirmed  |               |                       | ·  |   |
| Drivers Load  CA - Resource Insight Drivers Load  Consider Electrification of building & transportation Load  Consider Electrification of building & transportation The load forecast assumptions were informed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Critical to test mid-DSM and max achievable DSM pursuant to parameters in E1 Potential Study  Please see the Final Scenarios and Modeling Plan  Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  Confirmed   |               | 2                     | • • •  |   |
| Load  CA - Resource Insight  Drivers Load  CA - Resource Insight  Consider Electrification of building & transportation  The load forecast assumptions were informed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  2.2 Scenarios  Drivers  Drivers  Drivers  Drivers  E1 - March 6 2020  Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  Consumption will be modeled as part of the IRP.  The load forecast assumptions were informed by the PATHWAYS work, which considers several electrification several electrifica |               | Bates White           | · · · ·  | ·   |
| CA - Resource Insight   Consider Electrification of building & transportation   The load forecast assumptions were informed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.    2.2 Scenarios   Drivers   Driver   |               |                       | Hawkesbury Paper's load                                | , ,   |
| 2.2 Scenarios Drivers Load  CA - Resource Insight Consider Electrification of building & transportation Load  CA - Resource Insight Consider Electrification of building & transportation Load  The load forecast assumptions were informed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  2.2 Scenarios Drivers Load  E1 - March 6 2020 Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  CA - Resource Insight The load forecast assumptions were informed by the PATHWAYS work, which considers several electrification  The load forecast assumptions were informed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Please see the Final Scenarios and Modeling Plan  Confirmed  Confirmed   | road          |                       |  | · · · · · · · · · · · · · · · · · · ·       |
| Drivers Load  Drivers Load  Considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Synapse  Critical to test mid-DSM and max achievable DSM pursuant to parameters in E1 Potential Study  Drivers Load  2.2 Scenarios Drivers  E1 – March 6 2020  Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  informed by the PATHWAYS work, which considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Please see the Final Scenarios and Modeling Plan  Confirmed   | 2.2.6         |                       |  |   |
| Load  Considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  2.2 Scenarios  Drivers  Load  2.2 Scenarios  Drivers  Load  E1 – March 6 2020  Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  Considers several electrification scenarios for the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Please see the Final Scenarios and Modeling Plan  Confirmed  Confirmed   |               | CA - Resource Insight | Consider Electrification of building & transportation  |   |
| the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  2.2 Scenarios Drivers Load  E1 – March 6 2020 Confirm Pathways agnostic regarding costs, Drivers  E1 – March 6 2020 Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  the Nova Scotia economy that produce a wide range of long-term outcomes in terms of both peak and energy requirements.  Please see the Final Scenarios and Modeling Plan  Confirmed  Confirmed  |               |                       |  | · · · · · · · · · · · · · · · · · · ·       |
| wide range of long-term outcomes in terms of both peak and energy requirements.  2.2 Scenarios Drivers Load  E1 – March 6 2020 Confirm Pathways agnostic regarding costs, privers Drivers  Wide range of long-term outcomes in terms of both peak and energy requirements. Please see the Final Scenarios and Modeling Plan Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  | LOad          |                       |  |   |
| 2.2 Scenarios Drivers Load  2.2 Scenarios Drivers Confirm Pathways agnostic regarding costs, Drivers Orboth peak and energy requirements. Please see the Final Scenarios and Modeling Plan Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification   |               |                       |  |   |
| 2.2 Scenarios Drivers Load  E1 – March 6 2020 Critical to test mid-DSM and max achievable DSM pursuant to parameters in E1 Potential Study Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  Please see the Final Scenarios and Modeling Plan  Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  |               |                       |  |   |
| Drivers Load  2.2 Scenarios Drivers Drivers  E1 – March 6 2020 Drivers  Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification  | 2.2 Scenarios | Synance               | Critical to test mid-DSM and may achievable DSM        |   |
| Load  2.2 Scenarios E1 – March 6 2020 Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification Confirmed  |               | Зупарзе               |  |   |
| 2.2 Scenarios E1 – March 6 2020 Confirm Pathways agnostic regarding costs, mechanisms and delivery entities for electrification Confirmed  |               |                       | parsault to parameters in ETT otential study           |   |
| Drivers mechanisms and delivery entities for electrification   | -             | F1 – March 6 2020     | Confirm Pathways agnostic regarding costs              | Confirmed                                   |
|  |               | LI Watch 0 2020       |  | Committee                                   |
|  |               |                       | medianisms and delivery entities for electrification   |   |

| Category        | Participant           | Comment   | NSP Response                                    |
|-----------------|-----------------------|---|---|
| 2.2 Scenarios   | E1 – March 6 2020     | It seems the best path forward for the 2020 IRP, given                            | Due to the complexity of modeling NS Power      |
| Drivers         |                       | the current data and desire to explore electrification                            | is not able to test all DSM profiles across all |
| Load            |                       | scenarios, is to allow the four DSM Potential Study                               | modeling scenarios. Please see the Scenario     |
|                 |                       | scenarios to be paired with the three electrification                             | and Modeling Plan for additional details on     |
|                 |                       | scenarios   | DSM sensitivities.                              |
| 2.2 Scenarios   | Synapse               | Availability of load management critical in addition to                           | DR will be modeled as outlined in the           |
| Drivers<br>Load |                       | peak period load reduction from EE.   | Assumptions slides.                             |
|                 |                       | Support inclusion of all cost-effective DR peak reductions in E1 potential study. |   |
| 2.2 Scenarios   | Synapse               | Use E1 Potential Study to inform costs and quantities                             | DSM Potential study is the source of DSM        |
| Drivers         | 3,                    | of DSM.   | assumptions used in the IRP                     |
| Load            |                       |   |   |
|                 |                       |   |   |
| 2.2 Scenarios   | CA - Resource Insight | Test all 4 DSM levels across all scenarios  | Due to the complexity of modeling NS Power      |
| Drivers         |                       |   | is not able to test all DSM profiles across all |
| Load            |                       |   | modeling scenarios. Please see the Scenario     |
|                 |                       |   | and Modeling Plan for additional details on     |
|                 |                       |   | DSM sensitivities.                              |
| 2.2 Scenarios   | E1 – March 6 2020     | Allow 4 DSM scenarios to be paired with 3   | Please see above                                |
| Drivers         |                       | electrification scenarios   |   |
| Load            |                       |   |   |
| 2.2 Scenarios   | Synapse               | Determine costs & achievable potential for peak-load                              | DR will be modeled as outlined in the           |
| Drivers         |                       | reducing DR, with specific cost & quantity curves to                              | Assumptions slides.                             |
| Load            |                       | allow for resource selection based on DSM resources                               |   |
| [GUO]           |                       | or scenario analysis using alternative peak load and                              |   |
|                 |                       | annual energy projections.  |   |
|                 |                       | Use Navigant achievable cost-effective DR in                                      |   |
|                 |                       | modelling   |   |

| Category            | Participant           | Comment   | NSP Response                                    |
|---------------------|-----------------------|---|---|
| 2.3 Scenarios       | Synapse               | Identify next candidates for coal retirement after      | NS Power agrees that the sequence of coal       |
| Drivers             |                       | LIN2. Rank order to identify best to worst economic     | unit retirements will be an output of the       |
| Coal Closure        |                       | performers. We anticipate this will occur following     | portfolio modeling phase.                       |
|                     |                       | the results of the modeling runs.                       |   |
| 2.5 Scenarios       | CA - Resource Insight | Instead of Scenario 2 – Net zero – high electrification | Please refer to the final Scenarios and         |
| Candidate Scenarios |                       | suggest:  | Modeling plan as well as the Final              |
|                     |                       |   | Assumptions for how stakeholder feedback        |
|                     |                       | Accelerated 1.0 Mt 2050; high electrification + higher  | on scenarios has been incorporated.             |
|                     |                       | industrial/marine demand / coal end 2030                |   |
|                     |                       |   | NS Power's intention is to test a broad range   |
|                     |                       | High electrification logical w/ coal phase-out          | of scenarios in the IRP modeling in order to    |
|                     |                       |   | capture the uncertainty of potential futures.   |
|                     |                       | Pathways excluded industrial & marine sectors from      |   |
|                     |                       | electrification or other load growth drivers but        | The IRP model will be able to retire coal units |
|                     |                       | technology trends will shift more industrial use to     | when economic; the Current Landscape            |
|                     |                       | electricity. Supply-side option development will also   | scenario with coal closure in 2040 will allow   |
|                     |                       | support electrification of marine vessels and other     | this option to be tested.                       |
|                     |                       | equipment. Marine load higher electrification w/ high   |   |
|                     |                       | load factors or off-peak charging.                      |   |
|                     |                       |   |   |
|                     |                       | Test early coal closure w/ current landscape strategy   |   |
|                     |                       | (not just renewable integration). Phasing out coal may  |   |
|                     |                       | otherwise be economic.                                  |   |

| Category                 | Participant | Comment  | NSP Response   |
|--------------------------|-------------|--|--|
| 3.0 Screening<br>RESOLVE | Bates White | RESOLVE modeling should be subject to same level of preview & disclosure as PLEXOS runs.                                     | NS Power will endeavour to use the same modeling inputs in both PLEXOS and RESOLVE in order to ensure consistency.   |
|                          |             | Confirm RESOLVE runs will use same assumptions as agreed on in this pre-IRP development process.                             | Inputs will be adjusted as required by the unique aspects of each modeling tool in order to ensure they are considered   |
|                          |             | Explain differences b/w RESOLVE runs, assumptions and scenarios from PLEXOS and what vetted by                               | appropriately.   |
|                          |             | stakeholders to date.  Disclose & explain results of RESOLVE modeling and allow time for review & discussion of results with | RESOLVE modeling results will be shared with Stakeholders as part of the Interim Modeling update and workshop.   |
|                          |             | Working Group and stakeholders before PLEXOS runs.   |  |
| 3.0 Screening<br>RESOLVE | Synapse     | Use consistent, transparent inputs and make RESOLVE data available for review  | NS Power will endeavour to use the same modeling inputs in both PLEXOS and RESOLVE in order to ensure consistency. Inputs will be adjusted as required by the unique aspects of each modeling tool in order to ensure they are considered appropriately. |
| 3.0 Screening<br>RESOLVE | Synapse     | Support use of RESOLVE to test whether different scenarios produce significantly different capacity expansion plans.         | NS Power agrees with this approach   |
| 3.0 Screening<br>RESOLVE | Synapse     | Compare economics of replacing existing CTs with newer fast-ramping generation.  Use RESOLVE to address this.                | Existing CT resources will be considered for economic retirement during the Resource Screening phase of the Modeling Plan.   |
|                          |             | USE RESULVE tO dudiess tills.  | NS Power will use RESOLVE to execute this analysis.  |

| Category      | Participant | Comment  | NSP Response                                   |
|---------------|-------------|--|--|
| 3.0 Screening | Synapse     | Incorporate shadow carbon price on incremental           | NS Power agrees and this will be considered    |
| RESOLVE       |             | emissions beyond NSP allocation and allowance sales      | during the Resource Screening phase;           |
|               |             | opportunity for any decreased NSP emissions.             | additional details have been shared with the   |
|               |             | Consider a floor price.                                  | IRP working group and are include in the final |
|               |             |  | Assumptions slides.                            |
| 3.1 Screening | Synapse     | Using RECAP to assess overall reliability of a portfolio | NS Power will use a UCAP (ELCC) method to      |
| Reliability   |             | may resolve issues that may arise about whether a        | calculate PRM during the 2020 IRP Capacity     |
| RECAP         |             | portfolio exhibits LOLE values greater or less than 0.1  | Expansion modeling. This will be reconciled    |
|               |             | days/year reliability/resource adequacy criteria; may    | to ICAP PRM and ELCC will be tested and        |
|               |             | prevent PLEXOS from overbuilding capacity resources.     | confirmed to meet the 0.1day/year LOLE         |
|               |             | Adjust PRM constraint or adjusting ELCC values as        | target during the Reliability and Operability  |
|               |             | inputs in PLEXOS.  | Screening phases of the Modeling Plan. If      |
|               |             |  | the PRM is significantly exceeded by a         |
|               |             |  | resource portfolio of interest, NS Power will  |
|               |             |  | iterate on the PRM constraint as needed and    |
|               |             |  | revalidate against reliability and operability |
|               |             |  | constraints.                                   |
| 3.1 Screening | Synapse     | There may be synergies between low levels of storage     | Diversity benefits of wind and storage or      |
| Reliability   |             | resource and high wind levels. Critical to use RECAP to  | solar and storage combinations will be         |
| RECAP         |             | ensure economically optimal mix of wind/storage          | considered in the PRM calculation.             |
|               |             | tested or considered.                                    | Additional detail is contained in the final    |
|               |             |  | Assumptions Slides. The model is free to       |
|               |             |  | select pairings of renewable resources and     |
|               |             |  | storage as part of the capacity expansion      |
|               |             |  | model in order to minimize NPVRR.              |
| 3.1 Screening | Dalhousie   | Need to show how grid resiliency modelled in             | Applicable reliability targets will be met by  |
| Reliability   |             | scenarios  | viable resource portfolios. Transmission &     |
|               |             |  | Distribution considerations for storm          |
|               |             |  | hardening and resiliency are not considered    |
|               |             |  | by the IRP model as it is in general not       |
|               |             |  | location specific.                             |

| Category      | Participant | Comment  | NSP Response                                   |
|---------------|-------------|--|--|
| 3.1 Screening | Synapse     | Iterate early to ensure LOLE targets not significantly   | NS Power will use a UCAP (ELCC) method to      |
| Reliability   |             | exceeded () for any optimized resource plan              | calculate PRM during the 2020 IRP Capacity     |
|               |             |  | Expansion modeling. This will be reconciled    |
|               |             |  | to ICAP PRM and ELCC will be tested and        |
|               |             |  | confirmed to meet the 0.1 day/year LOLE        |
|               |             |  | target during the Reliability and Operability  |
|               |             |  | Screening phases of the Modeling Plan.         |
| 3.1 Screening | Synapse     | Establish requirements to allow increased wind on the    | NS Power agrees and will not constrain the     |
| Reliability   |             | system looking at second NB tie line and assessment      | maximum amount of wind on the system           |
|               |             | of Tx system and related support services (for stability | during the Initial Portfolio Assessment.       |
|               |             | and voltage criteria).                                   | Increasing amounts of wind on the system       |
|               |             |  | will be tied to particular reliability         |
|               |             | Model unlimited wind runs, and potential 1000 MW         | requirements as detailed in the PSC Stability  |
|               |             | total. Discuss curtailment practices in PLEXOS.          | study (pre-IRP work). Resulting resource       |
|               |             |  | plans of interest will then be assessed during |
|               |             |  | the Reliability and Operability Screening      |
|               |             |  | phases of the Modeling Plan.                   |
| 3.1 Screening | Synapse     | Confirm that Tx and operating reserve requirements       | The IRP model will not include must run        |
| Reliability   |             | regarding TUC will be relaxed or eliminated in PLEXOS.   | requirements for TUC related to transmission   |
|               |             |  | flows. Operating reserve requirements are      |
|               |             |  | not tied to specific generating units on the   |
|               |             |  | system.  |
| 3.1 Screening | Synapse     | Determine lowest PRM to meet NPCC requirements           | NS Power will use a UCAP (ELCC) method to      |
| Reliability   |             | rather than assessing whether 20% is compliant.          | calculate PRM during the 2020 IRP Capacity     |
|               |             |  | Expansion modeling. This will be reconciled    |
|               |             | Assess reliability and economics for a range of PRMs.    | to ICAP PRM and ELCC will be tested and        |
|               |             |  | confirmed to meet the 0.1day/year LOLE         |
|               |             | Use iterative techniques to address this issue.          | target during the Reliability and Operability  |
|               |             |  | Screening phases of the Modeling Plan.         |
| 3.1 Screening | Synapse     | Runs with and without NB intertie may require review     | NS Power agrees and plans to consider this     |
| Reliability   |             | to ensure reliability and operational stability.         | during the Reliability and Operability         |
|               |             |  | Screening phases of the Modeling Plan.         |
|               |             | To be discussed as runs developed.                       |  |

| Category          | Participant           | Comment  | NSP Response                                  |
|-------------------|-----------------------|--|---|
| 4.0 Strategies    | CA - Resource Insight | Why test only one strategy under comparator case?    | Since the Comparator case is non-compliant    |
| General           |                       | Provide information re relative performance of       | with the SDGA, NS Power does not believe it   |
|                   |                       | several resource strategies under current policy     | would add value to consider additional        |
|                   |                       | scenario   | Resource Strategies under the Comparator      |
|                   |                       |  | scenario. NS Power has added Scenario 2.0     |
|                   |                       |  | which combines a Low Electrification load     |
|                   |                       |  | with an SDGA compliant GHG trajectory         |
|                   |                       |  | which will be tested against both the Current |
|                   |                       |  | Landscape and Regional Integration resource   |
|                   |                       |  | strategies.                                   |
| 5.0 Portfolios    | E1 – February 14 2020 | Request a preferred resource plan as directed by     | In their subsequent comments on March 6       |
|                   |                       | UARB in 2014 IRP                                     | 2020 E1 stated they "recommend[s] that NS     |
|                   |                       |  | Power select one electrification scenario on  |
|                   |                       | Preferred resource plan necessary to calculate DSM   | the basis of perceived likelihood of each     |
|                   |                       | avoided energy & capacity costs                      | scenario occurring. This determination        |
|                   |                       |  | should be made by NS Power and E3, with       |
|                   |                       |  | opportunity for comment and input from        |
|                   |                       |  | Stakeholders. NS Power then select a PRP      |
|                   |                       |  | from within the 'most likely' electrification |
|                   |                       |  | scenario. E1 believes the above to represent  |
|                   |                       |  | a fair and transparent means of PRP           |
|                   |                       |  | selection."                                   |
|                   |                       |  | This appears to be a reasonable approach      |
|                   |                       |  | and will continue to discuss with             |
|                   |                       |  | stakeholders as the modeling phase            |
|                   |                       |  | progresses.                                   |
| 6.2 Sensitivities | Bates White           | Since Mersey cap ex vetted through IRP, at least one | NS Power will include a sensitivity run which |
| Mersey            |                       | set of PLEXOS runs should exclude Mersey             | assumes the Mersey system to be retired       |
|                   |                       | expenditures   | (with associated decommissioning costs)       |

| Category                             | Participant           | Comment   | NSP Response  |
|--------------------------------------|-----------------------|---|---|
| 6.4 Sensitivities<br>No New Emitting | Synapse               | Establish requirements to allow increased wind on the system looking at second NB tie line and assessment of Tx system and related support services (for stability and voltage criteria).  Model unlimited wind runs, and potential 1000 MW total. Discuss curtailment practices in PLEXOS. | NS Power agrees and will not constrain the maximum amount of wind on the system during the Initial Portfolio Assessment. Increasing amounts of wind on the system will be tied to particular reliability requirements as detailed in the PSC Stability study (pre-IRP work). Resulting resource plans of interest will then be assessed during the Reliability and Operability Screening phases of the Modeling Plan. |
| 6.4 Sensitivities No New Emitting    | Synapse               | Support relaxation of any limitations of Plexos to choose economic levels of new wind (even beyond 1000 MW)   | Agree – Plexos will not have hard constraints on quantities of wind but will pair them with the integration strategies identified in the PSC Renewable Integration study.   |
| 6.4 Sensitivities<br>No New Emitting | CA - Resource Insight | No new emitting might be better tested as sensitivity rather than distinct strategy. See what new emitting resources arise from modeling runs and apply as portfolio sensitivity to runs to see what non-emitting alternative is.   | NS Power agrees with this approach and has made this adjustment in the final Scenarios and Modeling Plan.   |
| 6.5 Sensitivities Pricing            | CA - Resource Insight | Consider sensitivity for price paid for power exported from NS. Model to follow import price? Will there be significant exports (> Tx and wind)?  | NS Power's base assumption is that due to the correlated nature of wind in the Maritimes, times of peak generation (and most significant opportunity for exports) will be correlated with times of peak generation in neighbouring jurisdictions, depressing any export prices.   |