

1 **Introduction**

2 On February 14th, 2020, NS Power released a study conducted by Energy+Environmental
3 Economics (“E3”) titled “Deep Decarbonization in Nova Scotia: Phase 1 Report”, as well as a
4 document titled “Draft Scenarios & Modeling Plan”. EfficiencyOne understands the E3 document
5 (referred to as the “Decarbonization Study”) is intended to inform electrification assumptions in
6 the IRP, and that the Draft Scenarios document provides an indication of what scenarios may be
7 modeled in the IRP.

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9 EfficiencyOne offers its comments on these two documents in the following sections of this
10 submission, which should be considered as additional and incremental with respect to the
11 comments submitted by EfficiencyOne on February 14th, 2020.

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13 EfficiencyOne’s recommendations are summarized as:

- 14 1. Quantitative comparisons of revenue requirements across electrification “scenarios” not be
15 conducted due to incompatibility.
- 16 2. NS Power select one electrification scenario on the basis of perceived likelihood of each
17 electrification scenario occurring.
- 18 3. NS Power select a Preferred Resource Plan from within the ‘most likely’ electrification
19 scenario (electrification is included in the 2019 NS Power Load Forecast and
20 EfficiencyOne considers it to be one of the electrification scenarios along with moderate
21 and high).
- 22 4. NS Power confirm E1’s understanding of modifications to the 2019 load forecast based on
23 the items outlined in section 1.3.
- 24 5. NS Power confirm E1’s understanding of electrification assumptions based on the items
25 outlined in section 2.0.
- 26 6. NS Power confirm that the levels of achievable, cost effective EE and DR in the 2019 DSM
27 Potential Study are likely underestimated for the electrification scenarios being considered
28 in the IRP, as E1’s Potential Studies are based on levels of electrification assumed in NS
29 Power’s 2019 Load Forecast.
- 30 7. The suggested EE and DR pairings represented in Table 1 form the EE and DR scenarios
31 for the 10 cases as proposed.

- 1 8. Enhanced analysis take place for EE and DR combinations contained within high-
2 performing Candidate Resource Plans, with the consultation of EfficiencyOne.
3 9. NS Power confirm EfficiencyOne’s understanding of how T&D avoided costs will be
4 addressed.
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7 **1.0 E3 Pathways Report: Electrification Scenarios**

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9 **1.1 Purpose of Electrification Scenarios**

10 Following the filing of NS Power’s 2019 Load Forecast on April 30, 2019, the NS Government
11 (“the Province”) passed the *Sustainable Development Goals Act* (SDGA), which includes a goal
12 of achieving net zero greenhouse gas (GHG) emissions by 2050. The degree to which
13 electrification will be used in a Provincial strategy to achieve this economy-wide goal is unknown.
14 EfficiencyOne understands that NS Power did not consider the electrification assumptions in their
15 2019 Load Forecast (e.g. electric vehicles, solar, heat pumps etc.) to be at the level required to
16 meet the subsequent provincial net zero by 2050 goal. In other words, NS Power is assuming that
17 in order for the Province to meet their SDGA goals, electrification in significantly higher levels
18 than was assumed in the 2019 Load Forecast may be required. EfficiencyOne agrees with the
19 examination of higher levels of electrification, given the uncertainty around how SDGA legislation
20 will be translated into GHG regulations for the electricity system. EfficiencyOne understands that
21 NS Power intends to treat electrification as a load modifier in the 2020 IRP using the electrification
22 scenarios outlined in E3’s Decarbonization study.
23

24 As currently planned, NS Power intends to model various levels of electrification without
25 considering any related utility costs. The electrification scenarios developed in E3’s
26 Decarbonization study are essentially “scenarios” within which NS Power will explore different
27 generation, energy efficiency (EE) and demand response (DR) resource options. As Synapse
28 correctly pointed out at the Feb 27 technical conference, since the utility costs of electrification
29 will not be accounted for in the Revenue Requirement, it would be inappropriate to quantitatively
30 compare the resulting revenue requirements between any two CRPs that rely on different
31 electrification assumptions. EfficiencyOne agrees with Synapse that comparability will be

1 problematic across different electrification scenarios, as the partial revenue requirements will
2 exclude any electrification program administration and incentive costs as well as transmission and
3 distribution costs, which are expected to vary significantly between electrification scenarios. It
4 will also exclude costs that are external to the electricity system (e.g. federal incentives), which
5 are different for each electrification scenario, and likely necessary to achieve the GHG targets the
6 electrification scenarios were designed to achieve.

7
8 EfficiencyOne recommends:

- 9
- 10 • Quantitative comparisons of revenue requirements across electrification scenarios not
11 be conducted, as the comparisons will be not be meaningful since any two plans
12 occupying different “Scenarios” do not truly compete against each other.
- 13

14 ***1.2 Selecting a Lowest-Cost Plan for DSM Purposes***

15 Given that EfficiencyOne requires a single avoided cost value for each of energy and capacity, as
16 stated in previous comments, the selection of a single Preferred Resource Plan (PRP) (i.e a CRP
17 with the lowest 25-year Revenue Requirement) is an essential IRP activity for EfficiencyOne.
18 Through the 2014 IRP the NSUARB reinforced the importance of choosing a single PRP against
19 which future decisions can be compared, calling it “the whole point of the exercise”.¹

20
21 While EfficiencyOne recognizes the value of modelling differing electrification scenarios, it
22 should be noted that this modelling decision seems likely to complicate the selection of a PRP.
23 Since the IRP will consist of three different electrification scenarios (including the reference
24 electrification scenario), there will essentially be three PRPs, with each representing the highest-
25 ranking Candidate Resource Plan within each of the three electrification scenarios. NS Power has
26 committed to ultimately choosing a single 25-year Revenue Requirement minimized plan;
27 however, it is not clear to EfficiencyOne on what criteria NS Power intends to make this decision,
28 or how IRP model results will produce information that helps NS Power make this decision.

¹ M05522, November 5, 2014 Board correspondence to NSPI

1 With this issue in mind, EfficiencyOne recommends that:

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- 3 • NS Power select one electrification scenario on the basis of perceived likelihood of
- 4 each scenario occurring. This determination should be made by NS Power and E3, with
- 5 opportunity for comment and input from Stakeholders.
- 6 • NS Power then select a PRP from within the ‘most likely’ electrification scenario.
- 7

8 EfficiencyOne believes the above to represent a fair and transparent means of PRP selection.

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10 ***1.3 Addition of Pathways Electrification to Load Forecasts***

11 EfficiencyOne has the following current understanding of the mechanics associated with
12 modifying the 2019 Load Forecast for the effects of electrification from the Decarbonization study:

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- 14 • NS Power will first remove the 40% of future EE & DR from the ‘before DSM’ scenario
- 15 from the 2019 Load Forecast, while retaining lasting impacts of previously-delivered
- 16 programs.z
- 17 • NS Power will look to the E3 Decarbonization study to ascertain the level of incremental
- 18 electrification associated with both the Moderate and High electrification cases from the
- 19 E3 study. NS Power will then adopt consistent inputs associated with those cases, within
- 20 its 2019 Load Forecast end-use model to produce a modified 2019 Load Forecast that
- 21 accounts for electrification, before EE and DR. No data from the Pathways model will be
- 22 directly used.
- 23

24 If any part of that understanding is incorrect, EfficiencyOne requests that NS Power clarify in
25 response.

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27 **2.0 E3 Pathways Report: General Clarification**

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29 In addition to the above recommendations, EfficiencyOne requests confirmation of its
30 understanding on the following points:

- 1 • The E3 Pathways Study is agnostic toward the level of costs, mechanisms (i.e. policy
2 designs), and delivery entity/ies for electrification scenarios.

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5 **3.0 Treatment of EE and DR in Draft Scenarios and Modelling Plan**

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7 As evidenced by the E3 Decarbonization study – energy efficiency has a large role to play in any
8 potential decarbonization approach, and in addition, the 2020 IRP provides the first opportunity
9 for systematic evaluation of demand response techniques in a Nova Scotia IRP context.

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11 ***3.1 Inconsistent Modelling of DSM Resources***

12 The available potential of each form of DSM explored in this IRP (EE, DR and electrification) is
13 highly dependent on the assumptions for the other forms of DSM. For example, a scenario where
14 all oil furnaces are converted to heat pumps has vastly more potential for heat pump energy
15 efficiency (e.g. higher COP, better cold climate performance) than a scenario without that level of
16 electrification.

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18 EfficiencyOne’s 2019 EE and DR Potential Studies assumed a single electrification forecast; that
19 assumption came from NS Power’s 2019 Load Forecast. Therefore, all four scenarios of EE and
20 DR (Low, Base, Mid, Max Achievable) assume the same level of electrification. This was
21 intentional, as the scenarios were designed to only vary the ratepayer-funded impacts from EE and
22 DR while holding all else equal.

23
24 E3’s Decarbonization study took a markedly different approach, modeling economy-wide
25 emissions and allowing many parameters to vary between scenarios in order to achieve a specific
26 total emissions reduction profile. In order to achieve that profile, high levels of energy efficiency
27 had to be paired with high levels of electrification. However, NS Power’s intent is to extract only
28 the electrification impacts from the study for use in the IRP model as load modifiers. These
29 electrification scenarios, which all require very “significant energy efficiency”² in order to meet

² Nova Scotia Power Inc, Deep Decarbonization in Nova Scotia: Phase 1 Report, February 2020, At Page 17.

1 net zero 2050 targets, will be paired in the IRP model with the EE & DR scenarios from
2 EfficiencyOne’s potential study, which were all based on much lower levels of electrification.
3 EfficiencyOne understands NS Power will also require the IRP model to meet the mandated GHG
4 emission reductions from (or similar to) the Decarbonization study³. The result, for any CRP with
5 more electrification than the 2019 Load Forecast, will be that:

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- 7 a) The levels of EE & DR will be artificially low, as Navigant simply did not model EE &
8 DR scenarios based on such high levels of electrification; and that
 - 9 b) The levels of non-emitting supply side options may become artificially high, as the IRP
10 model will likely fill the gap with low-carbon or zero carbon generation to serve the high
11 electrification loads, under GHG emissions constraints that Pathways chose to serve with
12 EE (presumably on the basis of cost). These foregone DSM activities may well have been
13 cost-effective when measured against non-emitting supply side options.
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15 It would be possible, through a DSM Potential Study, to model different electrification, energy
16 efficiency and demand response together, producing scenarios that properly account for the
17 interactive effects between the three. However, it seems the best path forward for the 2020 IRP,
18 given the current data and desire to explore electrification scenarios, is to allow the four DSM
19 Potential Study scenarios to be paired with the three electrification scenarios, while acknowledging
20 that the resulting CRPs will not contain truly optimal levels of electrification, EE, DR or
21 renewables.

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23 ***3.2 Pairing EE & DR Scenarios with CRPs***

24 It is important to recognize the number of possible solutions has gone from three in the 2014 IRP
25 (Low-Low, Base, High), to 16 in the 2020 IRP, accounting for differing combinations of DR and
26 EE. The existence of three electrification scenarios further constrains the level of possible analysis
27 in each given IRP “scenario”. EfficiencyOne notes that sufficient exploration of EE and DR in this
28 context will be challenging, but is essential given that the 2020 IRP will inform DSM-decision-

³ *Ibid*, Page 3.

1 making on a go-forward basis through the general IRP results, and the development of avoided
 2 costs.

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 4 With the above in mind, and recognizing a full exploration of the EE and DR solution space may
 5 not be possible given the sheer number of possible cases to be explored, EfficiencyOne is
 6 suggesting EE and DR pairings for the proposed scenarios as follows, as well as suggesting three
 7 additional combinations for consideration:

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 9 *Table 1 - Suggested EE and DR Scenarios for Inclusion*

Case Number	Scenario	Driver	EE Scenario	DR Scenario
1A	Comparator	Current Landscape	Base	Base
2A	Net Zero – High Electrification	Current Landscape	High	High
2B	Net Zero – High Electrification	Distributed Resources Promoted	High	High
2C	Net Zero – High Electrification	Regional Integration	Base	Base
3C	Net Zero – Moderate Electrification with Early Coal Closure	Regional Integration	Mid	Base
4A	Net Zero – Moderate Electrification	Current Landscape	Mid	High
4B	Net Zero – Moderate Electrification	Distributed Resources Promoted	Mid	High
4C	Net Zero – Moderate Electrification	Regional Integration	Base	Base
5C	Absolute Zero World	Regional Integration	Mid	Base
5D	Absolute Zero World	No New Emitting Resources	Mid	High
1A-2	Comparator	Current Landscape	Mid	High
2C-2	Net Zero – High Electrification	Regional Integration	Mid	High

4C-2	Net Zero – Moderate Electrification	Regional Integration	Mid	High
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EfficiencyOne developed the above pairings with a focus on generally exploring differing levels of EE and DR, while at the same time suggesting pairings that may be more likely to be aligned with the existing scenario and driver (e.g. high electrification, high EE, and high DR).

Following the emergence of clear high-performing Candidate Resource Plans, EfficiencyOne requests that additional exploration of optimal EE and DR levels be conducted. EfficiencyOne can provide recommendations on priority inclusions for this enhanced analysis, should all 16 EE and DR case combinations not be possible to model.

These two recommendations, should they be adopted, will provide sufficient exploration of EE and DR for stakeholders to assess.

EfficiencyOne recommends:

- The suggested EE and DR pairings represented in Table 1 above form the EE and DR scenarios for the ten cases as proposed as well as the three additional scenarios.
- Enhanced analysis take place for EE and DR combinations contained within high-performing Candidate Resource Plans, with the consultation of EfficiencyOne.

4.0 Avoided Costs of Transmission and Distribution

There is general agreement from NS Power that the T&D avoided costs will be addressed as part of the overall IRP process and NS Power will establish a separate process for this aspect of the IRP. EfficiencyOne understands that NS Power will develop a process, with involvement from stakeholders, to calculate the avoided cost of T&D, and consider the development of an approach and alternate methodology than currently exists for the calculation. This process will occur in parallel with the IRP and will conclude during the course of the IRP. EfficiencyOne appreciates this effort and looks forward to participation in the process.

1 NS Power expects to be able to calculate avoided T&D costs on a narrower set of Candidate
2 Resource Plans later in the IRP process and sharing those with stakeholders. EfficiencyOne also
3 understands that these costs cannot be calculated using the IRP model and will not be an input to
4 the IRP model.

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6 Finally, EfficiencyOne wishes to reiterate the importance of accurate avoided costs of
7 Transmission and Distribution be provided. A number of key work products, analysis and planning
8 decisions depend on the accurate assessment of all avoided costs, including Efficiency Nova
9 Scotia's Rate and Bill Impact Analysis.

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11 All of which is respectfully submitted

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