

**STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION**

DOCKET NO. DG 19-126

Northern Utilities, Inc.

2019-2024 Integrated Resource Plan

Working Group Report

I. INTRODUCTION & PROCEDURAL HISTORY

On May 27, 2020, Northern Utilities, Inc. (“Northern” or the “Company”), as part of a May 27, 2020 settlement agreement (the “Settlement”) with the Commission Staff (now the Staff of the Department of Energy (“DOE”)), and the Office of the Consumer Advocate (“OCA”) agreed to convene a working group (“Working Group”) to discuss potential approaches and recommendations regarding the assessment of environmental, economic, and health-related impacts in least cost integrated planning as required under RSA 378:37-40. The Settlement was ultimately approved by the Commission in Order No. 26,382 (July 23, 2020). The settling parties agreed to provide Working Group recommendations to the Commission proposing guidance regarding expectations under RSA 378:37-40 for future least cost integrated plans (“LCIRPs”). Specifically, the Settlement stated:

The Working Group would ultimately provide a report to the Commission regarding whether and how Northern’s future LCIRPs could further incorporate assessments of environmental, economic and health-related impacts into least cost planning, including consideration of alternative resources. The Settling Parties agree that the proposed development of recommendations by the Working Group would be specifically related to: (1) the statutory interpretation of RSA 378:37-40; (2) recommended criteria for the evaluation by Northern of least cost resources to meet the applicable statutory requirements regarding environmental, economic and health-related impacts in future LCIRPs, including, but not limited to, alternative resources

and optimization of pipeline capacities; and (3) the content and presentation of future LCIRP filings; including recommendations on how to integrate the Working Group's recommendations into the content and presentation of Northern's next LCIRP filing.

May 27, 2020 Settlement in Docket No. DG 19-126 at 3 (emphasis added).

The parties to the Working Group subsequently engaged in numerous productive meetings over the course of approximately eleven months. During those meetings, the parties discussed a wide range of potential approaches to incorporating additional considerations into the Company's LCIRP to ensure consistency with RSA 378:37-40. Through a collaborative process, the parties refined these approaches into a working outline of potential recommendations. Also through that process, the Working Group refined the scope of its efforts on certain areas of focus including statutory interpretation, identification of resource alternatives, inventory of resource impacts, assessment of evaluation criteria modifications, and content and presentation of the Company's next LCIRP.

The parties agreed they would benefit from the input of a third-party expert consultant with respect to certain subject areas. To allow for time to issue a Request for Proposals ("RFP") and work with a consultant, the parties requested that the Commission extend the time to file a Working Group report to December 31, 2021, and further extend the deadline for the Company to file its next LCIRP to December 31, 2022.¹ The Commission granted the parties' request in an Order *Nisi* dated August 20, 2021. *See* Order No. 26,510 (August 20, 2021). The Order *Nisi* also waived the requirement that the LCIRP be filed within two years of the Commission Order approving the prior LCIRP. *Id.* at 4.

Following the issuance of an RFP, third-party consultant DNV-GL Energy Insights USA,

¹ On December 29, 2021, Northern requested an extension of time to file the Working Group report by March 31, 2022 and to extend the deadline for the Company's next LCIRP to March 31, 2023. The Company's request remains pending before the Commission.

Inc. (“DNV”) was engaged to assist in furthering the Working Group’s efforts. DNV participated in multiple meetings with the Working Group with the intent of producing three reports relating to certain areas the Working Group had identified for focus: Resource Alternatives, Resource Impacts, and Evaluation Criteria (including a proposed modified version of the Resource Impact Summary, Table VIII-1 provided in Northern’s 2019 LCIRP). DNV produced the requested materials, including a memorandum summarizing DNV’s recommendations, which provided the Working Group with background information on various resource alternatives, approaches to measure resource impacts, and potential evaluation enhancements among other information. The Working Group leveraged the DNV reports, as well as the Working Group’s own collective experience and assessments regarding feasibility, expected costs, and investment priorities in making the recommendations included in this Working Group Report (the “Report”).

The Report is structured to align with the Settlement. As described in the Settlement, the primary goal of the Working Group is to report to the Commission whether and how Northern’s future LCIRPs could further incorporate “assessments of environmental, economic and health-related impacts”. Accordingly, while the Working Group generally agrees that Northern has addressed those items in its prior LCIRP filings to a limited extent, the Report focuses primarily on enhancements to those three dimensions of impact. Further, the Report is organized to align with the Settlement in presentation and, thus, includes: (1) recommendations related to the statutory interpretation of RSA 378:37-40; (2) recommended criteria for evaluation by Northern of least cost resources regarding environmental, economic and health-related impacts, as well as alternative resources and optimization of interstate pipeline capacities; and (3) the content and presentation of future LCIRP filings.

II. STATUTORY REVIEW

The interpretation and application of RSA 378:37-:40 is an issue of particular significance to gas distribution companies like Northern, given the statutes' focus, both historically and in present form, on matters pertaining to electric utilities. Initially, the Working Group notes the general agreement that LCIRPs should, to the extent practicable, reflect the policy of the State of New Hampshire as expressed in RSA 378:37, which provides:

The general court declares that it shall be the energy policy of this state to meet the energy needs of the citizens and businesses of the state at the lowest reasonable cost while providing for the reliability and diversity of energy sources; to maximize the use of cost effective energy efficiency and other demand side resources; and to protect the safety and health of the citizens, the physical environment of the state, and the future supplies of resources, with consideration of the financial stability of the state's utilities.

RSA 378:37.

In line with this statement of general policy, the specific assessments to be included in an LCIRP include, but are not necessarily limited to, the following, as applicable:

- I. A forecast of future demand for the utility's service area.
- II. An assessment of demand-side energy management programs, including conservation, efficiency, and load management programs.
- III. An assessment of supply options including owned capacity, market procurements, renewable energy, and distributed energy resources.
- IV. An assessment of distribution and transmission requirements, including an assessment of the benefits and costs of "smart grid" technologies, and the institution or extension of electric utility programs designed to ensure a more reliable and resilient grid to prevent or minimize power outages, including but not limited to, infrastructure automation and technologies.
- V. An assessment of plan integration and impact on state compliance with the Clean Air Act of 1990, as amended, and other environmental laws that may impact a utility's assets or customers.
- VI. An assessment of the plan's long- and short-term environmental, economic, and energy price and supply impact on the state.
- VII. An assessment of plan integration and consistency with the state energy strategy under RSA 12-P.

RSA 378:38.

The Working Group appreciates the Commission’s need for information required to evaluate and render decisions regarding the LCIRP. With respect to the Commission’s evaluation of LCIRP filings, RSA 378:39 provides:

The commission shall review integrated least-cost resource plans in order to evaluate the consistency of each utility's plan with this subdivision, in an adjudicative proceeding. In deciding whether or not to approve the utility's plan, the commission shall consider potential environmental, economic, and health-related impacts of each proposed option. The commission is encouraged to consult with appropriate state and federal agencies, alternative and renewable fuel industries, and other organizations in evaluating such impacts. . . . Where the commission determines the options have equivalent financial costs, equivalent reliability, and equivalent environmental, economic, and health-related impacts, the following order of energy policy priorities shall guide the commission's evaluation:

- I. Energy efficiency and other demand-side management resources;
- II. Renewable energy sources;
- III. All other energy sources.

RSA 378:39 (emphasis added).

Some of the required assessments set forth in RSA 378:38 are plainly inapplicable to natural gas utilities, e.g., “an assessment of the benefits and costs of ‘smart grid’ technologies, and the institution or extension of electric utility programs designed to ensure a more reliable and resilient grid to prevent or minimize power outages.” RSA 378:38, IV. However, the Working Group believes that the Company is either addressing the requirements of RSA 378:38, as applicable, in its current planning processes, or can take recommended incremental steps to enhance its planning processes in a manner consistent with the statute. Regarding each of the applicable factors identified in RSA 378:38, the Working Group offers the following interpretations and recommendations.

A. Forecast of Future Demand

Northern’s LCIRPs have always included, as a foundational component, a forecast of future demand for the Company’s service area. The Company’s current methods for

forecasting future demand for gas in its service territory, and for presenting its assessment of that demand within its LCIRP submissions, meet the requirements of RSA 378:38, I. The Company's forecasting process includes reducing projected demand by the amount of incremental energy savings expected from implemented energy efficiency ("EE") programs, namely from the programs Northern administers as part of NHSaves using funds collected from customers via the Local Distribution Adjustment Clause (LDAC) charge. The Working Group supports this approach to considering the impacts of customer-funded EE on Northern's demand forecasts. Given the focus of the Working Group on assessments of environmental, economic and health-related impacts, the Working Group makes no further recommendations with respect to this requirement of RSA 378:38. Northern's forecast of future demand in its LCIRP will be subject to review by the Commission, the OCA, the DOE, and any other interested parties in the Company's next LCIRP proceeding.

B. Assessment of Demand-side Energy Management Programs

As set forth in RSA 378:37, the State's energy policy requires utilities to maximize demand-side resources. Further, where otherwise equivalent, RSA 378:39 prioritizes demand-side resources above supply resources. While RSA 378:38 requires that a utility provide an assessment of demand-side energy management programs, including conservation, efficiency, and load management programs, it does not specify the source or scope of programs to be assessed.

The Company participates fully in the EE proceedings and programs and, as mentioned above, accounts for expected demand reductions from those programs in its supply planning process. The Company's previous LCIRP reviewed approved EE programs and documented the expected demand reductions. 2019 LCIRP at VI-94-101. The Working Group interprets the State's energy policy to require utilities to maximize demand-side resources and therefore

recommends that Northern evaluate demand-side resources beyond the NHSaves EE programs currently approved as potential resource additions in future LCIRP submissions.

C. Assessment of Supply Options

Under RSA 378:38, the Company's LCIRP must include an assessment of supply options "including owned capacity, market procurements, renewable energy, and distributed energy resources." RSA 378:39 prioritizes renewable energy sources over traditional energy sources. For purposes of the Company's next LCIRP, the Working Group recommends that the Company seek to expand potential supply options by identifying renewable supply resources, such as Renewable Natural Gas ("RNG"). The Working Group also supports exploring Certified Gas ("CG"), which is natural gas that has been certified to have been produced with low emissions. The Working Group takes no position on the question of whether supply options assessed by a natural gas utility for LCIRP purposes should include options that do not in some way involve the use of natural gas or other commodities delivered via Northern's distribution pipeline network.

D. Assessment of Distribution and Transmission Requirements

RSA 378:38, IV requires a review of "distribution and transmission requirements," including an assessment of the benefits and costs of certain technologies and programs that are, on their face, inapplicable to Northern. The Commission has previously held that this section applies only to electric distribution utilities. *See Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities*, Order No. 26,225 at 7 n. 2 (March 13, 2019). As such, this element of RSA 378:38 was not a focus of the efforts or analysis of the Working Group. Regardless, the Working Group believes that assessments of Non-Pipeline Alternatives ("NPAs") that could, potentially, delay future distribution system reinforcement costs, or increase the flexibility of other potential resource options, would, if available or applicable, be appropriate to consider in

assessing this criterion. The Working Group recommends that in its assessment of this element, the Company include in its next LCIRP a description of any NPAs it has evaluated or planned.

E. Assessment of Integration and Impact on Compliance with the Clean Air Act and Other Environmental Laws and Regulations

RSA 378:38, V states that an LCIRP is to include a review of “plan integration and impact on state compliance with the Clean Air Act of 1990, as amended, and other environmental laws that may impact a utility's assets or customers.” The Working Group recommends that the Company seek input from the New Hampshire Department of Environmental Services (“DES”) regarding the effect, if any, of Northern’s resource planning activities on environmental requirements, such as New Hampshire’s Clean Air Act attainment goals and priorities. The Company should document this input as part of its next LCIRP.

F. Assessment of Long- and Short-term Environmental, Economic, and Energy Price and Supply Impact

RSA 378:39 requires the Commission to consider potential environmental and economic impacts (along with public health impacts) of proposed supply options. Consistent with the Working Group’s charge pursuant to the settlement, later in this Report the Working Group outlines its recommendations as to how Northern can better incorporate assessments of environmental and economic impacts into its least cost planning. Northern’s implementation of the proposed recommendations will further build assessment of these factors into Northern’s planning process.

More directly to the review of this criterion, Northern is a relatively small participant in the natural gas market, and adjustments in its resource supply procurement or deployment are unlikely to have a material impact on overall energy price or supply in the region, or the state. Northern’s LCIRP process defines its supply position by comparing its planning load forecast to its current portfolio over a five year planning horizon. *See* 2019 LCIRP, Sec. VII, Resource

Balance. The LCIRP then reviews incremental resource options (Sec. VIII) available to satisfy supply needs and defines its approach to establishing a Preferred Portfolio (Sec. IX). Northern then assesses its supply impact by evaluating incremental resource options and defining its preferred portfolio. Accordingly, the Working Group believes Northern will satisfy this criterion by continuing its present analyses and implementing the additional steps described throughout this Report.

G. Assessment of Plan Integration and Consistency with the State Energy Strategy

An assessment of LCIRP integration and consistency with the State Energy Strategy is necessarily the product of two inputs that are subject to change on a regular basis. Just as the Company's LCIRP is periodically updated to reflect current conditions, under RSA 12-P:7-a the development of the State Energy Strategy is undertaken by the DOE on a regular and recurring basis and may change depending upon the status of different technologies and policy preferences, among other considerations, over time. Accordingly, Northern may be able to assess the consistency of its LCIRP with the Strategy in place at the time that it develops its LCIRP, but that assessment may or may not hold over time. The Working Group does not make any specific recommendation with respect to the interpretation of this criterion or the manner in which the Company complies with it, but recommends that the Company include a discrete section in its next LCIRP assessing the Plan's integration and consistency with the State Energy Strategy under RSA 12-P.

III. RECOMMENDED EVALUATION CRITERIA

As described above, as part of the scope of review defined in the Settlement, the Working Group is to recommend criteria by which Northern will evaluate least cost resources to meet applicable statutory requirements regarding environmental, economic and health-related

impacts of proposed resource options, including, but not limited to, alternative resources, and the optimization of pipeline capacities. The criteria considered by the Working Group were based, in part, upon the extent to which resources and/or technologies were deemed feasible for implementation or inclusion by Northern and the reasonableness of potential costs for including those potential supply alternatives. The Working Group recognizes that planning activities may encounter some degree of limitations, including technical, financial, temporal, or otherwise. As such, the Working Group makes the following recommendations for Northern to incorporate into its planning process, and its future LCIRP filings, as its capabilities permit.

In its prior LCIRP, Northern made an effort to incorporate the various criteria specified in RSA 378:38. For example, Northern sought to identify non-pipeline and renewable resources, including liquefied natural gas (“LNG”) and RNG, as alternatives to traditional pipeline supplies. *See* 2019 LCIRP, Sec. VIII.C. Northern also added sections to address environmental, economic and public health impacts. *See* 2019 LCIRP, Sec. VIII.D. However, the parties to Docket No. DG 19-126 agreed that there is an opportunity for the Company to provide more detailed analyses in its next LCIRP.

In developing its recommendations regarding evaluation criteria to the Commission, the Working Group considered three fundamental steps in the development of a least cost energy resource plan: (1) the identification of resource alternatives; (2) an assessment of the impacts of such resources; and (3) the application of evaluation criteria to inform resource decision making. This Section is structured after these steps.

A. Resource Alternatives (in addition to traditional resource options)

Northern has historically focused its resource planning efforts on traditional natural gas supplies, such as flowing gas accessible via pipeline transportation capacity from production areas or supply hubs to its system, underground natural gas storage, and natural gas peaking

supplies (collectively, “traditional supplies”). Consistent with the State’s Energy Policy as stated in RSA 378:37, Northern’s approach has been effective in assessing the direct cost of resources under its planning process (under “quantitative analyses”, including both “landed cost” and “modeled cost”), thus “ensuring lowest reasonable cost.” Northern has also been effective at assessing non-price aspects of resource options (under “qualitative analyses”), thus “providing for the reliability and diversity of energy sources.” Beyond such analyses, however, the Energy Policy as expressed in RSA 378:37 also anticipates the maximum “use of cost effective energy efficiency and other demand side resources,” and the Commission’s evaluation as required under RSA 378:39 includes a preference first for energy efficiency and then for renewable energy sources over other energy sources (such as traditional supplies), given equivalent cost, reliability, environmental, economic, and health-related impacts. Therefore, to satisfy the LCIRP statute, and to assist the Commission in its review of the Company’s LCIRP, the Working Group recommends that Northern should evaluate a more thorough set of alternative resources, including demand side and renewable resources, in addition to traditional supplies to assess whether they might be equivalent (or superior) from cost, reliability, environmental, economic, and health perspectives.

With respect to demand-side resources, the Working Group recommends that Northern further analyze and assess incremental EE as a first order option, including any new technologies to improve deployment of EE and available means to increase the development of existing EE technology and programs. While there is currently no approved mechanism to recover EE expense outside of the energy efficiency docket, the Working Group interprets the LCIRP statute to direct utilities to maximize cost-effective EE, and encourages the Commission to consider proposals that would allow for such investment if the appropriate findings can be

made. The Working Group notes that because Northern provides supply to one set of customers (Sales Service customers), plans capacity for another (Sales and Capacity-Assigned customers), and distributes gas to all customers, it will be important to carefully consider the design of potential incremental EE offerings, so that costs and benefits are aligned in a just and reasonable manner. If Northern identifies cost-effective incremental EE in the context of least cost planning, it will pursue options to increase EE deployment and report on that deployment as part of the LCIRP. The Working Group also explored gas demand response as a potential resource, specifically mass market load control programs and Commercial and Industrial (C&I) fuel switching. Mass market load control programs, which involve paying customers an incentive in return for the ability to control the customer's thermostats, have experienced poor results in pilot programs where gas companies have often been unable to discern measurable savings despite incurring significant cost. C&I fuel switching is understood to be largely occurring today by customers and their retail suppliers as they respond to market price signals.

In terms of renewable supply side resource options, as discussed earlier, the Working Group recommends that Northern further investigate and assess RNG and CG as potential offsets to existing traditional gas supplies. RNG includes biogas from anaerobic digestion, which may be associated with landfills, wastewater treatment plants, or standalone digesters to process animal manure or food waste, where such biogas (which typically includes about 60-70 percent methane) is cleaned to pipeline quality standards (which typically includes 90-95 percent methane). RNG may also be produced via thermal gasification of organic matter or by adding carbon to hydrogen, a process referred to as methanation, to create synthetic natural gas (SNG). While other potential renewable supply options may emerge, such as green hydrogen, which is hydrogen created from excess renewable power, based upon the review of the

Working Group, those supply alternatives are not yet sufficiently developed or at a mature level where it would be reasonable or cost-effective for Northern to integrate them into its supply portfolio. The Working Group did review hydrogen as a direct fuel for blending with natural gas, but in addition to being an underdeveloped and costly market, the potential impacts of hydrogen on the Company's distribution system and customers' equipment are not yet well understood.

The Working Group also recommends Northern explore CG, which is natural gas supply independently audited and certified to have been produced with much lower methane emissions than typical natural gas. CG is becoming increasingly available as more auditing firms become established, and more suppliers are audited and invest in equipment to reduce their emissions, thereby increasing the availability of CG.

- Recommendation 1: Working Group recommends that Northern evaluate incremental Energy Efficiency, as a potential resource alternative and look for opportunities for C&I customer fuel switching.
- Recommendation 2: Working Group recommends that Northern evaluate RNG as an alternative to traditional fossil fuel based supply and that Northern explore CG.

B. Impacts of Traditional and Alternative Resources

To compare resource alternatives in a manner consistent with the statute, Northern must assess not only the cost, reliability and diversity of resources, which the Working Group agrees Northern has historically done well, but must also assess environmental, public health and economic impacts. These additional impact analyses apply to both existing resources and potential new resources, including both traditional supply options and the resource alternatives discussed in this Report. In its 2019 LCIRP, Northern addressed environmental, public health and economic development effects to a limited extent as part of its resource impact summary.

The Working Group agrees there is room for improvement regarding Northern's evaluation by seeking to directly assess impacts in these areas where possible, and by estimating monetary effects of resources in each of these areas where feasible.

In terms of environmental impacts, the Working Group recommends that Northern estimate the direct greenhouse gas ("GHG") emissions of portfolio resources and incremental resource options. Northern should estimate both fugitive emissions, which occur due to unintentional pipe leakage, and combustion emissions for all resource options. The GHG emissions profile of a resource is generally determined by using emissions factors to convert activity data into associated quantities of emissions. Emissions factors are typically expressed in terms of emissions per unit of activity. For example, the emissions factor associated with fuel combustion depends on the compounds in the fuel. Northern may estimate the emissions of individual greenhouse gases, including methane (CH₄), carbon dioxide (CO₂) and nitrogen (N), but the Working Group recommends that Northern convert to carbon dioxide equivalent (CO₂e) in metric tons (MMT) per MMBtu or similar per unit measurement for comparison of resources. Direct GHG emissions relate to emissions that occur after a supply is received onto Northern's distribution system. Northern may also estimate indirect, or upstream, emissions, such as those along interstate pipelines supplying Northern's system. In addition to the volumetric estimation of GHG emissions, Northern should convert the emissions to a monetary impact and fully explain its assumptions and sources. In this analysis, EE would be presumed to avoid the system average GHG emissions of Northern's portfolio. The emissions associated with an RNG supply will vary depending on the emissions avoided by utilizing the feedstock for the RNG as well as the emissions created during the production process.

Public health impacts of gas resources relates to pollutants that impact local air quality,

including nitrous oxides (NO_x), sulfur oxides (SO_x), and particulate matter (PM_{2.5}) emissions. The amount of these pollutants from gas resources should be estimated and used to assess potential health impacts. Potential health impacts include hospital admissions, acute bronchitis, respiratory symptoms and asthma exacerbation, as well as potentially more serious illness. The Working Group recommends that the Company evaluate a methodology for quantifying air quality pollutants, the associated public health impacts of those pollutants, and estimating the associated monetary cost of existing resources in its portfolio as well as incremental resource options being evaluated in terms of public health impact.

In terms of economic development impacts, the Working Group recommends that the Company evaluate the employment impacts of resource options in New Hampshire, with a specific focus on the Company's service territory. Specifically, Northern should estimate the direct, indirect and induced jobs that are created by a new or existing resource, including consideration of any lost jobs as applicable. The Working Group understands that employment impacts can be approximated by applying payroll data for direct jobs to established economic multipliers for the relevant industries to convert the direct effects into indirect and induced effects. Northern should look for ways to quantify in monetary terms the economic impact of jobs added or lost to the State.

- Recommendation 3: Working Group recommends that Northern assess resources in terms of environmental impacts by documenting the GHG impacts of evaluated resources in terms of emissions (MMT CO₂e) created or avoided and an estimate of associated monetary impact.
- Recommendation 4: Working Group recommends that Northern assess public health impacts in terms of the health effects of local air quality (AQ) impacts of evaluated resources by documenting SO_x, NO_x and PM_{2.5}, projecting health impacts and estimating the monetary impact.

- Recommendation 5: Working Group recommends that Northern assess economic development impacts by estimating direct, indirect and induced jobs created from a resource and the associated economic development impact.

C. Criteria for Evaluating Resources

For the purposes of conducting the assessment for an LCIRP, evaluation represents the process of bringing together the information gathered as part of resource identification and documenting resource impacts to make decisions about which mix of resources best meet the energy needs of the citizens and businesses of the State. Evaluation involves comparing different resource options based on the criteria set forth in the statute and discussed herein, including cost, reliability, environmental, public health and economic impacts, as well as the Company's judgment. Under its current resource planning process, Northern uses both qualitative tools and quantitative tools. *See Northern's 2019 LCIRP, Section IX, Preferred Portfolio.* With respect to the quantitative measures, Northern reviews its portfolio of existing and potential resource options for the purpose of optimizing its portfolio to achieve the lowest cost. This analysis focuses on evaluated cost, term and expected dispatch and utilization of existing and potential resources. Northern also reviews non-price qualitative factors, including availability, price volatility, diversity, integration with the overall portfolio and reliability, to assess incremental resources in terms of overall "viability and fit" of potential resource options.

The Working Group recommends that Northern incorporate the resource impact analyses described earlier with respect to environmental, public health and economic impacts into its planning process. This may be done by qualitatively assessing the impacts, both volumetric and monetary, or by separately adding the sum of the estimates of monetized costs for these factors to the direct financial costs that customers would pay. The Working Group believes doing so would offer a more complete view for the Commission's consideration.

Lastly, in looking at incremental resources, whether demand-side or supply based, the Working Group encourages Northern to explore whether NPA opportunities exist. Such NPA opportunities might involve the strategic location of a new interconnection into the Company's system, such as a delivery point(s) for the receipt of RNG that delay future distribution system costs, particularly if the RNG will be received in the form of compressed natural gas. NPAs may also exist in the form of additional EE. For example, the Company may have opportunities to more heavily market its EE programs in areas where pending gas distribution system improvements are needed to delay or postpone those system reinforcement investments.

- Recommendation 6: Working Group recommends that Northern expand its evaluation methods to include review of environmental, public health and economic development impacts of resource alternatives. Northern may separately present customer financial costs and evaluated societal costs due to environmental, public health and economic impacts.
- Recommendation 7: When assessing resource alternatives, Northern should look for opportunities to incorporate Non-Pipeline Alternatives that could avoid or defer reinforcements costs associated with distribution system infrastructure and seek to incorporate such opportunities as resource options are developed

IV. CONTENT and PRESENTATION of FUTURE LCIRP FILINGS

Among the items to be considered by the Working Group in this Report are recommendations regarding the content and presentation of Northern's future LCIRP filings. The Working Group recognizes that other recommendations provided herein will introduce certain new analyses that will require additional explanation and presentation in the next LCIRP, and over time. As for the presentation and documentation of those adjustments, as well as the other matters traditionally included within an LCIRP submission, the Working Group recommends that Northern structure the plan document in a logical manner to clearly guide the reader. New materials should be noted and all findings should be documented. Lastly, while

making no specific recommendations, the Working Group suggests that Northern revisit the layout of its “Resource Impact Summary” table, Table XIII-1 in the 2019 LCIRP. While the Working Group agrees the 2019 version of the table provided significant information regarding “Resource Impacts” of Northern’s existing portfolio and potential future resource options relative to the impact categories described in that filing, the recommendations provided herein may provide opportunities for improvement.

- Recommendation 8: Working Group recommends that Northern incorporate new material relating to the recommendations contained in this Report into its LCIRP document in a logical manner, and that Northern revisit the structure of its Resource Impact Summary table and look for opportunities to better label narrative sections to more clearly guide the reader.

V. **WORKING GROUP RECOMMENDATIONS**

The Working Group views appropriate least cost energy planning as a continuous effort to improve upon resource identification, assessment of impacts, and determination of cost effectiveness, while ensuring reliability, recognizing environmental, public health and economic impacts, and supporting the availability of future supplies, as well as the financial stability of the utility. Northern has historically worked to improve upon its resource planning process and with the recommendations presented here, Northern will continue to do so. The Working Group balanced considerations of feasibility, cost, and the recognition that Northern will require time to research and accrue experience as it attempts to broaden the set of analytical tools it uses for resource planning and their scope of application, and that enhancements to the Company’s planning processes will likely evolve over the course of multiple LCIRPs.

To Summarize, the Working Group’s recommendations are:

- Recommendation 1: Evaluate incremental Energy Efficiency as a potential resource alternative and look for opportunities for C&I customer fuel switching.

- Recommendation 2: Evaluate RNG as an alternative to traditional fossil fuel based supply and that Northern explore CG.
- Recommendation 3: Assess resources in terms of environmental impacts by documenting the GHG impacts of evaluated resources in terms of emissions (MMT CO₂e) created or avoided and an estimate of associated monetary impact.
- Recommendation 4: Assess public health impacts in terms of the health effects of local air quality (AQ) impacts of evaluated resources by documenting SO_x, NO_x and PM_{2.5}, projecting health impacts and estimating the monetary impact.
- Recommendation 5: Assess economic development impacts by estimating direct, indirect and induced jobs created from a resource and the associated economic development impact.
- Recommendation 6: Expand Northern's evaluation methods to include review of environmental, public health and economic development impacts of resource alternatives. Northern may separately present customer financial costs and evaluated societal costs due to environmental, public health and economic impacts.
- Recommendation 7: When assessing resource alternatives, identify opportunities to incorporate Non-Pipeline Alternatives that could avoid or defer reinforcements costs associated with distribution system infrastructure and seek to incorporate such opportunities as resource options are developed
- Recommendation 8: Incorporate new material relating to the recommendations contained in this Report into Northern's LCIRP document in a logical manner, revisit the structure of Northern's Resource Impact Summary table, and look for opportunities to better label narrative sections to more clearly guide the reader.