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February 5, 2020

Pacific Northern Gas Inc.
750 – 888 Dunsmuir Street
Vancouver, BC V6C 3K4
By email: votto@png.ca

Attn: Verlon G. Otto, Director, Regulatory Affairs

Dear Sir:

Re: BC Utilities Commission
Pacific Northern Gas Inc. Application for Acceptance of 2019 Consolidated Resource Plan and for Acceptance of Energy Conservation and Innovation Portfolio Funding for 2020 and 2022
B.C. Sustainable Energy Association Information Request No. 1

Attached please find the intervener BCSEA's Information Request No. 1 to PNG. A version in Word format will be provided separately. If you have any questions, please do not hesitate to contact me.

Yours truly,

William J. Andrews

Barrister & Solicitor

Encl.

REQUESTOR NAME: **BC Sustainable Energy Association**
INFORMATION REQUEST ROUND NO: **1**
TO: **Pacific Northern Gas Ltd. and Pacific Northern Gas (N.E.) Ltd.**
DATE: **February 6, 2020**
PROJECT NO: **None**
APPLICATION NAME: **Application for Acceptance of 2019 Consolidated Resource Plan and for Acceptance of Energy Conservation and Innovation (ECI) Portfolio Funding for 2020 and 2022**

1. Introduction

1.0 Topic: CleanBC Plan
Reference: Application, Exhibit B-1, p.16

"The CleanBC Plan, released in December 2018, sets out a broad suite of policies aimed at reducing annual greenhouse gas (GHG) emissions in the province by 18.9 mega-tonnes (Mtpa) by 2030. Specific policies reflected in the demand forecasts and strategies set out in PNG's Consolidated Resource Plan are:

a) Increasing the energy efficiency of new and existing buildings;
b) Requirements for 15 percent of natural gas consumption to be from renewable gas;
c) Incentives to industry for reducing their GHG emissions; and
d) Targets for zero emission vehicles."

1.1 Please identify the elements of the 2019 Consolidated Resource Plan that correspond to each of the four CleanBC Plan policies.

2.0 Topic: Resource Planning Objectives
Reference: Application, Exhibit B-1, section 1.4; Appendix A, Resource Planning Objectives; Section 9 Portfolio Evaluation and Planning

Compared to the PNG(NE) 2015 Resource Plan, in the 2019 Consolidated Resource Plan PNG has increased the weighting on "Alignment with BC Energy Objectives from 10% to 15% and has decreased the weighting on "Least Cost Service" from 30% to 25%. [pp.10-11]

In Section 9 Portfolio Evaluation and Planning, PNG states:

> "Leaving aside the prospect of significant additional demand on the PNG-West system as a result of the RECAP, no new supply or capacity resources are required to meet identifiable customer demand at this time or within the near future. The development of resource portfolios was therefore not considered necessary and PNG concludes that there is no requirement to complete a resource portfolio evaluation for this Consolidated Resource Plan." [p.134]

2.1 What is the practical effect of PNG's amendment of the weighting of the Resource Planning Objectives?

3.0 Topic: FortisBC's 30BY30 Target for a lower carbon future
Reference: FortisBC website: https://www.fortisbc.com/news-events/media-centre-details/2019/09/23/fortisbc-sets-30by30-target-for-a-lower-carbon-future. [downloaded January 7, 2020

FortisBC states in a media release of September 23, 2019:

"FortisBC sets 30BY30 Target for a lower-carbon future

Sep 23, 2019

Share

Company aims to cut 30 per cent of overall customer emissions by 2030

Vancouver, B.C. – September 23, 2019: FortisBC has established its first ever emissions reduction goal, representing one of the most ambitious emissions reduction targets in the Canadian utility sector. In announcing its 30BY30 Target, FortisBC will work to reduce GHG emissions associated with their customers' energy use by 30 per cent overall by the year 2030. [underline added]

"As the foremost energy provider to British Columbians, we have the opportunity to advance a cleaner energy future for the province and do our part in the global campaign against climate change," said Roger Dall'Antonia, President and CEO of FortisBC, "Our aim with 30BY30 is to accelerate emissions reductions across our customer base and lead the way to a lower-carbon economy."

Last year, FortisBC released its plan to reduce emissions, the Clean Growth Pathway to 2050, as part of the consultation surrounding the Province's CleanBC strategy. The Clean Growth Pathway outlined four key areas to make substantial reductions in GHG emissions across the province by:

- tripling investment in energy efficiency in homes, businesses and industry and developing innovative energy projects in B.C.'s communities,
- investing in low and zero-carbon vehicles and transportation infrastructure,
- increasing Renewable Gas inventory by increasing Renewable Natural Gas (RNG) supply and advancing hydrogen deployment,
- positioning B.C. as a vital domestic and international Liquefied Natural Gas (LNG) provider to lower global GHG emissions.

Throughout 2019, FortisBC has undertaken action supporting these key areas including the opening of twelve new EV charging stations, supporting the use of RNG in buses, supplying LNG for Canada's first international LNG export and committing to spending $368 million between 2019 and 2022 on energy-efficiency programs and rebates.

"We set our way forward through our Clean Growth Pathway. 30BY30 will focus our organization on that path and drive us to find innovative new solutions that advance a sustainable future in an affordable way," said Dall'Antonia.

For more information on FortisBC's 30BY30 Target, visit fortisbc.com/30BY30."

3.1 Is PNG aware of FortisBC's 30BY30 Target?

3.2 Has PNG considered adopting a target to reduce GHG emissions associated with its customers' energy use?

3.2.1 Would PNG be willing to consider establishing such a target? Please discuss.

4.0 Topic: Customer Rates and Use Per Customer
Reference: Application, Exhibit B-1

PNG provides rates information on its website. An example for Vanderhoof to Prince Rupert / Kitimat /Terrace residential is at: https://www.png.ca/residential/rates/vanderhoof-to-prince-rupert-kitimat-terrace.

4.1 Please provide a table or tables setting out PNG's January 1, 2020 rates by service areas and by rate class.

4.2 Please provide a summary graphic and table illustrating the differences in rates between the various service areas, by rate class.

4.3 For each of the rate classes, please provide a summary graphic and table illustrating Use per Account and rates for each of the service areas.

4.4 Can it be observed that use per customer is inversely related to rates, between service areas?

4.5 In PNG's view, what are the implications of the relationship between Use Per Account and rates in terms of PNG's resource and DSM planning?

2. Energy Market Outlook

5.0 Topic: Policy Environment and Outlook
Reference: Application, Exhibit B-1, Section 2.1, Policy Environment and Outlook, p.23, pdf p.41

PNG outlines a substantial body of energy conservation and GHG reduction policies and initiatives forming context for the 2019 Consolidated Resource Plan, including:

- federal policies and initiatives such as the Pan-Canadian Framework on Clean Growth and Climate Change to implement Canada's commitments under the Paris Climate Agreement, the development of the federal Clean Fuel Standard, appliances and equipment standards, and the National Model Building Code,

- BC provincial energy use policies and initiatives including the CleanBC Plan addressing homes and buildings, remote communities, industry, transportation, and renewable natural gas, the CleanBC Program for Industry, and the BC Hydrogen Roadmap,

- BC provincial legislation and regulations including the Carbon Tax Act, the Greenhouse Gas Reduction (Emissions Standards) Statutes Amendments Act, the Demand Side Measures Regulation, the Clean Energy Act and Greenhouse Gas Reduction Regulation, the amended Drilling and Production Regulation, the BC Building Code, and the BC Energy Step Code, and

- Municipal energy conservation and GHG reduction policies under the BC Climate Action Charter, adopted by Prince Rupert, Terrace, Smithers, the Peace River Regional District, Fort St. John, Taylor, Dawson Creek, Pouce Coupe and Tumbler Ridge.

5.1 What is PNG's view of the implications of the energy use and climate action policy context for the 2019 Consolidated Resource Plan and ECI Plan?

6.0 Topic: Efficiency of Natural Gas
Reference: Application, Exhibit B-1, p.15, pdf. p.33

With reference to the BC energy objective "2(l) to foster the development of first nation and rural communities through the use and development of clean or renewable resources," PNG states:

> "Natural gas is the most efficient source of energy for thermal requirements..."

6.1 Please explain specifically what is meant by this statement.

6.2 Provide all sources that support PNG's position.

6.3 Please confirm, or otherwise explain, that conventional natural gas is not a "clean or renewable resource."

7.0 Topic: Regional Economic Outlook
Reference: Application, Exhibit B-1, Section 2.2, Regional Economic Outlook, p.32, pdf p.50

7.1 In PNG's view, what are the main points of the Regional Economic Outlook that affect the Consolidated Resource Plan?

8.0 Topic: Supply Outlook
Reference: Application, Exhibit B-1, Section 2.3, Supply Outlook, p.54, pdf p.72

8.1 Please indicate the markets (market hubs) from which PNG obtains natural gas supply for each of its service areas.

8.2 In PNG's view, what are the main points of the Supply Outlook that affect PNG's acquisition of natural gas during the CRP planning period?

9.0 Topic: PNG Burner Tip vs. Electricity Costs
Reference: Application, Exhibit B-1, Section 2.4, p.56-59, pdf p.74-77

"Environmental policies and regulations, and customer perceptions all play a role in the continued acceptance of natural gas as source of energy for PNG's customers. However, short of regulations prohibiting the continued use of natural gas as a source of thermal energy for PNG's customers, or very significant increases to the price of carbon that eliminate the cost advantage natural gas holds over electricity, PNG expects that natural gas service will continue to be the most affordable energy source in all of PNG's service areas over the foreseeable future (Figure 9)." [underline added]

In Figures 9 and 10, PNG provides a comparison of forecasts of its residential burner tip natural gas rates with adjusted BC Hydro residential electricity rates on a $/GJ basis.

9.1 Please confirm, or otherwise explain, that the comparison of PNG's residential natural gas rates and BC Hydro's residential electricity rates in Figures 9 and 10 does not take into account the capital cost of space and water heating equipment.

9.2 Please explain the notes to Tables 9 and 10 saying "Relative efficiency of electricity is assumed to be 90%." I.e., efficiency of electricity relative to what?

9.2.1 What is the basis for the 90% figure for "relative efficiency of electricity"?

9.3 Please confirm, or otherwise explain, that Figures 9 and 10 assume electric resistance heating, not heat pumps.

9.4 Please provide the analysis, in executable electronic format with all formulas intact, that supports each of the graphs in Figure 9 and Figure 10.

9.5 Please provide all assumptions that inform the analysis and provide the basis of each assumption.

9.6 Please clarify: Is the Reference Gas Price Forecast used in Figure 9 and Figure 10 the same as what PNG refers to when it states on page 59 "For this comparative cost analysis, PNG has used an average of the 'NEB Reference', 'NEB High' and industry forecasts, with a small discount to reflect purchases of gas at Stn 2"?

9.6.1 Is the dashed purple line on Figure 11, labeled "Average," the Reference Gas Price Forecast used in the CRP? If not, please provide a graph and table showing the Reference Gas Price Forecast.

9.7 Is there a figure in the Application that shows PNG's "High Carbon Price + 5% RNG @ $30/GJ" gas price scenario? If not, please provide a graph and table that show it.

9.8 Please explain how the "High Carbon Price + 5% RNG @ $30/GJ" gas price scenario relates to the Competitive Electricity Scenario.

3. Customer Attitudes

10.0 Topic: Customer Attitudes
Reference: Application, Exhibit B-1, Appendix IV, PNG Customer Surveys, Final Report, April 22, 2019, pdf p.400

"Regionally, residential and commercial customers in PNGW/TR are significantly less likely than their FSJ/DC counterparts to think natural gas is reasonably priced; to agree that natural gas is a clean and efficient source of energy, or to agree that it is cheaper to heat their home with natural gas than electricity. These findings are consistent with regional differences in PNG's residential natural gas pricing." [pdf p.400]

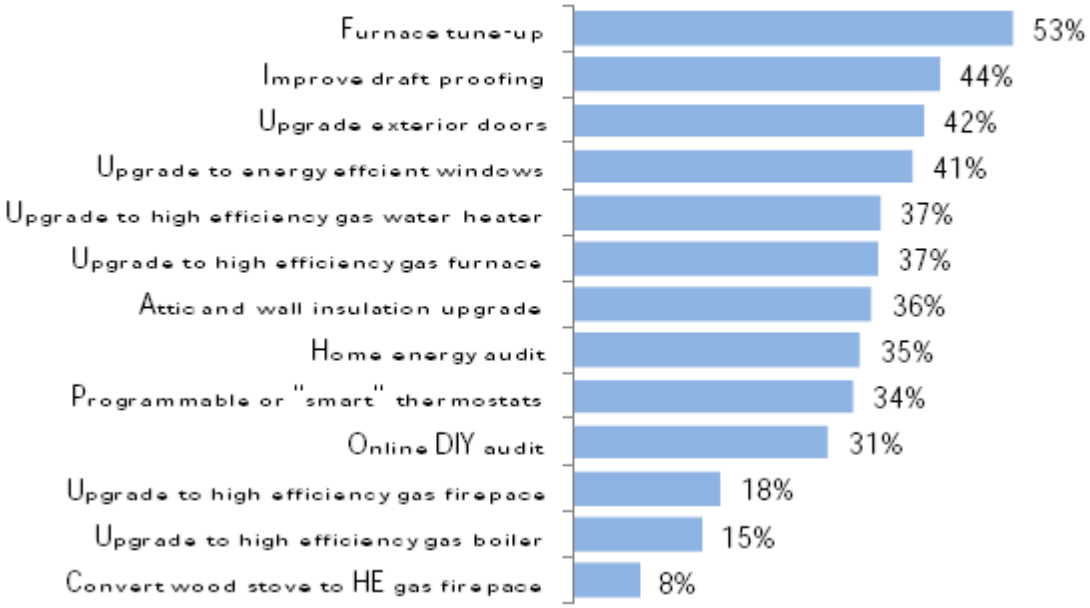
10.1 Does PNG consider that this finding supports enhanced DSM effort in the PNG-W and Tumbler Ridge service areas?

"Significant proportions of residential and commercial customers feel they have reduced their energy use as much as reasonably possible (55% residential, 69% commercial)." [pdf p.400]

10.2 Does PNG have any validation of the accuracy of this opinion expressed by survey respondents?

"[Residential Survey Results] The results, summarized in Figure 4, show respondents are most interested (indicated they were either *extremely* or *very* interested) in a furnace tune-up program (53% very or extremely interested), a program to improve draft proofing (44%) and programs to upgrade either exterior doors (42%) or windows (41%). Respondents showed the least interest in upgrading to a gas fireplace to a high-efficiency model (18%), upgrading a gas boiler (15%), and converting a wood stove to a high-efficiency gas fireplace (8%). The low interest for gas boilers is driven, in large part, to their low penetration (used by 7% of residential respondents as either their main or secondary space heating method. Source: Table 16, Table 18)." [footnote removed]

Figure 4: Interest in Programs and Services – Residential Survey
Percent of Survey Respondents – Very or Extremely Interested



[pdf p.423, italics in the original]

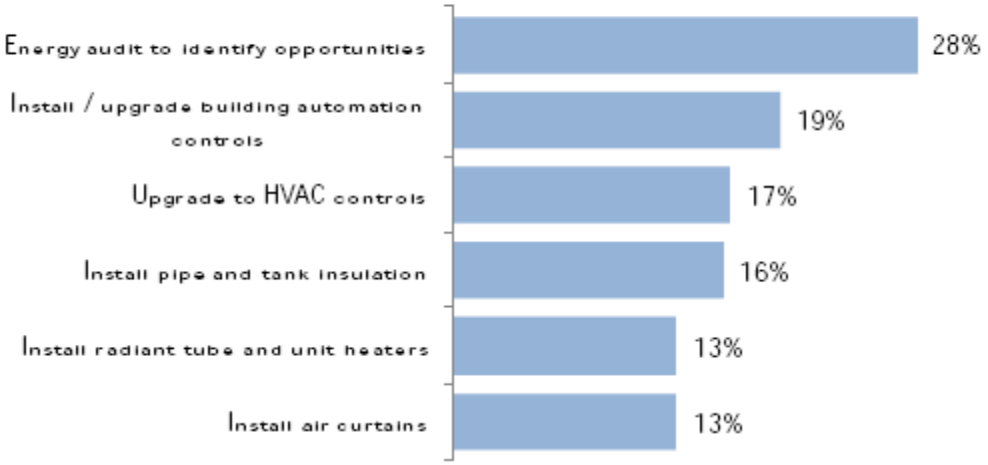
10.3 Please explain why PNG chose to include only the Furnace Tune-Up and Smart Thermostat measures in the proposed residential DSM program, and not the other measures.

"A majority (70%) of respondents indicated they were either *not very knowledgeable* or *not at all knowledgeable* about renewable energy sources like bio-methane (Table 36). Indeed, only 5% felt they were either *extremely* or *very* knowledgeable and another one-quarter (25%) indicated they were *somewhat* knowledgeable. Awareness of bio-methane did not differ significantly by region or by customer size. Facilitating awareness and understanding of bio-methane prior to launching a bio-methane initiative will necessary to improve take-up." [pdf p.430]

10.4 Does PNG intend to include customer education in its roll-out of biomethane?

"[Commercial Survey Results] Program ideas attracting the most interest from respondents (indicated they were either *extremely* or *very* interested) included an energy audit to identify opportunities to save energy (28% very or extremely interested), a program to install or upgrade building automation controls (19%), and a program to upgrade HVAC controls (17%) (Figure 15). In fourth position, 16% of commercial respondents expressed interest in a program to install pipe and tank insulation." [pdf p.450]

Figure 15: Interest in Programs and Services – Commercial Customers
Percent of Respondents – Very or Extremely Interested



"PNG proposes a Commercial energy efficiency program area that includes the following programs:

a) HVAC Controls;
b) Efficient Boilers;
c) Efficient Water Heaters; and
d) Efficient Kitchens." [DSM Plan, Appendix F, at pdf p.249]

10.5 Please explain how the proposed four Commercial programs in the 2019 DSM Plan relate to the measures in which Commercial Customer respondents expressed the most interest in the 2019 Customer Survey. Which of the measures addressed in the Survey are included in the proposed DSM portfolio?

4. New Opportunities and Innovation

11.0 Topic: Remote Communities
Reference: Application, Exhibit B-1, Section 4.1, Remote Communities, p.63, pdf p.81

"PNG has identified a number of northern communities that are currently relying on propane for their primary space and water heating requirements, and who are requesting natural gas service from PNG. These communities are small, often consisting of a few hundred potential residential and commercial customers each having propane tanks on their property. All are remote from PNG's existing gas distribution systems and extensions of PNG's distribution mains are therefore, typically not economic."

"...In the four years since filing its 2015 Resource Plan, PNG has not proceeded beyond screening level assessments of potential opportunities for providing LNG/CNG to remote communities."

"PNG continues to work with communities desiring natural gas service to ascertain current and projected loads."

11.1 Which remote communities is PNG continuing to work with regarding potential natural gas service?

12.0 Topic: Natural Gas for Transportation
Reference: Application, Exhibit B-1, Section 4.2, Natural Gas for Transportation, p.63, pdf p.81

"PNG continues its efforts to develop the market for CNG/LNG for the transportation and mobile equipment sector in its service areas as part of its general business development efforts. At this time, PNG has not identified any action-able opportunities."

12.1 Does PNG anticipate seeking Commission approval if it decides to move forward with natural gas for transportation?

13.0 Topic: Innovation
Reference: Application, Exhibit B-1, Section 4.3, Innovation, p.64, pdf p.82

"PNG is active in the evaluation of a broad range of pre-commercial technologies that enable many different ways to reduce emissions. PNG is a participant in the Natural Gas Innovation Fund (NGIF) created by the Canadian Gas Association (CGA) to support the funding of cleantech innovation in the natural gas value chain. This includes actively working with the NGIF to identify technology that is nearing commercialization for installation at demonstration sites in PNG's service territory."

13.1 In the context of the Long-term Resource Plan Objectives and energy use and climate action policies discussed in Section 1.4, does the 2019 Consolidated Resource Plan include an enhanced emphasis on support for innovation designed to reduce emissions?

13.2 Please describe the nature and timeline for the "technology that is nearing commercialization for installation at demonstration sites in PNG's service territory."

14.0 Topic: Renewable Natural Gas
Reference: Application, Exhibit B-1, Section 4.4, Renewable Natural Gas, p.63, pdf p.82

"PNG adopts a broad interpretation of "Renewable Gas" that includes landfill gas, biogas generated from digesters fed from manure, agricultural waste and household organics, or from woody biomass. In addition, synthetic methane and hydrogen, generated either through electrolysis of water, using electricity from low carbon sources, or hydrogen generated from natural gas through steam reformation in concert with carbon sequestration of the associated GHG emissions, are all considered under the definition of Renewable Gas." [p.66, pdf p.84]

14.1 Is PNG's interpretation of "Renewable Gas" aligned with "Renewable Gas" in the CleanBC Plan? If not, please explain.

15.0 Topic: Renewable Natural Gas
Reference: Application, Exhibit B-1, Section 4.4.1, PNG's RNG Strategy, p.68, pdf p.81;

"In light of the GGRR voluntary five percent RNG target and the CleanBC 15 percent RNG goal by 2030, PNG intends to develop a portfolio of RNG supply. PNG expects that such supply will initially be in the form of biomethane, but that other forms of RNG identified in the previous section, will also be pursued. PNG expects to acquire RNG, either through entering into supply agreements with third parties, or by developing its own supply projects. PNG anticipates adopting and filing for approval with the BCUC, a similar set of principles governing its ability to develop RNG supply infrastructure, as the BCUC has approved for FEI. PNG expects to begin acquiring RNG supply by late 2020 or 2021.

PNG estimates that, in order to meet the CleanBC target of 15 percent RNG supply, PNG will need to acquire between 950 to 1,500 TJ of RNG. PNG has reflected the reduction of GHG emissions associated with the deliveries of RNG to its customers in Table 18, below." [underline added, footnote deleted]

15.1 How does PNG intend to recover the cost of Renewable Natural Gas? Will the cost be included in the Commodity Charge? Or will customers be invited to voluntarily pay a premium price for RNG?

5. GHG Reduction Plans

16.0 Topic: GHG Emissions
Reference: Application, Exhibit B-1, p.

Table 19 shows 2018 PNG direct GHG emissions of 39,000 tCO_2e aggregated across all facilities and from all sources by Function, and by Source.

16.1 Please provide a graph and table showing PNG's aggregated direct GHG emissions (in tCO_2e and as a percentage of total) by year for the years for which data is available. Please note any assumptions, such as changes in the CO_2 equivalence of methane.

16.2 Does PNG observe a trend in its historical annual direct aggregate GHG emissions? If so, what are the contributing factors?

17.0 Topic: GHG Reduction Plan
Reference: Application, Exhibit B-1, Section 5.3, PNG GHG Reduction Plan, p.71

"PNG has developed a GHG reduction plan that identifies the sources of PNG's GHG emissions, evaluates opportunities to reduce those emissions, and sets out a multi-year plan for reducing emissions from those sources."

17.1 Please file a copy of PNG's GHG Reduction Plan.

18.0 Topic: Methane Regulation
Reference: Application, Exhibit B-1, Section 5.3, PNG GHG Reduction Plan, p.71, pdf p.89; p.16, pdf p.34

"The BC OGC Methane Regulations come into force January 1, 2020 with provisions affecting the operation of PNG facilities coming into effect January 1st, 2022. PNG has identified two near-term opportunities that meet the requirements to reduce venting and fugitive emissions, namely the replacement of the natural gas powered starter and natural gas powered actuators at compressor station R1." [p.71, pdf p.89, underline added]

BCSEA understands "BC OGC Methane Regulations" to refer to the Drilling and Production Regulation, B.C. REG. 282/2010 amended by B.C. Reg. 286/2018, under the *Oil and Gas Activities Act*.

"The BC Oil and Gas Commission (BC OGC) has introduced new regulations to reduce methane emissions from upstream oil and gas operations to meet or exceed federal and provincial methane emission reduction targets. The amendments to the Drilling and Production Regulation come into effect on January 1st, 2020. Developed with input from environmental groups and industry, the new regulations address the primary sources of methane emissions from B.C.'s upstream oil and gas industry. The changes include enhancements to requirements for leak detection and repair, designed to ensure leaks are detected and repaired quickly. Additionally, robust data management and reporting requirements to ensure transparent reporting of industry actions are under development. The new regulations and methane reduction measures align with the Province's CleanBC plan." [p.16, pdf p.34]

18.1 Please outline the provisions of the OGC Methane Regulations that come into effect on January 1, 2022 and affect the operation of PNG's facilities. What are the new requirements that affect PNG?

18.2 Will "the replacement of the natural gas powered starter and natural gas powered actuators at compressor station R1" entirely meet the new 2022 Methane requirements applicable to PNG? Are the additional mitigation measures discussed in Section 5.3 required to meet the Methane Regulation?

18.3 Please confirm, or otherwise explain, that PNG intends to implement the GHG reduction actions discussed in Section 5.3.

18.4 Please provide the timeframe and cost estimates for implementation of the GHG reduction actions discussed in Section 5.3.

18.5 By how much are PNG's GHG emissions expected to decrease as a result of the implementation of the OGC Methane Regulations.

6. Residential and Small Commercial Demand

19.0 Topic: Residential End Use Study
Reference: Application, Exhibit B-1, p.73, pdf p.91

"PNG's residential demand forecast is based on a residential end-use model that predicts the average residential use per account based on a number of influencing factors including dwelling type, construction, the numbers and types of natural gas appliances in the home, and the behaviour of residents. In 2013,

PNG completed a residential end-use survey (2013 REUS) that collected information on factors influencing residential demand including: residential dwelling types, amount of insulation, types and numbers of natural gas and electric appliances, the age of natural gas furnaces and hot water heaters, and the number of occupants as well as their energy use behaviour." [underline added]

19.1 When does PNG intend to produce a new Residential End Use Study? Will PNG have a new REUS report for its next Consolidated Resource Plan?

20.0 Topic: Natural Gas as Main Fuel for Heating
Reference: Application, Exhibit B-1, Section 6.2 Residential End-Use Characteristics, p.73, pdf p.91

PNG provides statistics on the percentage of residential dwellings that use natural gas as the main fuel for heating.

20.1 Does PNG provide service to all residential dwellings, including where natural gas is not the main fuel for heating?

20.2 What is the source(s) of the data presented in Figures 12 to 16? If the sources are limited to the 2013 REUS and the 2019 Customer Attitudes Survey, how does PNG take into account residential dwellings not served by PNG?

7. Demand Forecasting

21.0 Topic: Consolidated Demand Forecasting
Reference: Application, Exhibit B-1, Section 7 Demand Forecasting, p.77, pdf p.95

21.1 Please explain why the 2019 Consolidated Resource Plan does not provide any Consolidated results in the Demand Forecasting section.

21.2 Please provide Consolidated versions of the tables and figures in Section 7.

22.0 Topic: Trends Influencing Demand
Reference: Application, Exhibit B-1, Section 7.2 Trends Influencing Demand

22.1 Does PNG consider that lower forecasted Use per Account is a trend that will impact demand by putting upward pressure on delivery rates? If so, how is this reflected in the Consolidated Resource Plan? If not, why not?

22.2 Please provide a version of Figure 18 showing the number of households (not percentage change) for PNG-W, PNG(NE), and consolidated.

22.3 Please provide a version of Table 20 showing the number of residential households by type for PNG-W, PNG(NE), and consolidated.

22.4 Please provide a version of Figure 19 and Figure 20 showing New Housing Mix by number for Fort St John, Dawson Creek, PNG-West, and consolidated.

23.0 Topic: Natural Gas and Electric Baseboard Heaters, New Construction
Reference: Application, Exhibit B-1, Penetration of Electric Space Heat, p.80, pdf p.98

"The price competitiveness of natural gas with respect to electricity, and the public's perceptions of the environmental impact of burning fossil fuels in general, and natural gas in particular, will determine to some degree new home buyers' preference for natural gas space heating. The other determinant is the economics of installing natural gas forced air furnaces or boilers versus baseboard heaters in new construction, without regards to the higher heating costs associated with electric baseboards." [underline added]

23.1 Please provide PNG's analysis of the "economics of installing natural gas forced air furnaces or boilers versus baseboard heaters in new construction." Please specify the assumed purchase and installation costs of the systems that were compared.

24.0 Topic: Air Source Heat Pumps
Reference: Application, Exhibit B-1, Penetration of Electric Space Heat, p.80, pdf p.98

PNG states:

> "CleanBC policy actions promoting the electrification of space heating, in particular the current incentives for air source heat pumps (ASHP), are expected to have only a small impact on residential and commercial space heating load in PNG's service territories. While the heat pumps can exhibit efficiencies great [sic] than one, they do so only in more temperate climates. At winter temperatures commonly experienced in most of PNG's service areas, air source heat pumps are no more efficient than electric baseboard heaters. Only in the western-most parts of PNG's service territory - Prince Rupert, Kitimat and possibly Terrace – would the efficiency gain provided by ASHP's close the cost gap between electricity and natural gas." [underline added]

24.1 What is the basis for PNG's statement that heat pumps can achieve efficiencies greater than one only in more temperate climates?

24.2 Please describe PNG's level of awareness of cold climate heat pumps.

24.3 In preparing the 2019 DSM Plan did PNG take into account up-to-date information on the availability and performance of heat pumps designed for PNG's climate zones?

24.4 Would PNG agree that in recent years heat pumps designed for cold climates have become increasingly available?

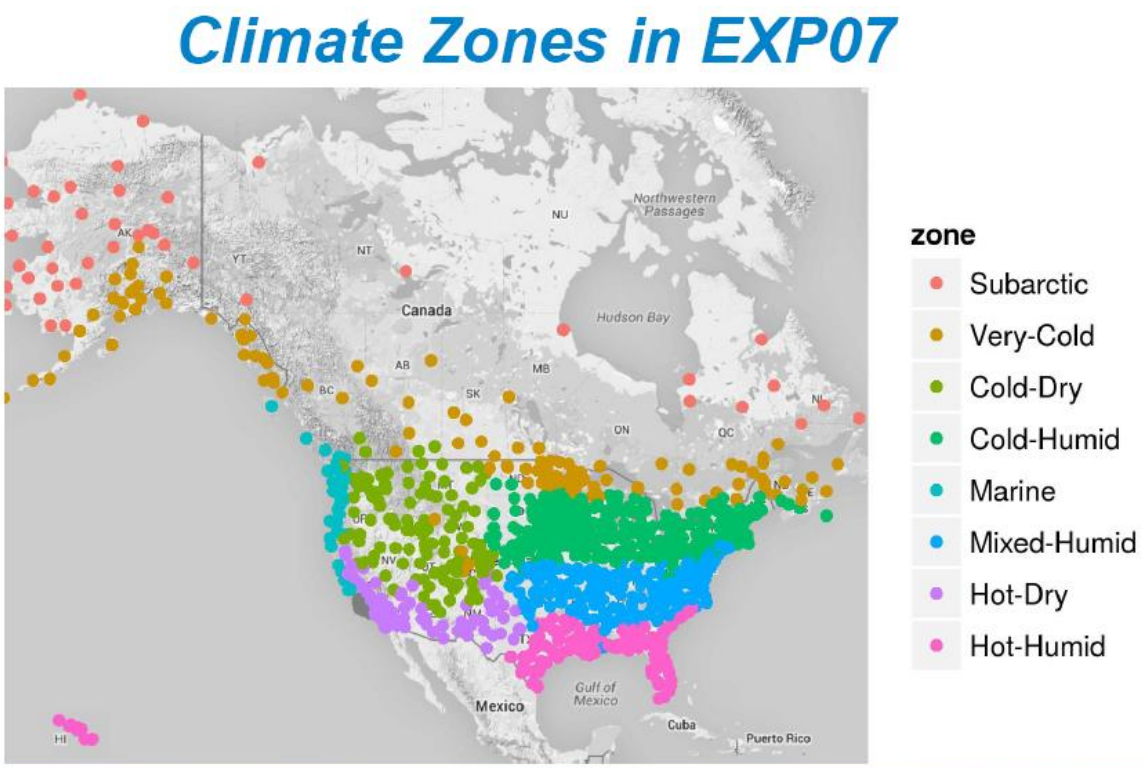
24.5 Please list the cold climate heat pumps and their cold weather specifications that PNG took into account in concluding that "At winter temperatures commonly experienced in most of PNG's service areas, air source heat pumps are no more efficient than electric baseboard heaters."

25.0 Topic: Air Source Heat Pumps
Reference: Application, Exhibit B-1, Penetration of Electric Space Heat, p.80, pdf p.98

CSA Group is developing "Load-based and Climate-Specific Testing and Rating Procedures for Heat Pumps and Air Conditioners," EXP07: at https://publicreview.csa.ca/Home/Details/3313.

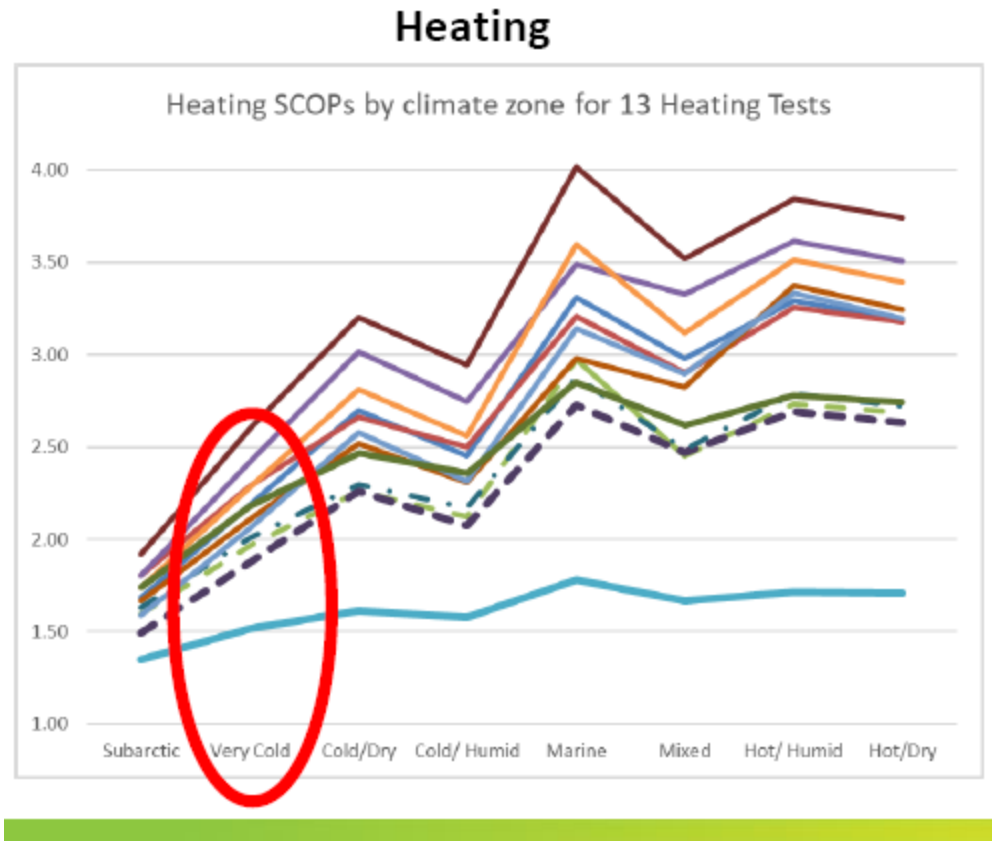
On November 26, 2019, the Northwest Energy Efficiency Alliance presented "EXP-07 Preliminary Results: A new load-based test procedure, Variable capacity heat pumps": https://conduitnw.org/Handlers/conduit/FileHandler.ashx?RID=4967.

The authors describe converting the Coefficient of Performance concept to a climate specific Seasonal Coefficient of Performance measure based on recognized Climate Zones shown in the following map on page 9. The PNG service territory appears to be in the Very-Cold climate zone.



The authors report on a 2019 Lab Evaluation of 12 ductless and 1 ducted air source heat pumps. A summary graph showing Seasonal Coefficients of Performance (SCOPs) for 13 heating tests grouped by climate zone is shown on page 27, reproduced below. The

oval shape added by BCSEA highlights SCOPs ranging from 1.5 to 2.5 for the Very-Cold climate zone.



25.1 Is PNG's service territory in the Very Cold climate zone in the classification used in the NEEA presentation?

25.2 Is PNG familiar with the work of the Canadian Standards Association (CSA), the Northwest Energy Efficiency Alliance (NEEA) and other organizations to implement testing procedures to assess the heating Seasonal Coefficient of Performance of air source heat pumps for climate zones across North America?

25.3 Would PNG agree that air source heat pumps can achieve seasonal coefficients of performance substantially greater than unity even in the Very Cold climate zone?

26.0 Topic: Minimum Efficiency of Residential Gas Furnaces
Reference: Application, Exhibit B-1, Section 7.2.3 Residential Energy Efficiency Retrofits, p.81, pdf p.99

"As discussed in Section 2.1.1.2, changes to the federal Energy Efficiency Regulations are set to increase the minimum efficiency of most residential furnaces types to 95 percent. Over time, existing low- and mid-efficiency furnaces

will be replaced with high-efficiency models, significantly lowering the amount of natural gas consumed for space heating in those dwellings."

26.1 Are the increases in the minimum efficiency standards applicable to new natural gas furnaces in PNG's service territory a significant factor affecting PNG's resource plan over the planning period?

26.2 While the subheading refers to "retrofits," please confirm, or otherwise explain, that the increasingly stringent regulatory requirements for higher-efficiency residential gas furnaces also affects residential load through new construction and the retirement/replacement of old housing stock.

27.0 Topic: Industrial Fuel Gas
Reference: Application, Exhibit B-1, Section 7.2.4 CleanBC Program for Industry, p.81, pdf p.99

"New electric transmission and distribution infrastructure will be needed to enable industrial processes to switch to electricity, from natural gas, or other carbon intensive fuels. The electrification strategy is targeted particularly at the natural gas upstream sector, with the aim of making B.C.'s natural gas and LNG industries the lowest carbon emitting in the world. PNG serves a number of industrial fuel gas loads in its Fort St. John and Tumbler Ridge service areas that comprise five and 70 percent of each system's throughput, respectively."

27.1 Please identify the locations in the 2019 Consolidated Resource Plan where PNG takes into account the impact of low-carbon electrification on PNG's industrial fuel gas loads.

27.2 To what extent, if at all, does the Reference Scenario demand forecast take into account the impact of low-carbon electrification on PNG's industrial fuel gas loads?

27.3 To what extent, if at all, does the DSM Plan include measures to assist PNG customers to reduce their industrial fuel gas loads?

27.4 Please provide the quantities (in GJ per year) that correspond to "industrial fuel gas loads in ... Fort St. John and Tumbler Ridge service areas that comprise five and 70 percent of each system's throughput, respectively."

28.0 Topic: Gross Demand Forecasts
Reference: Application, Exhibit B-1, Section 7.3 Annual Demand Forecast, p.81, pdf p.99; Appendix D, Annual Demand, pdf p.186; Appendix E, Design Day Demand, pdf p.199

The text describes the tables in Appendix D as showing <u>gross</u> annual demand, although the tables don't specify.

28.1 For greater certainty, please confirm that the tables in Appendix D are for gross annual demand, and that the tables in Appendix E are for <u>gross</u> design day demand forecast.

28.2 Does the Application contain demand and design day demand forecasts after (net of) demand-side measures? If so, please identify the location. If not, please provide after-DSM forecasts of demand and design day demand.

29.0 Topic: Use per Account
Reference: Application, Exhibit B-1, Section 7.3.1.2 Use per Account (UPA) Forecast, p.85, pdf p.103

"To reflect the impact of the CleanBC Plan, namely an increased focus on the electrification of residential heating, PNG is forecasting a decrease in the portion of gas space heating in new construction SFD's and MFD's over the forecast period, with the portion of new SFD's and MFD's heated by gas in the Fort St. John, Dawson Creek and Tumbler Ridge areas declining from 95 percent in 2020 to 78 percent in 2038. Similarly, the portion of dwellings heated by natural gas in the PNG-West region declines from the historical average 85 percent, to 70 percent in 2038." [p.86, pdf p.104]

29.1 What role does PNG see for itself in contributing to the CleanBC Plan's focus on electrification of residential heating over the forecast period?

29.2 What is the basis for the size of PNG's estimate of the decrease in the portion of gas space heating in new construction SFDs and MFDs over the forecast period?

29.2.1 Does PNG assume electrification would use baseboard heaters or heat pumps?

29.2.2 Is PNG's forecast sensitive to whether electrification uses baseboard heaters or heat pumps?

29.3 For Figures 26, 27 and 28, showing Residential Use per Account, Historical and Forecast, please confirm that the Actual data is weather normalized. Alternatively, please provide versions showing normalized Actual data.

30.0 Topic: Estimated Useful Life of standard and mid-efficiency furnaces
Reference: Application, Exhibit B-1, p.87, pdf p.105

"PNG has forecast the replacements of standard and mid-efficiency furnaces based on a service life of 30 years."

30.1 Please provide the basis for the assumed service life of existing standard and mid-efficiency furnaces.

30.2 Is PNG aware of the estimated useful life of standard and mid-efficiency furnaces used by FEI, or other natural gas energy efficiency program implementers? If yes, please provide the values used.

31.0 Topic: RECAP
Reference: Application, Exhibit B-1, Section 7.3.4 RECAP and Forecast Demand, p.105, pdf p.123

"On June 28, 2019, PNG filed an application with the BCUC regarding the Process for Allocation of Reactivated Capacity (RECAP) and approval of a Large Volume Industrial Transportation Rate (RS 80)." [p.123]

"In Section 7.3.4, PNG discusses the RECAP process. PNG has not reflected any outcomes of the RECAP in any of its forecasting scenarios. At this time, PNG has no clear indication of the outcome of the RECAP and will not speculate on any likely uptake of spare capacity. At this time, the PNG-West system, as it is currently operated, has ample capacity to meet expected demand outside of the RECAP process." [p.19]

31.1 Would Commission approval of the RECAP application cause PNG to prepare a new or amended Consolidated Resource Plan sooner than is currently planned?

31.2 If the Commission has issued a decision in the RECAP proceeding by the time PNG responds to these information requests, please provide a short summary and indicate how the decision affects the 2019 Consolidated Resource Plan.

32.0 Topic: Annual Demand Forecast
Reference: Application, Exhibit B-1, Section 7.3.6 Annual Demand Summary, p.106, pdf p.124

32.1 The graphs in section 7.3.6 (Figures 43 to 46, for Reference Scenario Annual Demand for the four service areas) show more categories than are shown in the tables in Appendix D (pdf pp.187, 190, 193, 196). Please provide tables corresponding to Figures 43 to 46.

32.2 It is difficult to distinguish some of the colours in Figures 43 to 46. Please clarify, such as by listing the items in the legend vertically in the order they appear in the bars.

33.0 Topic: Sensitivity Analysis
Reference: Application, Exhibit B-1, Section 7.4 Sensitivity Analysis, p.110, pdf p.128

"The scenarios are based on changes to the residential and small commercial demand resulting from changes in the penetration of natural gas as the fuel for space and water heating applications in response to the perceptions of customers regarding the GHG emissions of natural gas and the relative cost advantage of natural gas over electricity, driven in part through changes to the B.C. carbon tax as well as eventual federal and provincial regulations mandating a blend of RNG in natural gas deliveries to end-use customers.[58] As well, the scenarios reflect varying degrees to which the CleanBC targets for improvements to the energy efficiency of existing and new construction are met.

[58] Such as, for example the Federal Clean Fuel Standard applicable to natural gas, and the CleanBC 15% RNG target." [p.111, pdf p.129]

33.1 How does PNG differentiate between the Reference Scenario and the Competitive Electricity Scenario? Does the Reference Scenario include

no changes to demand due to government policy and customer concerns regarding GHG emissions?

33.2 Please confirm, or otherwise explain, that the Sensitivity Analysis is limited to Residential and Small Commercial customers. If confirmed, please explain why PNG excluded Medium, Large and Industrial customers from the sensitivity analysis.

33.3 Would PNG agree that all of the factors supporting the Competitive Electricity Scenario discussed in the above-quoted paragraph, apply to a greater or lesser extent to Medium, Large and Industrial customers?

33.4 Please provide a demand forecast sensitivity analysis that includes all of PNG's sales customer classes, not just Residential and Small Commercial. In addition to providing the results for each service area, please provide the results on a Consolidated basis.

33.5 Please confirm, or otherwise explain, that the Sensitivity Analysis is based on gross demand.

"The underlying growth in households and small commercial enterprises remains the same in all scenarios, while the capture rates are adjusted to reflect varying degrees of probability that these new households and commercial enterprises become customers of PNG."

33.6 Tables 28 and 29 and Figures 53 to 58 focus on changes to Use per Account. Please confirm, or otherwise explain, that these tables and figures do not take into account differences between the Scenarios in changes regarding capture rates.

33.6.1 Please confirm, or otherwise explain, that Tables 30 to 33 and Figures 59 to 62 do include differences between the Scenarios in changes regarding capture rates.

8. Demand Side Management

34.0 Topic: DSM Expenditure Schedule
Reference: Application, Exhibit B-1, Section 8. Demand Side Management, p.126, pdf p.144

"Expenditures associated with the 2020 – 2022 ECI Plan are presented in Table 38. PNG is requesting BCUC approval of expenditures related to the ECI portfolio for 2020 that are in addition to those previously approved. PNG is also requesting approval of expenditures for two additional years (2021 and 2022) to fund an expanded ECI portfolio. Based on total expenditures over three years of $2.57 million accruing to a ratebase deferral account, and an amortization of those expenditures over five years, consistent with PNG's current treatment of expenditures that has been approved by the BCUC, PNG estimates the impact to its residential customers to be in the neighbourhood of $8 per year." [pp.129-130, underline added]

Table 38: Summary of expenditures

Summary: New and Existing Programs and Initiatives					
Item		2020	2021	2022	Total
		(F/C)	(F/C)	(F/C)	(F/C)
Existing Programs and Initiatives	(a)	$ 378,800	$ 487,900	$ 514,900	$ 1,381,600
New Programs and Initiatives	(b)	$ 402,200	$ 392,200	$ 392,200	$ 1,186,600
Total Forecast Expenditures	(c)	$ 781,000	$ 880,100	$ 907,100	$ 2,568,200
Approved Expenditures (G-121-19)	(d)	$ 290,000	$ -	$ -	$ 290,000
Variance (Actual - Approved)	(c) - (d)	$ 491,000	$ 880,100	$ 907,100	$ 2,278,200

34.1 For greater certainty, please confirm that PNG is seeking Commission acceptance of a DSM Expenditure Schedule for 2020, 2021 and 2022 in the amounts shown on the last row of Table 38, noting that for 2020 the amount for which acceptance is requested ($491,000) is in addition to the amount ($290,000) accepted in the compliance filing pursuant to Order G-121-19 (as indicated in Table 36).

34.2 For greater certainty, please specify the assumptions behind the estimated impact to residential customers "in the neighbourhood of $8 per year" of implementation of the 2020-2022 DSM Expenditure Schedule.

34.2.1 Please provide a corresponding estimate of the impact on commercial customers.

35.0 Topic: DSM Scenarios
Reference: Application, Exhibit B-1, p.21; Section 8.3 Alternative DSM Scenario, p.130, pdf p.148

On page 21 of the Application, PNG states:

> "PNG presents its analysis of a "reference" and "high DSM" funding scenarios in Section 8. PNG has not included an analysis of a "low DSM" funding scenario. PNG submits that a low DSM funding scenario corresponds to a DSM portfolio that meets the adequacy requirements of the DSM Regulation only." [p.21, underline added]

In Section 8.3 Alternative DSM Scenario, PNG discusses a "Proposed ECI Portfolio" and a "2017 CPR Market Potential." PNG states:

> "PNG has based the reference funding scenario on the forecast energy savings of the 2020 – 2022 ECI portfolio assuming a continuation of a similar level of funding in 2023 and beyond, with market saturation occurring after five years, in 2027.
>
> PNG has developed a "high DSM" scenario based on the results of the 2017 CPR Market Potential Review that estimated three percent in cumulative gas savings market potential as a percentage of consumption

by 2022, increasing by 0.5 percent annually and reaching 7.9 percent by 2035. [p.130, pdf p.148, footnote omitted]

35.1 For greater certainty, please confirm that the Proposed ECI Portfolio is the same as the first three years of the Reference Scenario.

"Forecast energy savings in terajoules (TJ) and as a portion of demand forecast under the Reference scenario are presented graphically and in tabular form in Figure 64, Figure 65 and Table 39, respectively. The impacts are presented in the context of the demand across all four divisions of PNG, excluding demand from Industrial Sales and Transport. Demand from LNG Canada, a commercial customer in PNG-West, has also been excluded. While the ECI Commercial program can be accessed by PNG's industrial customers, the existing and proposed initiatives within the Commercial program are most applicable to small and larger commercial customers. Industrial customers include Campus Energy's Regional LNG facility in Dawson Creek, CNRL's fuel gas operations in Fort St. John and Tumbler Ridge, as well as pellet plants in PNG-West. Even under an ECI portfolio expanded to achieve the level of energy savings suggested by the 2017 CPR, there is limited opportunity to offer initiatives that would influence the demand of these types of customers. Including only those loads that can be influenced by the ECI programs is therefore appropriate." [pp.130-131, underline added]

35.2 Please explain the paragraph quoted above. Is PNG saying that the 2017 CPR Market Potential scenario, i.e., "high DSM," does not include any DSM savings from industrial customers? Or, is PNG saying that the 2017 CPR Market Potential scenario is not achievable because it does assume DSM savings from industrial customers?

35.3 In Figure 64: Forecast Gross and Net Annual Demand (TJ), what is the dashed purple line?

35.4 Please provide a version of Table 39 that shows annual energy savings (in TJ) for Proposed ECI Portfolio and 2017 CPR Market Potential, and annual Gross System Load (in TJ) for the years indicated.

35.5 Does PNG have a cost estimate for annual spending in the test period under the 2017 CPR Market Potential scenario? If so, please provide it. If not, please explain why not.

35.6 Please state the criteria and reasons for PNG's choice of the Proposed ECI Portfolio over the 2017 CPR Market Potential scenario for the test period DSM expenditures.

35.7 How did PNG reach the conclusion that there is limited opportunity to offer initiatives that would influence the demand of its industrial customers including Campus Energy's Regional LNG facility in Dawson Creek, CNRL's fuel gas operations in Fort St. John and Tumbler Ridge, as well as pellet plants in PNG-West? Was this based on customer input? Was it based on the PNG CPR report?

35.8 Has PNG examined FortisBC Energy Inc.'s DSM Industrial Program Area to determine if there are energy saving measures or opportunities that would be applicable to PNG's industrial customers? If so, what were the results? If not, why not?

35.9 Has PNG considered contracting with FEI to have some or all of FEI's DSM Industrial Programs made available to PNG's industrial customers?

35.10 Please provide versions of Figure 65 and Table 39 that do not exclude Industrial Sales.

"PNG is proposing an expanded ECI portfolio that will form the foundation for further expansions that may ultimately achieve the theoretical market potential demand reductions. In this iteration of the ECI portfolio, PNG has increased the budget for marketing all programs to its customers, increased the level of activity of its Conservation Education and Outreach (CEO) activities, enhanced the incentives offered by the commercial program, and proposed an effective program fulfilling the needs of its residential customers. Once participation in the ECI programs increase, PNG will be in a better position to assess the actual cost effectiveness of the ECI programs to date, and make an extrapolation of the costs to achieve further reductions approaching the theoretical market potential." [pp.132-133]

35.11 Please explain this paragraph. Are the "proposed expanded ECI portfolio," "this iteration of the ECI portfolio," and the 2020-2022 DSM Expenditure Schedule one and the same? Does "further expansions" refer to DSM in years 2023 and following?

36.0 Topic: DSM Costs Allocation
Reference: Decision and Order G-121-19, page 29

In Decision and Order G-121-19, the Panel approved "PNG's proposed method of allocating the ECI costs between PNG-West and PNG (N.E.) using the market size approach as set out more fully in its Application and approves PNG's proposed allocation of ECI costs amongst customer classes on the basis of their relative contribution to the gross margin in each division as set out more fully in its Application."

The Panel cites PNG's proposed allocation of DSM costs between Divisions as follows, citing Exhibit B-2, BCUC IR 15.1 in that proceeding:

Table 12[137]

Division:	PNG-West	Fort St John /Dawson Creek	Tumbler Ridge
Allocation of DSM costs	51.9%	46.3%	1.8%

36.1 Does PNG propose any change in the currently approved methodology for allocation of DSM costs between Divisions and customer classes?

36.2 Please provide a table showing the proposed allocation of DSM costs by Division for the test period.

36.3 Please provide a table showing the proposed allocation of DSM costs by customer class for the test period. Topic: ECI Annual Report

37.0 Topic: DSM Underspending
Reference: Application, Exhibit B-1, Appendix F, 2019 Demand Side Management Plan, Table 10: Summary of New and Existing Programs, pdf p.243

Table 10: Summary of New and Existing Programs

Summary: New and Existing Programs and Initiatives								
Item	2016	2017	2018	2019	2020	2021	2022	Total
Actual/Forecast Expenditures	(Act)	(Act)	(Act)	(F/C)	(F/C)	(F/C)	(F/C)	(F/C)
Existing Programs and Initiatives	$ 215,244	$ 70,696	$ 126,543	$ 330,733	$ 378,800	$ 487,900	$ 514,900	$ 2,124,816
New Programs and Initiatives	$ -	$ -	$ -	$ -	$ 402,200	$ 392,200	$ 392,200	$ 1,186,600
Total Actual/Forecast Expenditures	$ 215,244	$ 70,696	$ 126,543	$ 330,733	$ 781,000	$ 880,100	$ 907,100	$ 3,311,416
Approved Expenditures	$ 432,403	$ 317,039	$ 349,024	$ 342,000	$ 290,000	$ -	$ -	$ 1,730,466
Variance (Actual - Approved)	$ (217,159)	$ (246,343)	$ (222,481)	$ (11,267)	$ 491,000	$ 880,100	$ 907,100	$ 1,580,950

37.1 Given the substantial underspending during 2016, 2017 and 2018, what specific steps will PNG take to ensure it will be able to spend the requested amounts for 2020, 2021 and 2022?

37.1.1 Please explain why these steps will lead to PNG fully expending its requested budgets.

38.0 Topic: ECI Annual Report
Reference: Pacific Northern Gas Ltd. and Pacific Northern Gas (N.E.) Ltd. Energy Conservation and Innovation Program Funding Application ~ Project No. 1598979, Exhibit B-1, Appendix C, 2017 ECI Annual Report, pdf p.89 (https://www.bcuc.com/Documents/Proceedings/2019/DOC_53180_B-1-PNG-ECI-Program-Funding-Application.pdf)

In the December 2018 ECI 2019-2020 Funding Application, PNG provided the 2017 ECI Annual Report. The current Application does not provide a 2018 ECI annual report.

38.1 Please file the 2018 ECI Annual Report, or indicate when it will be available.

39.0 Topic: Conservation Potential Review
Reference: Application, Exhibit B-1, Appendix V: PNG 2017 Conservation Potential Review, pdf p.548

"The study uses incentive levels and administrative costs derived from FortisBC Gas's historic experience as a reasonable proxy for PNG. The team recognizes that FortisBC Gas's incentive levels and administrative costs may reflect efficiencies from economies of scale and market experience that may not yet be attained by PNG's conservation efforts. Additionally, PNG may pursue different implementation plans that lead to different incentive levels and administrative costs than seen in FortisBC Gas's service territory. As such, the budgets and cost-effectiveness tests are indicative of mature program experience in the region, but may differ from PNG's realized costs in the near term as its DSM programs gain experience and scale." [underline added]

39.1 The cited paragraph suggests that the lack of maturity of PNG's programs could result in higher implementation costs than FortisBC has historically achieved. Please discuss the effect that the relative newness to the markets of PNG's efficiency programs could have in reducing program costs in the near term relative to FortisBC's costs, due to lower market saturation, unsatisfied demand, and other factors.

39.2 When does PNG expect to have a new or updated Conservation Potential Review report?

40.0 Topic: DSM Programs to address New Construction
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf p.219

"The low rate of development across PNG's service areas challenges the feasibility of programs aimed at the new construction sector. New home starts average less than 500 per year and new commercial construction starts average less than 50 per year."

In Directive 7 of Order G-203-15A, the Commission states:

> "The Panel directs PNG to include the results of its research and analysis of the applicability of the programs currently offered by FEI in the next DSM expenditure schedule filing, and to specifically include a review of the costs and benefits of offering 'new construction' program(s) to mitigate lost DSM opportunities." [underline added]

40.1 Does PNG agree that foregoing opportunities for efficiency measures in new construction can result in lost DSM opportunities?

40.2 Please fully explain why, in PNG's view, the low rate of development across PNG's service areas "challenges the feasibility of programs aimed at the new construction sector."

40.3 Is PNG saying that DSM programs aimed at the new construction sector in its service areas in the test period would not have acceptable benefit/cost results?

40.4 Does PNG consider that there is a minimum size below which a DSM program during the test period would not be acceptable (or feasible)? If so, please provide the rationale and the method by which PNG determines the minimum acceptable program size.

40.5 Would PNG agree that one of the advantages of having a relatively small amount of residential and commercial new construction in its service areas, compared to, say, FEI, is that there are fewer builders to engage in a DSM program aimed at new construction?

40.6 If program size is a barrier, has PNG explored arrangements with FEI, or BC Hydro, for delivery of a new construction DSM program?

40.7 Please provide any data that PNG has regarding the number of home builders who completed homes that connected to PNG gas service in each of 2016, 2017, and 2018, and the number of homes that each completed.

40.7.1 How many builders in total for each year completed homes that connected to PNG gas service in 2016, 2017, and 2018?

40.7.2 How many homes did each builder complete in each year? Please provide the data in table format such as is illustrated below:

Anonymized Home Builder ID	# of electrically-heated completed home units with PNG Service		
	2016	2017	2018
Builder A	12	7	14
Builder B….			
Anonymized Home Builder ID	# of gas-heated completed home units with PNG Service		
	2016	2017	2018
Builder A	8	4	11
Builder B….			

40.8 Please provide any data that PNG has regarding the number of commercial builders who completed commercial buildings that connected to PNG gas service in each of 2016, 2017, and 2018, and the number of commercial buildings that each completed.

40.8.1 How many commercial builders in total for each year completed commercial buildings that connected to PNG gas service in 2016, 2017, and 2018?

40.8.2 How many commercial buildings did each builder complete in each year? Please provide the data in table format such as is illustrated below:

Anonymized Commercial	# of electrically-heated completed commercial buildings with PNG Service

Builder ID	2016	2017	2018
Builder AA	2	4	1
Builder BB….			
Anonymized Commercial Builder ID	# of gas-heated completed commercial buildings with PNG Service		
	2016	2017	2018
Builder AA	2	0	3
Builder BB….			

41.0 Topic: Conservation Potential Review
Reference: Application, Exhibit B-1, Appendix V: PNG 2017 Conservation Potential Review, pdf p.541.

"The whole facility end-use dominates the residential sector, accounting for 70% of the total savings potential. This is largely driven by ENERGY STAR Homes, which have by far the most market potential of all residential measures…."

41.1 Please confirm that the CPR prepared for PNG determined that a residential new construction market opportunity centered on ENERGY STAR Homes had "the most market potential of all residential measures."

41.2 Which DSM new construction programs for comparatively-sized utilities has PNG reviewed, if any?

41.2.1 Please discuss the applicability to PNG and its customers of any of the DSM new construction programs for comparatively-sized utilities that PNG has reviewed.

42.0 Topic: Conservation Potential Review
Reference: Application, Exhibit B-1, Appendix V: PNG 2017 Conservation Potential Review, pdf p.548 and pdf p.552

Table 5-2 and Table 5-3 both have a column heading label "Sector" but neither table indicates in the column which sector the figures apply to.

42.1 Please provide a version of each table that includes appropriate sector labels.

43.0 Topic: Conservation Potential Review
Reference: Application, Exhibit B-1, Appendix V: PNG 2017 Conservation Potential Review, pdf p.544

Figure 5-17. Top 40 Measures for Gas Energy Market Savings Potential in 2025 (TJ/year)

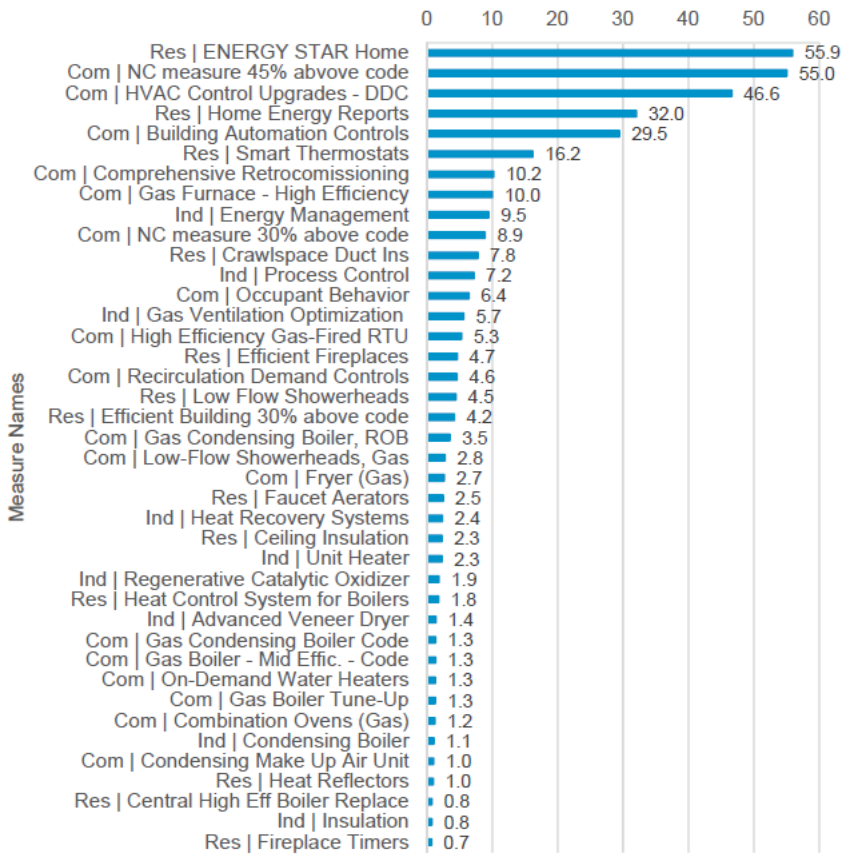


Figure 5-17 shows the top 40 measures for the <u>market</u> potential.

43.1 Please reproduce Figure 5-17 showing the top 40 measures for the <u>economic</u> potential.

43.2 Please provide a full listing of the measures that were included in the technical potential, economic potential, and market potential, along with the estimated costs and savings for each at the measure and aggregated measure level, and the benefit-cost test ratios (TRC, UC, PCT and RIM).

44.0 Topic: Conservation Potential Review
Reference: Application, Exhibit B-1, Appendix V: PNG 2017 Conservation Potential Review, pdf p.554

Appendix A of the Conservation Potential Review, under the heading "Detailed Model Results," says:

> "For granular Base Case results from the model, see attachments
>
> - 'PNG_Appendix_A1_2017-04-26.xlsx'"

44.1 Please provide the attachment in electronic format with all formulas intact.

45.0 Topic: PNG Current ECI Delivery Partners
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf p.220

"As a small utility with approximately 120 staff, PNG does not have a manager who is fully dedicated to the management of the ECI program. The Manager, Energy Management and DSM is responsible for the development and execution of the ECI programs."

45.1 Please summarize the overall responsibilities of the Manager, Energy Management and DSM, and provide an estimate of the full time equivalent that they are expected to spend on each responsibility.

45.2 Please explain how PNG concluded that it could effectively implement its ECI programs without a full-time DSM Manager.

45.3 Please provide the names of all PNG staff and subcontractors who contributed to the development of this plan, along with the approximate number of hours each contributed.

46.0 Topic: PNG Current ECI Delivery Partners
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf p.220

"BC Hydro, BC's primary electric utility, has been engaged in energy conservation and efficiency for over 15 years."

"PNG has an agreement with FEI whereby FEI shares DSM program information and materials for PNG's use."

46.1 Please explain the strategic support that PNG receives from BC Hydro.

46.1.1 Does PNG have any sharing agreements with BC Hydro, similar to its agreement with FEI?

46.2 Please describe the sharing arrangement that PNG has with FEI.

46.2.1 Specifically, what is the information that FEI shares?

46.2.2 Specifically, how does PNG use the information to advance participation and savings for its ECI programs?

46.2.3 Have FEI and PNG discussed joint implementation of any DSM programs? Please explain.

47.0 Topic: PNG Current ECI Delivery Partners
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf p.221

"PNG has an agreement with BC Hydro to deliver the Energy Saving Kit (ESK) and Energy Conservation Assistance Program (ECAP) programs."

47.1 Please explain the key features of the agreement referenced above.

47.2 Please explain how the agreement benefits PNG customers.

47.3 Please describe any differences between the ESK and ECAP programs that BC Hydro provides its customers when they are also PNG customers, compared with BC Hydro customers who are not PNG customers.

47.4 Have BC Hydro and PNG discussed joint implementation of any DSM programs? Please explain.

48.0 Topic: ECI Guiding Principles
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. p. 223

"PNG has defined its principles to guide the development of the ECI program:

1. Alignment with BC's Energy Objectives;
2. Meet the Adequacy requirement of Section 3 of the Demand-Side Measures Regulation;
3. Develop a portfolio of programs that is cost effective at the portfolio level over the funding period as determined by the appropriate application of the Total Resource Cost/Benefit (TRC) and Modified Total Resource Cost/Benefit (mTRC) as prescribed by Section 4 of the DSM Regulation.
4. Be responsive to the needs and wants of PNG customers as determined by PNG sources, including but not limited to the REUS and 2019 Customer Attitudes Survey;
5. Provide a balanced and consistent approach to assisting residential, commercial, and industrial customers in their energy management and reduction of consumption.
6. Goal of limiting the non-incentive costs of each program at 50 percent of the program expenditure in a given year.
7. Leverage available programs and incentives from other organizations, agencies, and utilities."

48.1 Please define the term "balanced" as used in Guiding Principle 5 above, "Provide a balanced and consistent approach to assisting residential, commercial, and industrial customers in their energy management and reduction of consumption."

48.2 Please explain the rationale for PNG adopting Guiding Principle 6 above, "Goal of limiting the non-incentive costs of each program at 50 percent of the program expenditure in a given year."

48.2.1 Please provide any empirical evidence demonstrating that 50 percent is the most appropriate limit for non-incentive costs.

49.0 Topic: PNG ECI Program Market Intelligence, 2013 REUS
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. p.224

"Approximately 16 percent of PNG's residential customers can be considered low-income households."

"Lower income households were more likely than other groups to choose "not at all interested" in any of the energy efficiency programs suggested on the survey. Similarly, the highest income households were most likely to be "very interested" in any of the programs. Programs where this pattern did not hold included installing programmable thermostats and furnace or heat pump tune-ups, which exhibited broad interest across all income groups."

49.1 Please provide the criteria that were used to define a "low-income household." How does this compare with the definition of "low-income household" in the DSM Regulation?

49.1.1 Do the same criteria also define "lower income households"?

49.1.2 Are the criteria used to define low-income or lower income households consistent with the criteria used to determine eligibility for any of PNG proposed programs?

49.2 Please provide the list of programs that were presented when asking whether a respondent was interested in any of the energy efficiency programs.

49.2.1 Did the survey provide any indication of what the programs were intended to provide to participants, or did respondents base their responses on their prior understanding of energy efficiency programs?

49.3 Please describe any conclusions that PNG has reached, or any decisions regarding its proposed energy efficiency programs that have been made, in part or in whole based on the finding that lower income households were more likely to choose "not at all interested" in any of the energy efficiency programs.

50.0 Topic: PNG ECI Program Market Intelligence, 2013 REUS
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. p.224

"While 32 percent of households claimed to have an ENERGY STAR® qualified model, nearly the same proportion (30 percent) were not sure if their model was ENERGY STAR® qualified or not."

50.1 To what type(s) of appliances or other equipment does this statement refer?

51.0 Topic: 2019 Customer Attitudes Survey
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf pp. 225-227

"Awareness of PNG energy efficiency programs is low. Only 17 percent of residential customers were aware of PNG's low-income program prior to taking the survey. The lack of awareness was common to respondents in all regions, customer sizes, and household incomes. For commercial survey respondents, only six percent were aware of PNG's Commercial Efficient Water Heater Program, three percent were aware of the Commercial Efficient Boiler Program, and one percent were aware of the Commercial Efficient Kitchens Program. There were no statistically significant differences in awareness by region or customer size."

"Residential customer satisfaction with PNG's efforts to help them use energy efficiently is very low, with only 11 percent of respondents satisfied, 49 percent neutral, and 30 percent dissatisfied. The remaining 11 percent were unsure how satisfied they were with PNG's efforts – a response consistent with the low awareness of PNG residential energy efficiency programs. Customers in Fort St. John and Dawson Creek were somewhat more satisfied than their counterparts in PNG-West and Tumbler Ridge (mean satisfaction scores of 5.7 and 5.2, respectively)."

"Survey respondents were asked to express interest in a variety of programs and services to help them reduce their energy use. Residential customers expressed the most interest in a furnace tune-up program (53 percent very or extremely interested), a draft proofing program (44 percent) and programs to upgrade exterior doors and windows (42 percent for each)."

"Program ideas attracting the most interest from commercial survey respondents include an energy audit to identify opportunities to save energy (28 percent very or extremely interested), a program to install or upgrade building automation controls (19 percent), and a program to upgrade HVAC controls (17 percent)."

51.1 Given the low customer awareness and low customer satisfaction that was reported in this survey, particularly among residential customers, please describe the specific steps that PNG has included in its ECI Plan to ensure that its programs will lead to success regarding Guiding Principle 4, "Be responsive to the needs and wants of PNG customers as determined by PNG sources, including but not limited to the REUS and 2019 Customer Attitudes Survey."

51.2 Did PNG assess the merits of a draft proofing program in its ECI Plan? Please explain.

51.2.1 Is draft proofing supported by PNG in any of its proposed programs?

52.0 Topic: DSM Programs Offered in BC and Across Canada, CleanBC Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. pp. 227-229

"A review of the CleanBC Better Homes and Better Buildings websites found that energy efficiency programs noted below are available to PNG's customers. This information helps PNG identify where its efforts have most value."

52.1 How, specifically, has PNG used information regarding CleanBC programs to identify where its efforts have most value?

52.2 What conclusions has PNG reached regarding where its programs have most value based on its awareness of CleanBC programs?

52.3 Please describe all activities undertaken by PNG to encourage or facilitate its customers' participation in CleanBC programs.

52.4 Is it PNG's position that if there is a CleanBC program that addresses certain energy efficiency opportunities—draft proofing, for example—then PNG has no obligation or responsibility to offer similar programs or to coordinate delivery of its programs with CleanBC?

53.0 Topic: Under-served Markets
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. p.234

"The Commission [in Order G-121-10] directed PNG to conduct "a review and discussion of new [energy efficiency] programs for …under-served markets...

"PNG submits that the residential sector is an underserved market in PNG service territory…."

"PNG acknowledges that the industrial sector is also an underserved market in the PNG service territory…."

53.1 Please provide the definition of "under-served market" used by PNG in reaching the conclusions reproduced above.

53.2 Please describe the process and criteria used by PNG to determine that the residential and industrial sectors in PNG service territory are underserved markets.

53.3 Does PNG make any distinctions between various components of the residential sector in terms of how, or by how much, they are underserved?

54.0 Topic: Home Energy Report
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. p.235

"The 2017 CPR lists the "Home Energy Report" as the measure with the second highest market potential, based on achieving savings in natural gas demand of two percent in all single-family detached homes in PNG's service territory at no incremental cost, based on achieving behavioural change.

PNG has determined the underlying assumptions, particularly the assumption regarding cost, to be unreasonable. PNG expects that the delivery of Home Energy Reports to even a portion of single-family detached homes in PNG service territory would come with associated marketing and outreach costs, as well as considerable costs to setup and administer such a program. Therefore

PNG has determined that a program to provide Home Energy Reports is not cost effective."

54.1 Please provide PNG's analysis, including all assumptions and the basis for them, that determined that a Home Energy Report program would not be cost-effective.

54.2 At what level of cost would PNG consider the Home Energy Report program to be cost effective?

55.0 Topic: Commercial New Construction
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. p.236

"In the commercial sector, the 2017 CPR lists "New Construction measure 45 percent above code" as having the highest potential. The offices subsector assumes an incremental cost of $58 per square metre of floor space and 45 percent gas savings over the baseline. PNG estimates new commercial building starts to be less than 50 per year across the entire service territory. PNG therefore concludes that it is not cost effective to deliver a program to this small market segment. In addition, PNG notes that there are incentives available to PNG customers through other organizations."

55.1 Please clarify: is it PNG's position that it cannot offer a cost-effective program to capture the energy savings potential of commercial new construction because it "estimates new commercial building starts to be less than 50 per year?"

55.1.1 If yes, please provide the empirical basis of this determination.

55.1.2 If no, please explain how the statements above support PNG's determination that it cannot offer a cost-effective program for this market subsector.

55.2 Please provide references to all energy efficiency programs targeted to the commercial new construction market sector that are implemented by other Program Administrators that PNG reviewed in development of its proposed Plan.

55.3 Has PNG investigated contracting with FEI or BC Hydro for the delivery of a DSM program(s) for commercial new construction? If so, why has PNG apparently chosen not to pursue this route? If not, why not?

56.0 Topic: Residential Program Area: Efficient Heating
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. pp.244-245

"The Efficient Heating program is designed to improve the visibility and satisfaction of PNG's ECI programs by appealing to a broad segment of PNG's residential customers. A furnace tune up and smart thermostat were identified as the top programs or services that PNG could offer to help customers reduce their energy use."

56.1 How much energy savings does PNG project for an average customer who participates in the Efficient Heating program?

56.1.1 How does this level of energy savings per customer compare with the top ten residential energy saving measures in the economic potential from the 2017 CPR?

56.2 What are the estimated bill savings associated with the energy savings?

56.2.1 How does this level of bill savings per customer compare with the top ten residential energy saving measures in the economic potential from the 2017 CPR?

57.0 Topic: Residential Program Area: Efficient Heating
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. pp.244-245

"Maintaining a furnace and optimizing its use through a smart thermostat can provide more savings than upgrading to an ultra-high efficiency furnace. This can be achieved at a fraction of the cost to the customer, resulting in a payback period measured in months, rather than years. PNG estimates that a furnace tune up and smart thermostat installation would cost an average of $550 per participant. By way of comparison, PNG estimates that an ultra-high efficiency furnace and matching thermostat would cost on average $7,500 to install."

57.1 Please provide the analysis and assumptions that support the statement that "Maintaining a furnace and optimizing its use through a smart thermostat can provide more savings than upgrading to an ultra-high efficiency furnace." Please provide the analysis in electronic format with all formulas intact. Please cite all empirical evidence that PNG relied on in making this determination.

57.2 What is the expected useful life of the energy savings that will result from a furnace tune-up? Please cite all empirical evidence that PNG relied on in making this determination.

57.3 What is the expected useful life of the energy savings that will result from the installation of an ultra-high efficiency furnace? Please cite all empirical evidence that PNG relied on in making this determination.

57.4 Please provide the evidence upon which PNG determined that the average installation cost for an ultra-high efficiency furnace would be $7,500.

57.4.1 What is the AFUE rating of the "ultra-high efficiency" furnace?

57.4.2 What are the estimated monetary savings to PNG customers over the lifetime of the furnace if they have an ultra-high efficiency furnace as compare to a high, medium and low efficiency furnace, respectively?

57.4.3 Did PNG examine the costs of furnaces that it does not consider to be "ultra-high efficiency?"

57.4.3.1 If not, why not?

57.4.3.2 If yes, please provide the estimated costs and associated AFUE ratings for all the categories of furnaces examined by PNG.

58.0 Topic: Energy Conservation Assistance Program (ECAP)
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. pp.246-247

"BC Hydro and PNG have partnered to offer this program to low income households, including renters. The program is delivered by BC Hydro and Ecofitt, and is promoted through several channels, including: bill inserts, print ads, on-line, and partnerships with government ministries and non-profits that serve the low-income population."

Table 12: ECAP Program Summary

PROGRAM SUMMARY		
New/ Retrofit	Partner	Participants/yr
Retrofit	BC Hydro	100
Annual Budget 2020	Annual Gas Savings (GJ)	
$ 48,500	733	
Participant Cost before Incentive	Incentive Amount per Participant	Annual Gas Savings per Participant (GJ)
$ 360	$ 360	7.33
Marketing Costs		
2020	2021	2022
-	-	-
Administration Costs		
2020	2021	2022
12,500	12,500	12,500
Measure Life (years)	Free Ridership	Spill Over Rates
12	0%	0%
COST BENEFIT TESTS		
TRC	mTRC	UCT
0.72	5.22	0.47
PCT	RIM	
5.50	0.18	

BC Hydro and Ecofitt will deliver this program on behalf of PNG, and Table 12: ECAP Program Summary indicates that PNG estimates there will be 100 ECAP participants annually.

58.1 In addition to the PNG customers who participate in the PNG implementation of ECAP (delivered by BC Hydro and Ecofitt), will any PNG customers participate in the BC Hydro implementation of the program? If yes, how many?

58.2 Table 12: ECAP Program Summary indicates that the average per participant annual savings will be 7.33 GJ. Please provide the basis of this savings estimate, by measure.

58.3 What other measures, if any, did PNG consider for inclusion in the ECAP program?

58.3.1 For each measure that PNG considered for inclusion in the ECAP program but did not include, please explain the basis of the decision not to include the measure.

58.3.2 Are there any measures that BC Hydro and Ecofitt provide to BC Hydro customers that are not provided to PNG customers? Please list any such measures.

58.4 Please compare the ECAP program measures as proposed by PNG to the low income energy efficiency program measures offered to the customers of FEI.

58.4.1 Does FEI offer any gas-saving measures to its low-income customers that PNG does not?

58.4.2 If yes, would these measures provide savings for PNG's low-income customers?

58.4.3 If yes, why does PNG decline to offer these measures?

59.0 Topic: Commercial Program Area: HVAC Controls
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. pp.249-250

"PNG proposes a new HVAC Controls program to provide incentives up to 50 percent of the cost to commercial business owners who upgrade their HVAC Controls. Commercial customers would work with the HVAC controls contractor of their choice to propose a HVAC controls system and submit an application for preapproval. Once approved, the work would be completed, and the contractor would show the PNG incentive as a discount on the customer invoice and receive payment from PNG directly.

The HVAC Controls program is designed to appeal to all of PNG's commercial customers and serve as a flagship program to focus communications, increase awareness and draw in participants to other program programs. According to the 2019 Customer Attitudes Survey, a program to install or upgrade building automation controls, and a program to upgrade HVAC controls both resulted in relatively high levels of interest from commercial survey respondents, at 19 and 17 percent, respectively.6 PNG estimates that most of the gas energy savings from "Building Automation Controls" comes from HVAC control upgrades. The CPR lists "HVAC Control Upgrades - Direct Digital Data Control" as having the second highest market potential.

HVAC control systems measure key variables and collect data to help manage temperature, humidity, pressure and ventilation to ensure optimum HVAC system

efficiency. There are a variety of systems available from a host of suppliers. Solutions will be customized for each participant. The energy used by HVAC systems varies with the building type and ranges between 40 and 82 percent. PNG estimates that HVAC controls will save an average of 12 percent of the HVAC energy use."

59.1 Please describe any qualification criteria and/or parameters for "HVAC controls" to be eligible for incentives.

59.2 Please provide any analysis that supports PNG's assumption that "HVAC controls will save an average of 12 percent of the HVAC energy use."

60.0 Topic: Commercial Program Area: Efficient Boilers
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. p.235

Table 16: Efficient Boilers Program Summary

PROGRAM SUMMARY		
New/ Retrofit	Partner	Participants/yr
Retrofit	TBD	4
Annual Budget 2020	Annual Gas Savings (GJ)	
$ 51,000	3,284	
Participant Cost before Incentive	Incentive Amount per Participant	Annual Gas Savings per Participant (GJ)
$ 27,600	$ 8,900	820.90
Marketing Costs		
2020	2021	2022
6,500	6,500	6,500
Administration Costs		
2020	2021	2022
8,900	8,900	8,900
Measure Life (years)	Free Ridership	Spill Over Rates
20	18%	0%
COST BENEFIT TESTS		
TRC	mTRC	UCT
1.61	9.22	2.40
PCT	RIM	
8.10	0.32	

Table 16: Efficient Boilers Program Summary, indicates that PNG anticipates 4 participants per year.

60.1 Please explain why, in PNG's view, it is not reasonable to offer a commercial new construction program based on an estimate of only 50 new commercial buildings in PNG territory per year when it is reasonable to offer the Efficient Boilers program to 4 expected participants per year.

61.0 Topic: Commercial Program Area: Efficient Kitchens
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. p.253

"Launched in June 2018, the Efficient Kitchen program offers customers operating commercial kitchen facilities a free efficient pre-rinse spray valve to effectively remove excess food residue from dishes. The models offered by PNG use less hot water than standard spray valves, thereby saving water and energy."

61.1 What other measures, if any, did PNG consider for inclusion in the Efficient Kitchens program?

61.1.1 For each measure that PNG considered for inclusion in the Efficient Kitchens program but did not include, please explain the basis of the decision not to include the measure.

61.2 Does FEI offer any gas-saving measures to its commercial kitchen customers that PNG does not?

61.2.1 If yes, would these measures provide savings for PNG's commercial kitchen customers?

61.2.2 If yes, why does PNG decline to offer these measures?

62.0 Topic: Natural Gas Innovation Fund
Reference: Application, Exhibit B-1, Appendix F, PNG 2019 DSM Plan, pdf. p.255

"PNG proposes to allocate a small amount of its ECI Program budget to support the development and adoption of new energy technologies through the Natural Gas Innovation Fund (NGIF). Programs funded by PNG may include funding laboratory and field testing of commercial and pre-commercial high efficiency natural gas equipment to demonstrate its viability to builders, HVAC professionals and policy makers; or funding research into the impact of injecting quantities of hydrogen into natural gas distribution systems."

PNG proposes a budget for its contribution to the Natural Gas Innovation Fund (NGIF) of $35,000 in 2020 and $50,000 per year in 2021-22.

62.1 Please provide information about the NGIF, including its organizational structure, mission and vision.

62.2 Please provide a listing of the other funding sources for the NGIF.

62.3 Please describe the projects that the NGIF is currently engaged in.

62.4 Please explain how the work of the NGIF supports provincial climate objectives.

62.5 Does the NGIF engage in any projects that cannot be directly linked to attainment of the province's climate objectives?

62.5.1 If yes, please describe these projects.

62.6 How did PNG determine that $50,000 per year would be a sufficient level of funding for the NGIF to development of new GHG-reducing technologies?

62.7 Are there any aspects of the work of the NGIF that do not support provincial climate objectives?

63.0 Topic: Comparison of PNG's proposed portfolio with FEI
Reference: Application, Exhibit B-1, p.129, pdf. p.147

In developing this DSM Plan, PNG reviewed DSM programs offered by other Canadian gas utilities as well as the two major BC electricity utilities, BC Hydro and FEI.

63.1 Please provide PNG's comparison of the natural gas programs currently offered by FEI in the province with PNG's proposed 2020-22 portfolio of programs, including the following:

63.1.1 Annual budget, participation, and savings targets by program;

63.1.2 Eligible measures and incentive amounts; and

63.1.3 Program TRC results.

63.2 Are there programs that FEI offers that PNG does not propose to include in its plan? If yes, please explain why, for each program, PNG does not propose to include it.

64.0 Topic: Cost-Effectiveness Results
Reference: Application, Exhibit B-1, , Appendix V: PNG 2017 Conservation Potential Review, pdf. pp. 551 and 552

64.1 Please provide the complete program level cost-effectiveness analysis conducted by PNG for its 2020-22 proposed programs that was used as the basis for the reported values in the individual program tables. (For example, Table 16: Efficient Boilers Program Summary on pdf p. 251 shows a program TRC of 1.61).

64.2 Please provide the complete program level cost-effectiveness analysis conducted by Navigant to develop Table 5.3 on pdf p. 552 in the CPR.

64.3 Please compare the results of PNG's cost-effectiveness analysis and Navigant's analysis and explain any differences.

9. Portfolio Evaluation and Planning

65.0 Topic: Next Consolidated Resource Plan
Reference: Application, Exhibit B-1, pp.134-135, pdf pp.152-153

"9.3 RECAP - Reactivated System Capital and Major Industrials Customer
The RECAP, discussed in Section 7.3.4, could result in the addition of one or more large customers on the PNG-West system within the planning horizon spanned by this Consolidated Resource Plan. Such an outcome will trigger significant capital expenditures to reactivate facilities and pipe to provide the required capacity. PNG will make the appropriate applications to the BCUC for approval of CPCN's should such a growth opportunity arise." [pp.134-135]

65.1 When does PNG intend to prepare and file its next Consolidated Resource Plan?

65.2 In the event that the RECAP results in the addition of one or more large customers on the PNG-West system within the planning horizon of the 2019 CRP, would PNG consider advancing its next CRP?

66.0 Topic: Supply Resource Portfolio
Reference: Application, Exhibit B-1, p.136, pdf p.154

"PNG has developed a supply resource portfolio of gas commodity, storage and pipeline contracts in order to satisfy its gas contracting objectives."

66.1 Is there a method by which the results of PNG's supply resource portfolio and Annual Gas Contracting Plan can be compared with the results achieved by other natural gas distribution utilities, such as FEI? Can PNG comment on how the results of its supply resource portfolio and Annual Gas Contracting Plan compare with those of other natural gas distribution utilities?

67.0 Topic: RNG Supply
Reference: Application, Exhibit B-1, p.139, pdf p.157

"In light of the GGRR voluntary five percent RNG target and the CleanBC 15 percent RNG goal, PNG intends to develop a portfolio of RNG supply. PNG expects that such supply will initially be in the form of biomethane, but that other forms of RNG will also be pursued. PNG expects to acquire RNG, either through entering into supply agreements with third parties, or by developing its own supply projects. PNG anticipates adopting and filing for approval with the BCUC, a similar set of principles governing its ability to develop RNG supply infrastructure, as the BCUC has approved for FEI. <u>PNG expects to begin acquiring RNG supply by late 2020 or 2021</u>. PNG's RNG strategy is described in Section 4.4" [underline added]

67.1 Would it be feasible for PNG to begin acquiring RNG supply sooner than late 2020 or 2021? If not, why not?