Oord, Haydee ENV:EX

From: Dobson, Neil ENV:EX
Sent: Thursday, January 25, 2018 5:35 PM
To: Plecas, Bobbi ENV:EX
Cc: Laaksonen-Craig, Susanna ENV:EX; Lesiuk, Tim ENV:EX
Subject: Slide
Attachments: slide.pptx

Hi Bobbi,

Slide as discussed.

Couple of things to note:
s.12; s.13

Any questions I am around all evening/ tomorrow.

Thanks
Neil

Page 002 of 172 to/à Page 004 of 172

Withheld pursuant to/removed as

s.12; s.13

Page 005 of 172

Withheld pursuant to/removed as

s.13; s.12

Page 006 of 172 to/à Page 009 of 172

Withheld pursuant to/removed as

s.12; s.13

Page 011 of 172 to/à Page 018 of 172

Withheld pursuant to/removed as

s.12; s.13

Oord, Haydee ENV:EX

From: Dobson, Neil ENV:EX
Sent: Friday, February 23, 2018 2:01 PM
To: Laaksonen-Craig, Susanna ENV:EX; Lesiuk, Tim ENV:EX
Cc: Peyman, Hurrian ENV:EX
Subject: LNG forecast deck 23Feb18.pptx
Attachments: LNG forecast deck 23Feb18.pptx

Hi Susanna,

Attached the reworked LNG forecast deck.

Thanks
Neil

Page 020 of 172 to/à Page 022 of 172

Withheld pursuant to/removed as

s.12; s.13

Page 023 of 172

Withheld pursuant to/removed as

s.13; s.12

Page 024 of 172 to/à Page 026 of 172

Withheld pursuant to/removed as

s.12; s.13

Oord, Haydee ENV:EX

From: Dobson, Neil ENV:EX
Sent: Friday, February 23, 2018 10:43 AM
To: Lesiuk, Tim ENV:EX
Subject: FW: LNG forecast deck
Attachments: LNG forecast deck HP.pptx

For discussion at 11. I have not looked at it yet.

From: Peyman, Hurrian ENV:EX
Sent: Thursday, February 22, 2018 6:25 PM
To: Dobson, Neil ENV:EX
Subject: LNG forecast deck

Hi Neil,

Note: I haven't cc'd Susanna and Tim. I thought you might want the first look

Hi,

Attached is the deck.
s.12; s.13

Hurrian

Page 028 of 172 to/à Page 034 of 172

Withheld pursuant to/removed as

s.12; s.13

Oord, Haydee ENV:EX

From: Dobson, Neil ENV:EX
Sent: Tuesday, February 27, 2018 12:33 PM
To: Laaksonen-Craig, Susanna ENV:EX
Cc: Lesiuk, Tim ENV:EX; Peyman, Hurrian ENV:EX
Subject: slide update
Attachments: LNG forecast deck 25Feb18 notes HP.pptx

Hi Susanna, attached the updated slides – I will come round now and walk you through the changes.
Thanks
Neil

Page 036 of 172

Withheld pursuant to/removed as

s.13; s.12

Page 037 of 172 to/à Page 042 of 172

Withheld pursuant to/removed as

s.12; s.13

Oord, Haydee ENV:EX

From: Dobson, Neil ENV:EX
Sent: Tuesday, February 27, 2018 1:29 PM
To: Laaksonen-Craig, Susanna ENV:EX
Cc: Lesiuk, Tim ENV:EX; Peyman, Hurrian ENV:EX
Subject: updated slides
Attachments: LNG forecast deck 25Feb18 notes.pptx

Attached the updated version with the edits discussed. A couple of questions
s.12; s.13

Thanks
Neil

Page 045 of 172 to/à Page 050 of 172

Withheld pursuant to/removed as

s.12; s.13

Oord, Haydee ENV:EX

From: Dobson, Neil ENV:EX
Sent: Tuesday, February 27, 2018 10:48 AM
To: Peyman, Hurrian ENV:EX
Subject: RE: LNG - one more time

Can we build this straight into the slides/notes please or is that not so easy. If we could do this I can take it to Susanna at lunchtime to discuss and finalize

---

From: Peyman, Hurrian ENV:EX
Sent: Tuesday, February 27, 2018 10:46 AM
To: Laaksonen-Craig, Susanna ENV:EX
Cc: Lesiuk, Tim ENV:EX; Dobson, Neil ENV:EX
Subject: RE: LNG - one more time

Hi,

On comparing mining and cement sectors with the oil and gas sectors under current policy, industrial tech fund and 14 MTPA LNG production:

Assumption: to calculate cement emissions, assumed that it comprised 80% of non-metallic minerals emissions (the remainder would be from the lime sector)
Mining includes emissions from metal mining, coal mining, smelting and metal manufacturing

s.12; s.13

s.12; s.13

On additional comments to deck and notes

s.12; s.13

Let me know if you have any questions

Hurrian

From: Laaksonen-Craig, Susanna ENV:EX
Sent: Tuesday, February 27, 2018 10:02 AM
To: Peyman, Hurrian ENV:EX; Dobson, Neil ENV:EX
Cc: Lesiuk, Tim ENV:EX
Subject: RE: LNG - one more time

So, here the deck with all the changes I had time to make this morning. You see that there are a few spots in the notes that require filling in. I am back in my office over lunch if you Neil want to stop by then.

Thanks,
Susanna

Susanna Laaksonen-Craig, PhD
ADM, Climate Action Secretariat
Ministry of Environment and Climate Change Strategy
Phone number: 778 698-4833

From: Peyman, Hurrian ENV:EX
Sent: Tuesday, February 27, 2018 9:33 AM
To: Laaksonen-Craig, Susanna ENV:EX; Dobson, Neil ENV:EX
Cc: Lesiuk, Tim ENV:EX
Subject: RE: LNG - one more time

Whole shebang it is.

For cement, the number will be approximate because “non-metallic minerals also includes lime production)

I also realized that I failed to answer your electrification question. Coming in a few moments.

From: Laaksonen-Craig, Susanna ENV:EX
Sent: Tuesday, February 27, 2018 9:32 AM
To: Peyman, Hurrian ENV:EX; Dobson, Neil ENV:EX
Cc: Lesiuk, Tim ENV:EX
Subject: RE: LNG - one more time

Terrific, thanks! I have now labelled the arrow “Total 14 mtpa production online”. Re: mining, Bobbi says to do the “whole shebang”!

Susanna Laaksonen-Craig, PhD
ADM, Climate Action Secretariat

Ministry of Environment and Climate Change Strategy
Phone number: 778 698-4833

From: Peyman, Hurrian ENV:EX
Sent: Tuesday, February 27, 2018 9:23 AM
To: Laaksonen-Craig, Susanna ENV:EX; Dobson, Neil ENV:EX
Cc: Lesiuk, Tim ENV:EX
Subject: RE: LNG - one more time

Hi,

s.12; s.13

As far as the other two asks (re; mining and cement GHGs), we can come up with a reasonable estimate for GHGs in those two sectors. We will need to closely define what we mean by mining (does it include metal manufacturing and smelting as well?).

Hurrian

From: Laaksonen-Craig, Susanna ENV:EX
Sent: Tuesday, February 27, 2018 9:13 AM
To: Dobson, Neil ENV:EX; Peyman, Hurrian ENV:EX
Cc: Lesiuk, Tim ENV:EX
Subject: LNG - one more time

Hey,

I am making further edits to the LNG deck based on minister's comments last night. I'll send it to you as soon as I am done because the minister would like to know specifically the mining and cement sector emissions so that he could compare those to the LNG ones. I am not sure how doable it is to pull those from the industry bucket so let me know.

The quick one that I can already add to the deck if you send me the info is the LNG Canada start date. What year do we assume in the model the first two trains will start producing?

s.12; s.13

Today's meeting is at 5 so that is the time we are working towards.

Feel free to call me or stop by my office.

Thanks,
Susanna

Susanna Laaksonen-Craig, PhD
ADM, Climate Action Secretariat
Ministry of Environment and Climate Change Strategy

3rd Fl, 525 Superior Street
PO Box 9339 Stn Prov Govt
Victoria, BC V8W 9M1
Phone number: 778 698-4833

Oord, Haydee ENV:EX

From: Dobson, Neil ENV:EX
Sent: Sunday, March 4, 2018 8:34 AM
To: Rhodes, Katya ENV:EX
Cc: Peyman, Hurrian ENV:EX
Subject: FW: Follow up
Attachments: LNG forecast deck 04mar18 notes.pptx

Follow Up Flag: Flag for follow up
Flag Status: Completed

Hi Katya,

I will need you to do some work on the attached slides first thing Monday please – using some existing data and these new runs as outlined below. I will be around so can explain it to you personally as well.

Hurrian is working on the other half of this new ask but can help if needed to get you going in the right direction.

Thanks
Neil

From: Dobson, Neil ENV:EX
Sent: Sunday, March 4, 2018 7:12 AM
To: 'Jotham Peters'
Cc: Peyman, Hurrian ENV:EX; Lesiuk, Tim ENV:EX
Subject: RE: Follow up

Thanks Jotham – some comments embedded in your message below. I'm around all day so feel free to call once you are working on this if you have any questions or find any interesting results as you start working through things.

From: Jotham Peters [mailto:jotham@naviusresearch.com]
Sent: Saturday, March 3, 2018 8:42 PM
To: Dobson, Neil ENV:EX
Cc: Peyman, Hurrian ENV:EX; Lesiuk, Tim ENV:EX
Subject: Re: Follow up

Hi Neil and all,

First of all, I think we can have this done by Monday. I actually want to give you a first draft tomorrow (so its on your desk by Monday morning) so we can do mid-course corrections upon request.

This is a major assumption change (which is a better assumption in my view). So its a good idea to outline the implications of this change. I also explain what we are going to do mechanically,.

Implications of the change

Back in 2015, we made two critical assumptions:

s.12; s.13

If you want more information on the reasons for these implications, please see the next section. But the implication of doing away with assumption 2), but keeping 1) are:

s.12; s.13

What we are actually going to do methodologically

In order to achieve the two requested assumptions from 2015, we made two changes to the model:

s.12; s.13

My proposed method for achieving the revised assumptions is to:

s.12; s.13

Please let me know if you have any questions?

Jotham.

On Sat, Mar 3, 2018 at 12:04 PM, Dobson, Neil ENV:EX <Neil.Dobson@gov.bc.ca> wrote:
Jotham,

Following our call last night can you please run the following:

If not can you please let us know (ideally over the weekend sometime) what you can run so that we can agree and get you started first thing Monday. We only need these in gTech and need results by end of Monday please.

We have the 12mtpa and 0mtpa runs already that we want to compare these too so need all assumptions the same as for those runs from WO 7 so this means we need to use the version of the model used for those runs - ie no recalibration of sectoral level GDP and no change to province level GDP growth assumptions.

s.12; s.13

Thanks a lot
Neil

Neil Dobson
Director, Economics and Analysis | Climate Action Secretariat, Province of British Columbia
M: 250 893-8567<tel:250%20893-8567> |O: 778 698-4064<tel:778%20698-4064>
Email: neil.dobson@gov.bc.ca<mailto:neil.dobson@gov.bc.ca>

--
Jotham Peters, B. Econ, MRM
Navius Research, Inc.
Phone: (604) 683-1255
E-mail: Jotham@NaviusResearch.com

Oord, Haydee ENV:EX

From: Peyman, Hurrian ENV:EX
Sent: Monday, March 5, 2018 3:54 PM
To: Rhodes, Katya ENV:EX; Dobson, Neil ENV:EX
Subject: RE: Slides
Attachments: LNG forecast deck 04mar18 notes_KR HP.pptx

Follow Up Flag: Follow up
Flag Status: Completed

Hi,

s.12; s.13

I can explain how I did the net emission for extreme electrification

---

From: Rhodes, Katya ENV:EX
Sent: Monday, March 5, 2018 3:34 PM
To: Dobson, Neil ENV:EX
Cc: Peyman, Hurrian ENV:EX
Subject: Slides

Hi Neil/Hurrian,

Please review the slides.

Katya

From: Dobson, Neil ENV:EX
Sent: Monday, March 5, 2018 3:15 PM
To: Rhodes, Katya ENV:EX
Cc: Peyman, Hurrian ENV:EX
Subject: Re: Hiccup in the model

Ok, we need these ASAP- what can we do today? Do we have the answers on the 12mtpa different scenarios? Is it just the 0 which is problematic?

Neil

Neil Dobson
Director, Economics and Analysis | Climate Action Secretariat, Province of British Columbia
M: 250 893-8567 |O: 778 698-4064
Email: neil.dobson@gov.bc.ca

On Mar 5, 2018, at 3:09 PM, Rhodes, Katya ENV:EX <Katya.Rhodes@gov.bc.ca> wrote:

s.12; s.13

Katya

From: Peyman, Hurrian ENV:EX
Sent: Monday, March 5, 2018 3:04 PM
To: Dobson, Neil ENV:EX; Rhodes, Katya ENV:EX
Subject: Hiccup in the model

Hi,

s.12; s.13

What is our timeline on this? Can it come in tomorrow morning? Or should we try to move forward with the information that we do have?

Hurrian

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Withheld pursuant to/removed as

s.12; s.13

Oord, Haydee ENV:EX

From: Dobson, Neil ENV:EX
Sent: Monday, March 5, 2018 5:33 PM
To: Plecas, Bobbi ENV:EX; Laaksonen-Craig, Susanna ENV:EX
Cc: Lesiuk, Tim ENV:EX
Subject: slides
Attachments: LNG forecast 180305.3.pptx

Follow Up Flag: Follow up
Flag Status: Completed

Bobbi, Susanna,
Slide edits as discussed. I will be offline now for about 40 minutes while I go and pick up Matthew but am available this evening to make edits so feel free to call/ email.
Thanks
Neil

Page 065 of 172 to/à Page 067 of 172

Withheld pursuant to/removed as

s.12; s.13

Oord, Haydee ENV:EX

From: Peyman, Hurrian ENV:EX
Sent: Tuesday, March 6, 2018 6:44 PM
To: Dobson, Neil ENV:EX
Subject: offsetting LNG Canada emissions

Hi,

What we want to know is how will BC's GHG emissions really change if we put in LNG Canada.

s.12; s.13

Call me if you want to discuss

Hurrian

Oord, Haydee ENV:EX

From: Lesiuk, Tim ENV:EX
Sent: Tuesday, March 6, 2018 10:54 AM
To: Peyman, Hurrian ENV:EX
Cc: Dobson, Neil ENV:EX
Subject: RE: answer
Attachments: gas supply summary.xlsx

Hi Hurrian. Table as discussed

tim

Tim Lesiuk
Executive Director, Business Development and Chief Negotiator
Climate Action Secretariat, Province of British Columbia
Mobile: 250.216.5893
Email: tim.lesiuk@gov.bc.ca

From: Dobson, Neil ENV:EX
Sent: Monday, March 5, 2018 10:09 PM
To: Lesiuk, Tim ENV:EX
Subject: answer

s.12; s.13

Thanks
Neil

Neil Dobson
Director, Economics and Analysis | Climate Action Secretariat, Province of British Columbia
M: 250 893-8567 |O: 778 698-4064
Email: neil.dobson@gov.bc.ca

	BC production	non-BC production
Incremental supply		
LNG Canada		
BC consumers		
BC export to NA		
total		
Variable supply		
LNG Canada		
BC consumers		
BC export to NA		
total		

Oord, Haydee ENV:EX

From: Lesiuk, Tim ENV:EX
Sent: Wednesday, March 7, 2018 6:34 AM
To: Laaksonen-Craig, Susanna ENV:EX; Plecas, Bobbi ENV:EX; Piccinino, Ines MNGD:EX
Cc: Dobson, Neil ENV:EX
Subject: Fwd: slides
Attachments: LNG forecast 180306.7.pptx; ATT00001.htm

s.12; s.13

Tim

Tim Lesiuk
Executive Director, Business Development and Chief Negotiator
Climate Action Secretariat, Province of British Columbia
Mobile: 250.216.5893
Email: tim.lesiuk@gov.bc.ca

Begin forwarded message:

> **From:** "Dobson, Neil ENV:EX" <Neil.Dobson@gov.bc.ca>
> **Date:** March 6, 2018 at 11:13:12 PM PST
> **To:** "Lesiuk, Tim ENV:EX" <Tim.Lesiuk@gov.bc.ca>
> **Cc:** "Peyman, Hurrian ENV:EX" <Hurrian.Peyman@gov.bc.ca>
> **Subject: slides**
>
> Tim,
>
> Attached the first deck. I have made the proposed changes to the table and also adjusted the notes in #2 to explain how the bottom line is calculated and taken the piece about other resource emissions to a new bullet at the bottom and expanded on it a little.
> I have also added some notes to #3 to explain why the gap between the lines is different to the numbers on the previous charts.
>
> I have a docs appointment at 9 so will be in around 10, but am available by email or phone pre-9 or Hurrian will likely be around.
>
> Thanks
> Neil
>
> Neil Dobson
> Director, Economics and Analysis | Climate Action Secretariat, Province of British Columbia
> M: 250 893-8567 |O: 778 698-4064

Email: neil.dobson@gov.bc.ca

Page 074 of 172 to/à Page 076 of 172

Withheld pursuant to/removed as

s.12; s.13

Oord, Haydee ENV:EX

From: Lesiuk, Tim ENV:EX
Sent: Thursday, March 8, 2018 4:20 PM
To: Laaksonen-Craig, Susanna ENV:EX
Subject: FW: slides
Attachments: LNG forecast 180306.7.pptx; ATT00001.htm

Categories: ACTION

Tim Lesiuk
Executive Director, Business Development and Chief Negotiator
Climate Action Secretariat, Province of British Columbia
Mobile: 250.216.5893
Email: tim.lesiuk@gov.bc.ca

From: Lesiuk, Tim ENV:EX
Sent: Wednesday, March 7, 2018 6:34 AM
To: Laaksonen-Craig, Susanna ENV:EX; Plecas, Bobbi ENV:EX; Piccinino, Ines MNGD:EX
Cc: Dobson, Neil ENV:EX
Subject: Fwd: slides

s.12; s.13

Tim

Tim Lesiuk
Executive Director, Business Development and Chief Negotiator
Climate Action Secretariat, Province of British Columbia
Mobile: 250.216.5893
Email: tim.lesiuk@gov.bc.ca

Begin forwarded message:

> **From:** "Dobson, Neil ENV:EX" <Neil.Dobson@gov.bc.ca>
> **Date:** March 6, 2018 at 11:13:12 PM PST
> **To:** "Lesiuk, Tim ENV:EX" <Tim.Lesiuk@gov.bc.ca>
> **Cc:** "Peyman, Hurrian ENV:EX" <Hurrian.Peyman@gov.bc.ca>
> **Subject: slides**
>
> Tim,

Attached the first deck. I have made the proposed changes to the table and also adjusted the notes in #2 to explain how the bottom line is calculated and taken the piece about other resource emissions to a new bullet at the bottom and expanded on it a little.
I have also added some notes to #3 to explain why the gap between the lines is different to the numbers on the previous charts.

I have a docs appointment at 9 so will be in around 10, but am available by email or phone pre-9 or Hurrian will likely be around.

Thanks
Neil

Neil Dobson
Director, Economics and Analysis | Climate Action Secretariat, Province of British Columbia
M: 250 893-8567 |O: 778 698-4064
Email: neil.dobson@gov.bc.ca

Page 080 of 172 to/à Page 081 of 172

Withheld pursuant to/removed as

s.12; s.13

Page 082 of 172 to/à Page 084 of 172

Withheld pursuant to/removed as

s.13; s.14

Oord, Haydee ENV:EX

From: Peyman, Hurrian ENV:EX
Sent: Wednesday, March 21, 2018 12:21 PM
To: Plecas, Bobbi ENV:EX
Cc: Dobson, Neil ENV:EX; Lesiuk, Tim ENV:EX; Laaksonen-Craig, Susanna ENV:EX; Fradley, Adria N ENV:EX
Subject: RE: Climate effects of LNG Canada
Attachments: Climate effects of LNG Canada.docx

Hi,

I just spoke with Susanna and we decided to include one more question.

Let me know if you have any questions.

Hurrian

From: Peyman, Hurrian ENV:EX
Sent: Wednesday, March 21, 2018 9:30 AM
To: Plecas, Bobbi ENV:EX
Cc: Dobson, Neil ENV:EX; Lesiuk, Tim ENV:EX; Laaksonen-Craig, Susanna ENV:EX; Fradley, Adria N ENV:EX
Subject: Climate effects of LNG Canada

Hi,

As requested, please find attached a summary of the climate effects of LNG Canada in Q&A format. Please let me know if you have any feedback/revisions.

One caveat:
s.12; s.13

Once again, let me know if you want to see any edits. If other questions come up on this, I'm reachable at s.22 or s.22

Hurrian

Climate effects of LNG Canada

What are BC's current upstream oil and gas sector greenhouse gas emissions?

- In 2015, oil and gas sector upstream greenhouse gas (GHG) emissions were 11.5 million tonnes of carbon dioxide equivalent (Mt CO_2e)
- The large majority of these GHGs were from gas wells, batteries and processing plants (10.7 Mt CO2e) with the remainder coming from natural gas transmission (0.24 Mt CO2e) and oil refineries (0.58 Mt CO2e)
- Of these emissions, 6.8 Mt CO2e were from combustion, 0.6 Mt CO2e from flaring, 3.0 Mt CO2e from carbon dioxide and methane venting, 0.8 Mt CO2e from fugitives (methane leaks) and 0.2 Mt CO2e from process emissions

What are the upstream oil and gas sector GHGs expected to be in 2030 in the absence of LNG development?

- Modelling indicates that upstream emissions would be approximately 13.4 Mt CO2e in 2030. These would be from upstream oil and gas production (10 Mt CO2e), natural gas transmission (1.6 Mt CO2e) and oil refining (1.8 Mt CO2e).
- This increase in emissions in 2030 is largely due to higher forecasted natural gas production (31% above 2015 levels)
- Of these GHG emissions, approximately 9.8 Mt CO2e are from combustion, 2.0 Mt CO2e are from CO2 venting, 1.1 Mt CO2e are from methane venting and fugitives, 0.7 Mt CO2e are from process emissions

What are the expected emissions of the LNG Canada facility? How does its emissions intensity compare with other global LNG facilities?

- The first two production units ("trains") of LNG Canada will produce approximately 12 Mt of LNG at an emission intensity of 0.15 tonnes carbon dioxide equivalent for each tonne of LNG produced for total emissions of 1.8 Mt CO2e.
- According to independent research on leading LNG facilities, LNG Canada will have the lowest emissions intensity of any LNG export facility in the world.

What are the related upstream emissions from that facility

- The extraction, processing and transmission emissions associated with the LNG production would be approximately 2.27 Mt CO2e.

- This assumes that 75% of the feedstock gas would come from BC. (GHG emissions that occur in other jurisdictions to extract, process and transmit the feedstock gas are not included within BC's emissions inventory.)
- It is estimated that 25% of the gas production and processing for the LNG Canada plant would be electrified.

Is there any way to further mitigate the emissions that remain?

- Aggressive electrification could bring upstream emissions as low as 0.97 Mt CO2e.
- This would likely require electrification of all new extraction and processing wells (at a cost of about $25-75 for each tonne of CO2e reduced).
- In addition, some existing facilities would also need to be electrified (at a cost or $130-180 per tonne reduced.)

So, if facility emissions are 1.8 Mt CO2e and upstream (without aggressive electrification) are 2.27 Mt CO2e, is it fair to say that BC's emissions will be 4 Mt higher with an LNG facility?

- No. Modelling has shown that when BC produces natural gas for LNG production, it is offset by reductions in gas produced for other purposes, like pipeline export.
- Of the 1.5 billion cubic feet/day required to supply LNG Canada, only 20% of this comes from new production; the remainder is from gas diverted from pipeline exports or increased imports.
- Modelling has suggested that upstream emissions under LNG Canada would only increase by 0.3 Mt CO2e over a scenario where no LNG is produced

What are the downstream emissions (end use combustion) from the LNG from LNG Canada?

- End use GHG emissions depend on the efficiency of the power plant that is converting the LNG into electricity or heat. One meta-study found that each tonne of LNG would have approximately 2.66 tonnes CO2e emissions from end use combustion.
- If this LNG is displacing higher emission fuels like diesel or coal, there could be significant global lifecycle emission reductions from LNG Canada's exports.
- A recent study by the University of Calgary and M.I.T. determined that, pro-rated, 12 Mt of BC LNG (i.e. LNG Canada's output) would lead to 16 to 34 global lifecycle GHG emission reductions.

Oord, Haydee ENV:EX

From: Peyman, Hurrian ENV:EX
Sent: Wednesday, March 21, 2018 12:21 PM
To: Plecas, Bobbi ENV:EX
Cc: Dobson, Neil ENV:EX; Lesiuk, Tim ENV:EX; Laaksonen-Craig, Susanna ENV:EX; Fradley, Adria N ENV:EX
Subject: RE: Climate effects of LNG Canada
Attachments: Climate effects of LNG Canada.docx

Hi,

I just spoke with Susanna and we decided to include one more question.

Let me know if you have any questions.

Hurrian

From: Peyman, Hurrian ENV:EX
Sent: Wednesday, March 21, 2018 9:30 AM
To: Plecas, Bobbi ENV:EX
Cc: Dobson, Neil ENV:EX; Lesiuk, Tim ENV:EX; Laaksonen-Craig, Susanna ENV:EX; Fradley, Adria N ENV:EX
Subject: Climate effects of LNG Canada

Hi,

As requested, please find attached a summary of the climate effects of LNG Canada in Q&A format. Please let me know if you have any feedback/revisions.

One caveat:
s.12; s.13

Once again, let me know if you want to see any edits. If other questions come up on this, I'm reachable at s.22 or s.22

Hurrian

Climate effects of LNG Canada

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- In 2015, oil and gas sector upstream greenhouse gas (GHG) emissions were 11.5 million tonnes of carbon dioxide equivalent (Mt CO_2e)
- The large majority of these GHGs were from gas wells, batteries and processing plants (10.7 Mt CO2e) with the remainder coming from natural gas transmission (0.24 Mt CO2e) and oil refineries (0.58 Mt CO2e)
- Of these emissions, 6.8 Mt CO2e were from combustion, 0.6 Mt CO2e from flaring, 3.0 Mt CO2e from carbon dioxide and methane venting, 0.8 Mt CO2e from fugitives (methane leaks) and 0.2 Mt CO2e from process emissions

What are the upstream oil and gas sector GHGs expected to be in 2030 in the absence of LNG development?

- Modelling indicates that upstream emissions would be approximately 13.4 Mt CO2e in 2030. These would be from upstream oil and gas production (10 Mt CO2e), natural gas transmission (1.6 Mt CO2e) and oil refining (1.8 Mt CO2e).
- This increase in emissions in 2030 is largely due to higher forecasted natural gas production (31% above 2015 levels)
- Of these GHG emissions, approximately 9.8 Mt CO2e are from combustion, 2.0 Mt CO2e are from CO2 venting, 1.1 Mt CO2e are from methane venting and fugitives, 0.7 Mt CO2e are from process emissions

What are the expected emissions of the LNG Canada facility? How does its emissions intensity compare with other global LNG facilities?

- The first two production units ("trains") of LNG Canada will produce approximately 12 Mt of LNG at an emission intensity of 0.15 tonnes carbon dioxide equivalent for each tonne of LNG produced for total emissions of 1.8 Mt CO2e.
- According to independent research on leading LNG facilities, LNG Canada will have the lowest emissions intensity of any LNG export facility in the world.

What are the related upstream emissions from that facility

- The extraction, processing and transmission emissions associated with the LNG production would be approximately 2.27 Mt CO2e.

- This assumes that 75% of the feedstock gas would come from BC. (GHG emissions that occur in other jurisdictions to extract, process and transmit the feedstock gas are not included within BC's emissions inventory.)
- It is estimated that 25% of the gas production and processing for the LNG Canada plant would be electrified.

Is there any way to further mitigate the emissions that remain?

- Aggressive electrification could bring upstream emissions as low as 0.97 Mt CO2e.
- This would likely require electrification of all new extraction and processing wells (at a cost of about $25-75 for each tonne of CO2e reduced).
- In addition, some existing facilities would also need to be electrified (at a cost or $130-180 per tonne reduced.)

So, if facility emissions are 1.8 Mt CO2e and upstream (without aggressive electrification) are 2.27 Mt CO2e, is it fair to say that BC's emissions will be 4 Mt higher with an LNG facility?

- No. Modelling has shown that when BC produces natural gas for LNG production, it is offset by reductions in gas produced for other purposes, like pipeline export.
- Of the 1.5 billion cubic feet/day required to supply LNG Canada, only 20% of this comes from new production; the remainder is from gas diverted from pipeline exports or increased imports.
- Modelling has suggested that upstream emissions under LNG Canada would only increase by 0.3 Mt CO2e over a scenario where no LNG is produced

What are the downstream emissions (end use combustion) from the LNG from LNG Canada?

- End use GHG emissions depend on the efficiency of the power plant that is converting the LNG into electricity or heat. One meta-study found that each tonne of LNG would have approximately 2.66 tonnes CO2e emissions from end use combustion.
- If this LNG is displacing higher emission fuels like diesel or coal, there could be significant global lifecycle emission reductions from LNG Canada's exports.
- A recent study by the University of Calgary and M.I.T. determined that, pro-rated, 12 Mt of BC LNG (i.e. LNG Canada's output) would lead to 16 to 34 global lifecycle GHG emission reductions.

Oord, Haydee ENV:EX

From: Sanford, Donna L GCPE:EX
Sent: Wednesday, March 21, 2018 4:25 PM
To: Plecas, Bobbi ENV:EX
Subject: FW: GHG Numbers
Attachments: LNG Canada GHG emissions with CAS projections.xlsx

Hello Bobbi. Please see below. I'm passing this on at Liz's request.
Regards,
Donna

From: Lilly, Liz [mailto:Liz.Lilly@leg.bc.ca]
Sent: Monday, March 19, 2018 12:19 PM
To: Sanford, Donna L GCPE:EX
Cc: Hume, Claire LASS:EX; Weaver, Andrew; Pivnick, Evan V LASS:EX
Subject: GHG Numbers

Hi Donna,

I realised that I had used a one third reduction by 2030 in the previous version of these numbers, when the plan is to move to 40% by 2030, so I have revised the numbers to show this. I have also included spreadsheets that incorporate the assumptions that were presented to us last week.

This change increases the reductions we must make to 2030 on an annual basis compared to those after 2030, to meet the 2050 target.

Without LNG Canada, we must reduce by an average of 1.76 $MtCO_2e$ to 2030 and 1.29 $MtCO_2e$ per year from 2031 to 2050 to meet our targets.

Under the most optimistic emissions scenario, we would have to reduce emissions by over 4$MtCO_2e$ per year if LNG Canada goes ahead. Which is equivalent to taking something like 800,000 cars per year off the road (Pembina: 1.9 million cars equals 9.2 $MtCO_2e$ http://www.pembina.org/pub/pnwlng)

I have assumed that GHG emissions have been flat since the last numbers were published in 2015.

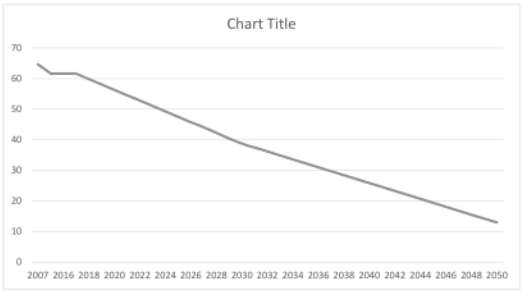
Please feel free to pass this to Bobbi.

Liz

Base

		Yr on Yr total emission reductions required w/o LNG
2007	64.7	
2015	61.6	
2016	61.6	
2017	61.6	
2018	59.84	-1.76
2019	58.08	-1.76
2020	56.32	-1.76
2021	54.56	-1.76
2022	52.8	-1.76
2023	51.04	-1.76
2024	49.28	-1.76
2025	47.52	-1.76
2026	45.76	-1.76
2027	44	-1.76
2028	42.24	-1.76
2029	40.48	-1.76
2030	38.72	-1.29
2031	37.43	-1.29
2032	36.14	-1.29
2033	34.85	-1.29
2034	33.56	-1.29
2035	32.27	-1.29
2036	30.98	-1.29
2037	29.69	-1.29
2038	28.4	-1.29
2039	27.11	-1.29
2040	25.82	-1.29
2041	24.53	-1.29
2042	23.24	-1.29
2043	21.95	-1.29
2044	20.66	-1.29
2045	19.37	-1.29
2046	18.08	-1.29
2047	16.79	-1.29
2048	15.5	-1.29
2049	14.21	-1.29
2050	12.92	

Carbon Budget 1144.14



Base

			LNG Plant	Upstream	Total		LNG as a% of total allowable emissions	Total emissions with LNG	Yr on Yr total emission reductions required w/o LNG	Total yr on yr reduction required
yrs	1 to 5		2	2						
yrs	6 to 25		4	4						
	2007	64.7								
	2015	61.6								
	2016	61.6								
	2017	61.6								
	2018	59.84							-1.76	
	2019	58.08							-1.76	
	2020	56.32							-1.76	
	2021	54.56							-1.76	
	2022	52.8							-1.76	
	2023	51.04							-1.76	
	2024	49.28							-1.76	
	2025	47.52	2	2	4	8%	51.52	-1.76	-5.76	
	2026	45.76	2	2	4	9%	49.76	-1.76	-5.76	
	2027	44	2	2	4	9%	48	-1.76	-5.76	
	2028	42.24	2	2	4	9%	46.24	-1.76	-5.76	
	2029	40.48	2	2	4	10%	44.48	-1.76	-5.76	
	2030	38.72	4	4	8	21%	46.72	-1.29	-9.29	
	2031	37.43	4	4	8	21%	45.43	-1.29	-9.29	
	2032	36.14	4	4	8	22%	44.14	-1.29	-9.29	
	2033	34.85	4	4	8	23%	42.85	-1.29	-9.29	
	2034	33.56	4	4	8	24%	41.56	-1.29	-9.29	
	2035	32.27	4	4	8	25%	40.27	-1.29	-9.29	
	2036	30.98	4	4	8	26%	38.98	-1.29	-9.29	
	2037	29.69	4	4	8	27%	37.69	-1.29	-9.29	
	2038	28.4	4	4	8	28%	36.4	-1.29	-9.29	
	2039	27.11	4	4	8	30%	35.11	-1.29	-9.29	
	2040	25.82	4	4	8	31%	33.82	-1.29	-9.29	
	2041	24.53	4	4	8	33%	32.53	-1.29	-9.29	
	2042	23.24	4	4	8	34%	31.24	-1.29	-9.29	
	2043	21.95	4	4	8	36%	29.95	-1.29	-9.29	
	2044	20.66	4	4	8	39%	28.66	-1.29	-9.29	
	2045	19.37	4	4	8	41%	27.37	-1.29	-9.29	
	2046	18.08	4	4	8	44%	26.08	-1.29	-9.29	
	2047	16.79	4	4	8	48%	24.79	-1.29	-9.29	
	2048	15.5	4	4	8	52%	23.5	-1.29	-9.29	
	2049	14.21	4	4	8	56%	22.21	-1.29	-9.29	
	2050	12.92	4	4	8	62%				
Carbon Budget		1144.14			188	16%				

The Base Scenario assumes GHG emissions from LNG Canada facility as per the information submitted to the Environmental Assessment Process, plus upsteam emissions based on "British Columbia LNG Greenhouse Gas (GHG) Life Cycle Analysis" by Globe Advisors

Pembina

			LNG Plant	Upstream	Total	LNG as a% of total allowable emissions	Total emissions with LNG	Yr on Yr total emission reductions required w/o LNG	Total yr on yr reduction required
yrs	1 to 5		3.6	5					
yrs	6 to 25		3.6	6					
	2007	64.7							
	2015	61.6							
	2016	61.6							
	2017	61.6							
	2018	59.84						-1.76	
	2019	58.08						-1.76	
	2020	56.32						-1.76	
	2021	54.56						-1.76	
	2022	52.8						-1.76	
	2023	51.04						-1.76	
	2024	49.28						-1.76	
	2025	47.52	3.6	5	8.6	18%	56.12	-1.76	-10.36
	2026	45.76	3.6	5	8.6	19%	54.36	-1.76	-10.36
	2027	44	3.6	5	8.6	20%	52.6	-1.76	-10.36
	2028	42.24	3.6	5	8.6	20%	50.84	-1.76	-10.36
	2029	40.48	3.6	5	8.6	21%	49.08	-1.76	-10.36
	2030	38.72	3.6	6	9.6	25%	48.32	-1.29	-10.89
	2031	37.43	3.6	6	9.6	26%	47.03	-1.29	-10.89
	2032	36.14	3.6	6	9.6	27%	45.74	-1.29	-10.89
	2033	34.85	3.6	6	9.6	28%	44.45	-1.29	-10.89
	2034	33.56	3.6	6	9.6	29%	43.16	-1.29	-10.89
	2035	32.27	3.6	6	9.6	30%	41.87	-1.29	-10.89
	2036	30.98	3.6	6	9.6	31%	40.58	-1.29	-10.89
	2037	29.69	3.6	6	9.6	32%	39.29	-1.29	-10.89
	2038	28.4	3.6	6	9.6	34%	38	-1.29	-10.89
	2039	27.11	3.6	6	9.6	35%	36.71	-1.29	-10.89
	2040	25.82	3.6	6	9.6	37%	35.42	-1.29	-10.89
	2041	24.53	3.6	6	9.6	39%	34.13	-1.29	-10.89
	2042	23.24	3.6	6	9.6	41%	32.84	-1.29	-10.89
	2043	21.95	3.6	6	9.6	44%	31.55	-1.29	-10.89
	2044	20.66	3.6	6	9.6	46%	30.26	-1.29	-10.89
	2045	19.37	3.6	6	9.6	50%	28.97	-1.29	-10.89
	2046	18.08	3.6	6	9.6	53%	27.68	-1.29	-10.89
	2047	16.79	3.6	6	9.6	57%	26.39	-1.29	-10.89
	2048	15.5	3.6	6	9.6	62%	25.1	-1.29	-10.89
	2049	14.21	3.6	6	9.6	68%	23.81	-1.29	-10.89
	2050	12.92	3.6	6	9.6	74%			
Carbon Budget		1144.14			244.6	21%			

Uses LNG Numbers from "Liquefied natural gas, carbon pollution and British Columbia in 2017" Pembina Institute.

Electrification

			LNG Plant	Upstream	Total	LNG as a% of total allowable emissions	Total emissions with LNG	Yr on Yr total emission reductions required w/o LNG	Total yr on yr reduction required
yrs	1 to 5		1.8	2.5					
yrs	6 to 25		1.8	2.5					
2007		64.7							
2015		61.6							
2016		61.6							
2017		61.6							
2018		59.84						-1.76	
2019		58.08						-1.76	
2020		56.32						-1.76	
2021		54.56						-1.76	
2022		52.8						-1.76	
2023		51.04						-1.76	
2024		49.28						-1.76	
2025		47.52	1.8	2.5	4.3	9%	51.82	-1.76	-6.06
2026		45.76	1.8	2.5	4.3	9%	50.06	-1.76	-6.06
2027		44	1.8	2.5	4.3	10%	48.3	-1.76	-6.06
2028		42.24	1.8	2.5	4.3	10%	46.54	-1.76	-6.06
2029		40.48	1.8	2.5	4.3	11%	44.78	-1.76	-6.06
2030		38.72	1.8	2.5	4.3	11%	43.02	-1.29	-5.59
2031		37.43	1.8	2.5	4.3	11%	41.73	-1.29	-5.59
2032		36.14	1.8	2.5	4.3	12%	40.44	-1.29	-5.59
2033		34.85	1.8	2.5	4.3	12%	39.15	-1.29	-5.59
2034		33.56	1.8	2.5	4.3	13%	37.86	-1.29	-5.59
2035		32.27	1.8	2.5	4.3	13%	36.57	-1.29	-5.59
2036		30.98	1.8	2.5	4.3	14%	35.28	-1.29	-5.59
2037		29.69	1.8	2.5	4.3	14%	33.99	-1.29	-5.59
2038		28.4	1.8	2.5	4.3	15%	32.7	-1.29	-5.59
2039		27.11	1.8	2.5	4.3	16%	31.41	-1.29	-5.59
2040		25.82	1.8	2.5	4.3	17%	30.12	-1.29	-5.59
2041		24.53	1.8	2.5	4.3	18%	28.83	-1.29	-5.59
2042		23.24	1.8	2.5	4.3	19%	27.54	-1.29	-5.59
2043		21.95	1.8	2.5	4.3	20%	26.25	-1.29	-5.59
2044		20.66	1.8	2.5	4.3	21%	24.96	-1.29	-5.59
2045		19.37	1.8	2.5	4.3	22%	23.67	-1.29	-5.59
2046		18.08	1.8	2.5	4.3	24%	22.38	-1.29	-5.59
2047		16.79	1.8	2.5	4.3	26%	21.09	-1.29	-5.59
2048		15.5	1.8	2.5	4.3	28%	19.8	-1.29	-5.59
2049		14.21	1.8	2.5	4.3	30%	18.51	-1.29	-5.59
2050		12.92	1.8	2.5	4.3	33%			
Carbon Budget		1144.14			111.8	10%			

Uses electrification scenario from "Liquefied natural gas, carbon pollution and British Columbia in 2017" Pembina Institute

2 TRAINS, Base Case

			LNG Plant	Upstream	Total	LNG as a% of total allowable emissions	Total emissions with LNG	Yr on Yr total emission reductions required w/o LNG	Total yr on yr reduction required
yrs	1 to 5		1.8	2.27					
yrs	6 to 25		1.8	2.27					
	2007	64.7							
	2015	61.6							
	2016	61.6							
	2017	61.6							
	2018	59.84						-1.76	
	2019	58.08						-1.76	
	2020	56.32						-1.76	
	2021	54.56						-1.76	
	2022	52.8						-1.76	
	2023	51.04						-1.76	
	2024	49.28						-1.76	
	2025	47.52	1.8	2.27	4.07	9%	51.59	-1.76	-5.83
	2026	45.76	1.8	2.27	4.07	9%	49.83	-1.76	-5.83
	2027	44	1.8	2.27	4.07	9%	48.07	-1.76	-5.83
	2028	42.24	1.8	2.27	4.07	10%	46.31	-1.76	-5.83
	2029	40.48	1.8	2.27	4.07	10%	44.55	-1.76	-5.83
	2030	38.72	1.8	2.27	4.07	11%	42.79	-1.29	-5.36
	2031	37.43	1.8	2.27	4.07	11%	41.5	-1.29	-5.36
	2032	36.14	1.8	2.27	4.07	11%	40.21	-1.29	-5.36
	2033	34.85	1.8	2.27	4.07	12%	38.92	-1.29	-5.36
	2034	33.56	1.8	2.27	4.07	12%	37.63	-1.29	-5.36
	2035	32.27	1.8	2.27	4.07	13%	36.34	-1.29	-5.36
	2036	30.98	1.8	2.27	4.07	13%	35.05	-1.29	-5.36
	2037	29.69	1.8	2.27	4.07	14%	33.76	-1.29	-5.36
	2038	28.4	1.8	2.27	4.07	14%	32.47	-1.29	-5.36
	2039	27.11	1.8	2.27	4.07	15%	31.18	-1.29	-5.36
	2040	25.82	1.8	2.27	4.07	16%	29.89	-1.29	-5.36
	2041	24.53	1.8	2.27	4.07	17%	28.6	-1.29	-5.36
	2042	23.24	1.8	2.27	4.07	18%	27.31	-1.29	-5.36
	2043	21.95	1.8	2.27	4.07	19%	26.02	-1.29	-5.36
	2044	20.66	1.8	2.27	4.07	20%	24.73	-1.29	-5.36
	2045	19.37	1.8	2.27	4.07	21%	23.44	-1.29	-5.36
	2046	18.08	1.8	2.27	4.07	23%	22.15	-1.29	-5.36
	2047	16.79	1.8	2.27	4.07	24%	20.86	-1.29	-5.36
	2048	15.5	1.8	2.27	4.07	26%	19.57	-1.29	-5.36
	2049	14.21	1.8	2.27	4.07	29%	18.28	-1.29	-5.36
	2050	12.92	1.8	2.27	4.07	32%			
Carbon Budget		1144.14			105.82	9%			

Uses electrification scenario from "Liquefied natural gas, carbon pollution and British Columbia in 2017" Pembina Institute

2 TRAINS, Aggressive upstream electrification

			LNG Plant	Upstream	Total	LNG as a% of total allowable emissions	Total emissions with LNG	Yr on Yr total emission reductions required w/o LNG	Total yr on yr reduction required
yrs	1 to 5		1.8	0.97					
yrs	6 to 25		1.8	0.97					
2007		64.7							
2015		61.6							
2016		61.6							
2017		61.6							
2018		59.84						-1.76	
2019		58.08						-1.76	
2020		56.32						-1.76	
2021		54.56						-1.76	
2022		52.8						-1.76	
2023		51.04						-1.76	
2024		49.28						-1.76	
2025		47.52	1.8	0.97	2.77	6%	50.29	-1.76	-4.53
2026		45.76	1.8	0.97	2.77	6%	48.53	-1.76	-4.53
2027		44	1.8	0.97	2.77	6%	46.77	-1.76	-4.53
2028		42.24	1.8	0.97	2.77	7%	45.01	-1.76	-4.53
2029		40.48	1.8	0.97	2.77	7%	43.25	-1.76	-4.53
2030		38.72	1.8	0.97	2.77	7%	41.49	-1.29	-4.06
2031		37.43	1.8	0.97	2.77	7%	40.2	-1.29	-4.06
2032		36.14	1.8	0.97	2.77	8%	38.91	-1.29	-4.06
2033		34.85	1.8	0.97	2.77	8%	37.62	-1.29	-4.06
2034		33.56	1.8	0.97	2.77	8%	36.33	-1.29	-4.06
2035		32.27	1.8	0.97	2.77	9%	35.04	-1.29	-4.06
2036		30.98	1.8	0.97	2.77	9%	33.75	-1.29	-4.06
2037		29.69	1.8	0.97	2.77	9%	32.46	-1.29	-4.06
2038		28.4	1.8	0.97	2.77	10%	31.17	-1.29	-4.06
2039		27.11	1.8	0.97	2.77	10%	29.88	-1.29	-4.06
2040		25.82	1.8	0.97	2.77	11%	28.59	-1.29	-4.06
2041		24.53	1.8	0.97	2.77	11%	27.3	-1.29	-4.06
2042		23.24	1.8	0.97	2.77	12%	26.01	-1.29	-4.06
2043		21.95	1.8	0.97	2.77	13%	24.72	-1.29	-4.06
2044		20.66	1.8	0.97	2.77	13%	23.43	-1.29	-4.06
2045		19.37	1.8	0.97	2.77	14%	22.14	-1.29	-4.06
2046		18.08	1.8	0.97	2.77	15%	20.85	-1.29	-4.06
2047		16.79	1.8	0.97	2.77	16%	19.56	-1.29	-4.06
2048		15.5	1.8	0.97	2.77	18%	18.27	-1.29	-4.06
2049		14.21	1.8	0.97	2.77	19%	16.98	-1.29	-4.06
2050		12.92	1.8	0.97	2.77	21%			
Carbon Budget		1144.14			72.02	6%			

Uses electrification scenario from "Liquefied natural gas, carbon pollution and British Columbia in 2017" Pembina Institute

Oord, Haydee ENV:EX

From: Karn, David GCPE:EX
Sent: Thursday, March 22, 2018 3:55 PM
To: Peyman, Hurrian ENV:EX
Subject: FW: media request - DeSmog - LNG Canada emissions

- page 61 of the LNG Canada EA application: https://www.ceaa-acee.gc.ca/050/documents/p80038/101852E.pdf

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From: Karn, David GCPE:EX
Sent: Thursday, March 22, 2018 2:52 PM
To: Plecas, Bobbi ENV:EX
Cc: Crebo, David GCPE:EX; Duncan, Laurie ENV:EX; Cameron, Tara D ENV:EX
Subject: media request - DeSmog - LNG Canada emissions

Bobbi,

I don't have this answer in the Q/As.

Reporter
Carol Linnitt, Editor
DeSmog Canada
carol@desmog.ca
250-858-1329

Deadline ASAP

Request
Here in the press gallery we're all wondering how government came to the estimation that LNG Canada will emit 4mt of co2 emissions.

Do you have any backgrounder documents on that?

At the press conference Weaver held, he used an 8-10 mt estimate, which I think comes from this Pembina report: http://www.pembina.org/reports/lng-carbon-pollution-bc-2017.pdf?utm_source=Media&utm_campaign=a6e42522ee-PR%3AGasPriceLNG_2018_03_22&utm_medium=email&utm_term=0_c104a55271-a6e42522ee-84986629

Recommendation

Oord, Haydee ENV:EX

From: Peyman, Hurrian ENV:EX
Sent: Thursday, March 22, 2018 4:35 PM
To: Karn, David GCPE:EX
Cc: Plecas, Bobbi ENV:EX; Lesiuk, Tim ENV:EX; Laaksonen-Craig, Susanna ENV:EX; Fradley, Adria N ENV:EX
Subject: RE: media request - DeSmog - LNG Canada emissions

This is my proposed response. I will be reachable by phone at s.22 if there are further questons

Hi,

s.13

Please don't hesitate to contact me if there are any questions.

From: Karn, David GCPE:EX
Sent: Thursday, March 22, 2018 3:55 PM
To: Peyman, Hurrian ENV:EX
Subject: FW: media request - DeSmog - LNG Canada emissions

- page 61 of the LNG Canada EA application: https://www.ceaa-acee.gc.ca/050/documents/p80038/101852E.pdf

---

From: Karn, David GCPE:EX
Sent: Thursday, March 22, 2018 2:52 PM
To: Plecas, Bobbi ENV:EX
Cc: Crebo, David GCPE:EX; Duncan, Laurie ENV:EX; Cameron, Tara D ENV:EX
Subject: media request - DeSmog - LNG Canada emissions

Bobbi,

I don't have this answer in the Q/As.

Reporter
Carol Linnitt, Editor
DeSmog Canada
carol@desmog.ca
250-858-1329

Deadline ASAP

Request
Here in the press gallery we're all wondering how government came to the estimation that LNG Canada will emit 4mt of co2 emissions.

Do you have any backgrounder documents on that?

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Recommendation

Oord, Haydee ENV:EX

From: Karn, David GCPE:EX
Sent: Thursday, March 22, 2018 4:46 PM
To: Peyman, Hurrian ENV:EX
Cc: Plecas, Bobbi ENV:EX; Lesiuk, Tim ENV:EX; Laaksonen-Craig, Susanna ENV:EX; Fradley, Adria N ENV:EX; Crebo, David GCPE:EX; Cotton, Brian GCPE:EX
Subject: RE: media request - DeSmog - LNG Canada emissions

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The reporters figured it out. Basically it comes down to LNG Canada being a two-phase project. The full project is a four-train project. Government's numbers are for the first phase of the project (two-trains). Pembina's numbers are for the full project (four-trains).

If they need more detailed answer I will pluck from your response.

Thanks again
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Cc: Plecas, Bobbi ENV:EX; Lesiuk, Tim ENV:EX; Laaksonen-Craig, Susanna ENV:EX; Fradley, Adria N ENV:EX
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From: Karn, David GCPE:EX
Sent: Thursday, March 22, 2018 4:48 PM
To: Peyman, Hurrian ENV:EX
Subject: RE: media request - DeSmog - LNG Canada emissions

Thanks again.

From: Peyman, Hurrian ENV:EX
Sent: Thursday, March 22, 2018 4:47 PM
To: Karn, David GCPE:EX
Subject: RE: media request - DeSmog - LNG Canada emissions

Great. You have my number if you have any further questions.

From: Karn, David GCPE:EX
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To: Peyman, Hurrian ENV:EX
Cc: Plecas, Bobbi ENV:EX; Lesiuk, Tim ENV:EX; Laaksonen-Craig, Susanna ENV:EX; Fradley, Adria N ENV:EX; Crebo, David GCPE:EX; Cotton, Brian GCPE:EX
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Recommendation

Oord, Haydee ENV:EX

From: Kennedy, Christine PREM:EX
Sent: Thursday, March 22, 2018 10:46 AM
To: Nikolejsin, Dave EMPR:EX; Plecas, Bobbi ENV:EX
Subject: Fwd: When you have them, could you send the final NR, Backgrounder etc.
Attachments: 2018PREM0012-000480.pdf; ATT00001.htm; NaturalGasStrategy-KM.pdf; ATT00002.htm

Christine

Begin forwarded message:

> **From:** "Gibbs, Robb GCPE:EX" <Robb.Gibbs@gov.bc.ca>
> **Date:** March 22, 2018 at 10:38:40 AM PDT
> **To:** "Kennedy, Christine PREM:EX" <Christine.Kennedy@gov.bc.ca>, "Kristianson, Eric GCPE:EX" <Eric.Kristianson@gov.bc.ca>
> **Subject: RE: When you have them, could you send the final NR, Backgrounder etc.**
>
> Just sending out now. Here you go.
> R
> Robb Gibbs
> ADM – Strategic Communications
> Government Communications & Public Engagement
> P: 1-778-698-7469
> C: 1-778-584-1242
>
> ---
>
> **From:** Kennedy, Christine PREM:EX
> **Sent:** Thursday, March 22, 2018 9:57 AM
> **To:** Kristianson, Eric GCPE:EX; Gibbs, Robb GCPE:EX
> **Subject:** When you have them, could you send the final NR, Backgrounder etc.
> Thank you.

BRITISH COLUMBIA

NEWS RELEASE

For Immediate Release
2018PREM0012-000480
March 22, 2018

Office of the Premier

New framework for natural gas development puts focus on economic and climate targets

VICTORIA – As part of a new approach to natural gas development, the British Columbia government is overhauling the policy framework for future projects, while ensuring those projects adhere to B.C.'s climate targets, Premier John Horgan announced today.

"Our new approach welcomes investment that puts our province's people and future first, and rejects the old ways of resource development at any cost," Premier Horgan said. "Our obligation is to the people who call British Columbia home, and our job is to get the best deal for them and the generations that follow."

Under the new approach, all projects should:

- Guarantee a fair return for B.C.'s natural resources.
- Guarantee jobs and training opportunities for British Columbians.
- Respect and make partners of First Nations.
- Protect B.C.'s air, land and water, including living up to the province's climate commitments.

These four conditions form the basis for government's discussions with LNG Canada, which is moving toward a final investment decision on a project that, if approved, would be the largest private-sector investment in B.C. history. This project would see the construction of a natural gas pipeline from northeast B.C. to Kitimat, where a new terminal will process and ship LNG to Asian markets. It is expected to create up to 10,000 construction and up to 950 full time jobs in northern B.C.

"No premier or government can dismiss this kind of critical economic opportunity for the people of British Columbia," Premier Horgan said. "But neither will we turn our back on our commitment to climate targets, or our path to reconciliation with Indigenous peoples."

At the centre of the discussions with LNG Canada is a revised fiscal framework that is designed to put natural gas development on a level playing field with other industrial sectors, accessing the same fiscal policies and working within the same overall B.C. framework to achieve greenhouse gas (GHG) reductions.

The new framework, to which LNG Canada will be subject, provides:

- Relief from provincial sales tax (PST), in line with the policy for manufacturing sectors, subject to repayment in the form of an equivalent operational payment.
- New GHG emission standards under the Clean Growth Incentive Program, announced in Budget 2018.
- General industrial electricity rates consistent with other industrial users in B.C.

- Elimination of the LNG income tax that had required LNG-specific tax rates.

"The LNG Canada proposal has the potential to earn tens of billions of dollars and create thousands of jobs for British Columbians over the life of the project," Premier Horgan said. "It's a private-sector investment that could benefit our province for decades to come, but not at any price – we need to make sure the values British Columbians believe in come first."

The Premier said his government will also expect the LNG Canada project to fit within the goals of the Province's climate-change plan and, specifically, its legislated GHG reduction targets.

"We committed, during the election campaign, to reduce our greenhouse gas emissions by 40% below 2007 levels by 2030, and by 80% by 2050. That remains our goal," Premier Horgan said.

"We cannot achieve the necessary reductions in greenhouse gas emissions and do our part in protecting the global environment without a significant shift to a low carbon economy. The work for all of us – in government, business, labour and beyond – is only just beginning. And all resource development proposals must be considered within the context of our global commitment to protecting our air, land and water."

With B.C.'s new fiscal framework provided to LNG Canada this week, it is anticipated the company will make a final investment decision sometime before the end of this year.

Two backgrounders follow.

Contact:

Jen Holmwood
Deputy Communications Director
Office of the Premier
250 818-4881

BRITISH COLUMBIA

BACKGROUNDER 1

For Immediate Release
2018PREM0012-000480
March 22, 2018

Office of the Premier
Ministry of Environment and Climate Change Strategy

Climate action in British Columbia

On April 1, 2018, the carbon tax will increase by $5 a tonne annually, until 2022.

Increasing the carbon tax meets the requirements set out by the federal government's pan-Canadian climate framework. Rebates will go to a majority of British Columbians.

However, increasing the carbon tax alone will not enable B.C. to meet its long-term greenhouse gas-reduction goals of 40% below 2007 levels by 2030, and 80% by 2050. Significant new climate-action initiatives will be required in order for B.C. to meet these 2050 legislated targets, while encouraging strong economic growth. To ensure an interim target, new legislated targets for 2030 will be introduced later this year. Specific targets for each of the industrial, transportation and building sectors will also be established.

Meeting climate targets will not be easy and will require a concerted effort across all sectors to make the transition to a low-carbon economy. The addition of emissions from LNG will increase this challenge but government is committed to taking the steps necessary to achieve B.C.'s climate goals.

Specific Measures:

- A portion of the carbon tax revenue, paid by large industry, will fund a rebate program to incent the use of the greenest technology available in the industrial sector, including the natural gas sector, to reduce emissions and encourage jobs and economic growth. Some of the revenue will also go into a technology fund, to help spur new, clean technologies in all sectors, to make sure they fit within B.C.'s climate plan.
- The Climate Solutions Clean Growth Advisory Council (CSCG), established in October 2017, is supporting government's goal of reducing carbon pollution, preparing for the impacts of climate change and growing a sustainable economy. The CSCG is comprised of community leaders from across British Columbia, including representatives from First Nations, local government, industry, environmental organizations, academia and labour.
- The CSCG is providing advice on actions and policies to achieve significant greenhouse gas reductions, while taking advantage of opportunities for sustainable economic development and job creation.
- Immediate priorities for the CSCG include achieving emissions reductions in the transportation sector, developing pathways to clean economic growth, as well as policies to support the competitiveness of B.C.'s emissions-intensive and trade-exposed industries.
- Government is working to develop a framework for fugitive emissions that match the federal government's target of a 45% reduction by 2025.
- Government is examining every opportunity to reduce emissions from slash burning by

providing alternative economic usage for slash where available.

- Government has initiated a scientific review of hydraulic fracturing aimed at ensuring that industry in B.C. operates according to the highest-possible standards.

More information on the Climate Solutions and Clean Growth Advisory Council can be found at: https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/advisory-council

Contact:

Media Relations
Ministry of Environment
250 953-3834

Connect with the Province of B.C. at: news.gov.bc.ca/connect

BRITISH COLUMBIA

BACKGROUNDER 2

For Immediate Release
2018PREM0012-000480
March 22, 2018

Ministry of Energy, Mines and Petroleum Resources

British Columbia establishes new framework for natural gas development

Natural gas has a key role to play to provide clean, reliable, affordable and less-carbon-intensive options to global energy markets.

British Columbia has a vast supply of low carbon-intensive natural gas resources in places like the Montney Basin, and has been developing them to support economic growth and job creation at home for decades. B.C. natural gas is an important transition fuel that can help B.C. move to a lower-carbon economy.

While B.C. has been exporting natural gas to U.S. markets for decades, it has an opportunity to export the same fuel to other jurisdictions. To that end, government will introduce a fiscal framework that will provide fair returns to both British Columbians and investors, as well as a climate strategy that will allow B.C. to meet its legislated climate targets.

To ensure British Columbia does it better than anybody else in the world, the provincial government has four key conditions to ensure British Columbians benefit from any proposed LNG development. They are:

- Guarantee a fair return for B.C.'s natural resources.
- Guarantee jobs and training opportunities for British Columbians.
- Respect and make partners of First Nations.
- Protect B.C.'s air, land and water, including living up to the province's climate commitments.

Emerging LNG Proposals

Despite the cancellation of Pacific Northwest LNG, Aurora and Woodside project proposals, several other LNG proponents have expressed renewed interest in developing projects in BC.

LNG Canada

LNG Canada's proposed Kitimat project, should it proceed, represents a very significant economic opportunity for British Columbia – a project that involves one of the largest private sector developments in B.C. history.

Shell and its joint-venture partners have worked constructively to satisfy the provincial government's conditions for LNG, and British Columbia expects LNG Canada will continue to do so moving forward.

LNG Canada is also working to achieve global leadership in low-emissions technology and operations.

Kitimat LNG

Chevron and its partners have expressed continued interest in developing its project in northern B.C. and is focusing on the use of new low-emissions liquefaction technology.

These come as the Province is completing a climate-action strategy in place that meets the Province's greenhouse gas-reduction targets – to reduce B.C.'s greenhouse gas emissions by 40% below 2007 levels by 2030, and by 80% by 2050.

New Framework

The B.C. government has developed a new framework aimed at ensuring British Columbians receive a good return for their natural gas resource and proponents receive a reasonable return on investment.

As part of this work, British Columbia and LNG Canada jointly conducted a financial analysis of the LNG Canada project. This analysis corroborated evidence and information from internationally recognized LNG analysts that B.C. has a competitiveness issue and formed the basis of a mutual understanding upon which the Province is prepared to commit measures that will increase the competiveness of British Columbia's LNG industry.

These measures provide a framework for other industries in British Columbia in similar circumstances – they are not exclusive to the LNG industry or LNG Canada.

As it pertains to LNG Canada, the measures detailed below will only be implemented if the proponents are able to conclusively decide on or before Nov. 30, 2018, to proceed with the construction of the LNG facility and associated investments. These measures below would apply to the entire LNG sector.

1. New Operating Performance Payments

Under current legislation, proponents constructing significant manufacturing facilities would receive a PST exemption on input costs, whereas those proposing to construct LNG facilities would not.

Under the new framework, The B.C. government will exempt LNG Canada from the provincial sales tax (PST), on the construction of their initial proposed facility. This will be conditional on LNG Canada entering into a separate agreement with the province whereby LNG Canada will pay annual operating performance payments over 20 years, a total amount equivalent to what LNG Canada would have otherwise paid in PST during the initial facility construction period.

This framework will be available to all proponents constructing significant manufacturing facilities in the province.Clean Growth Incentive Program

2. The provincial government recognizes that energy-intensive trade-exposed industries, including the natural gas sector, face unfair competition when competing globally with jurisdictions that do not impose carbon taxes. Proponents who make a final investment decision to proceed will be subject to the new Clean Growth Incentive Program, announced by the provincial government in Budget 2018. A benchmark for world-leading clean LNG production will be established as part of this program, replacing existing requirements under the current Greenhouse Gas Industrial Reporting and Control Act.

3. Industrial Electricity Rates

Proponents who make a positive final investment decision will receive the general industrial electricity rate charged by BC Hydro. This is the same rate paid by other industrial users in British Columbia.

4. Removal of LNG Income Tax

The existing LNG income tax is not the most efficient and effective tool for generating returns to British Columbia. It is cumbersome to administer and has led to uncertainties. Government intends to introduce legislation to repeal this tax and instead government will utilize a number other tax and royalty measures under its new fiscal framework, to ensure that British Columbia gets a fair return for its natural gas resource.

New Approach to LNG

As part of establishing a new fiscal framework, the provincial government will take steps to improve the transparency and consistency with which it assesses industrial development opportunities. To that end, government intends to introduce legislation to repeal the Project Development Agreement Act, passed by the previous government, to tie the hands of future governments with respect to the rules governing LNG projects. These measures effectively indemnified proponents against changes. Government will also review and potentially cancel or repeal other LNG measures established by the previous government.

Contact:

Suntanu Dalal
Media Relations
Ministry of Energy, Mines and Petroleum Resources
250 952-0628

Page 115 of 172 to/à Page 116 of 172

Withheld pursuant to/removed as

s.12; s.13

Oord, Haydee ENV:EX

From: Kennedy, Christine PREM:EX
Sent: Thursday, March 22, 2018 9:54 AM
To: Lloyd, Evan GCPE:EX; Gibbs, Robb GCPE:EX; Kristianson, Eric GCPE:EX
Cc: Plecas, Bobbi ENV:EX; Wanamaker, Lori FIN:EX; Haslam, David GCPE:EX; Zadravec, Don GCPE:EX; Nikolejsin, Dave EMPR:EX; Piccinino, Ines EMPR:EX; Foster, Doug FIN:EX; Meggs, Geoff PREM:EX
Subject: Final Deck for Media
Attachments: Natural Gas Technical Briefing - Final.pptx

Final deck attached.

Natural Gas Development Framework
Update and Technical Briefing

Don Wright
Deputy Minister to the Premier
March 22, 2018

BRITISH COLUMBIA

PURPOSE OF BRIEFING

Update on:

- Announcement of a new framework for natural gas development
- Status of ongoing engagement with LNG Canada
  - In preparation for their upcoming meeting of joint venture partners
  - In preparation for their subsequent Final Investment Decision
  - Provisional B.C. commitments to industry competitiveness, subject to positive Final Investment Decision

OUTLINE OF TECHNICAL BRIEFING

I. Background
II. New Government's Position on LNG
III. LNG Canada Project
IV. Economic Impacts
V. B.C. Climate Plan
VI. B.C. Provisional Commitments

I. Background

BACKGROUND

- Previous government's LNG aspirations were overly optimistic
  - 20 projects
  - Very large estimates of future government revenues

BACKGROUND

- Optimistic revenue forecasts reflected in extraordinary measures that LNG proponents were expected to pay
  - LNG electricity price greater than standard industrial rate
  - LNG income tax on top of standard corporate income tax
  - LNG plants not treated as manufacturing facilities with respect to PST

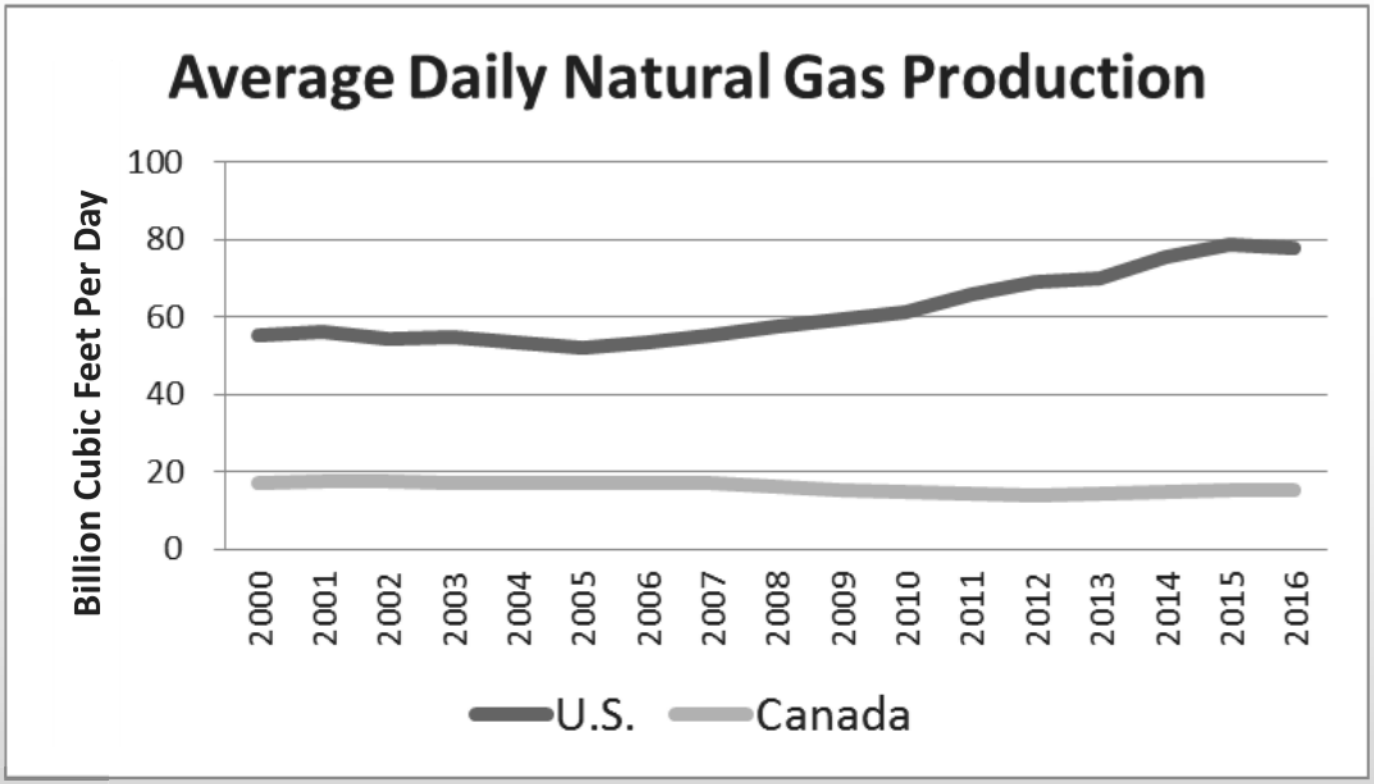
BACKGROUND

- Market evidence of this over-optimism is clear
  - No large LNG plants operating
  - No Final Investment Decision made to start building an LNG plant
  - 5 proponents for plants have cancelled plans

BACKGROUND

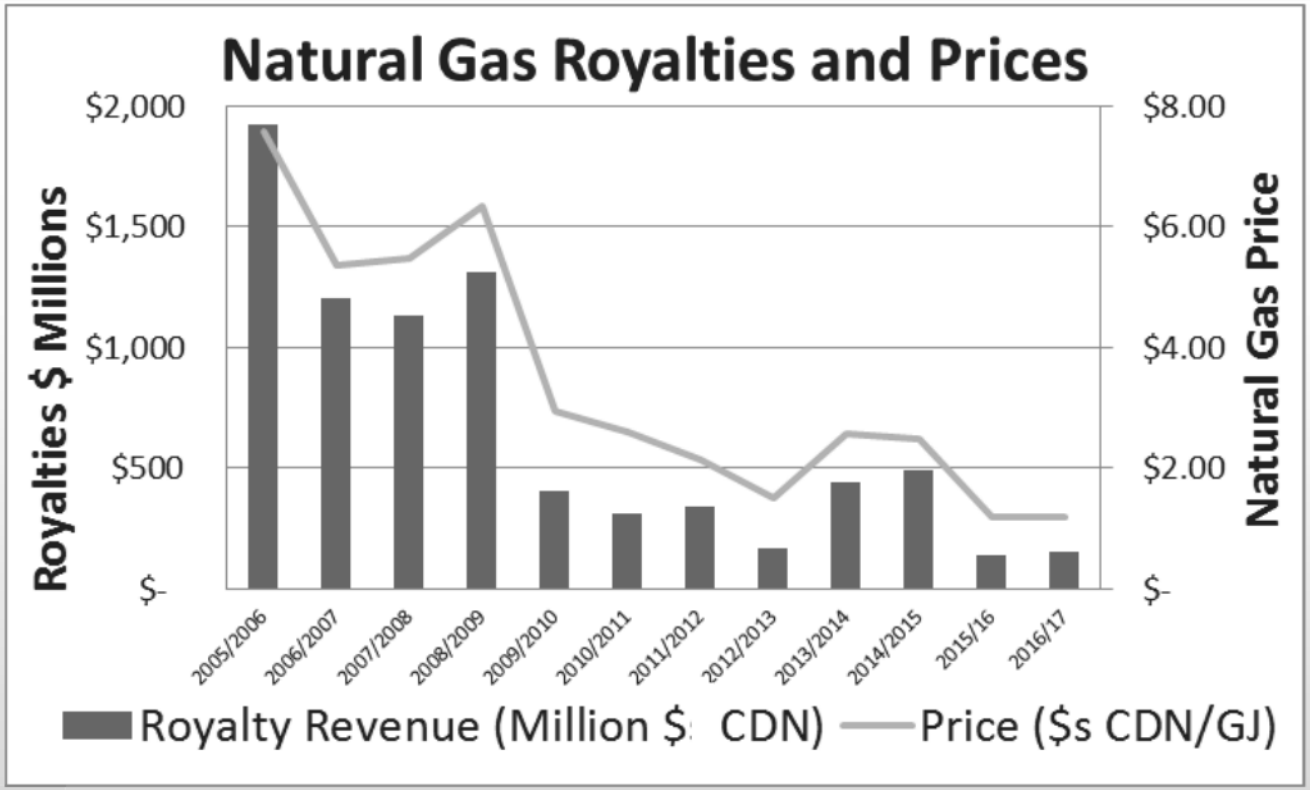
- To be fair, there was a rationale for pursuing LNG based on the relative economics of natural gas sold into the North American market versus the Asia market

NORTH AMERICAN PRODUCTION



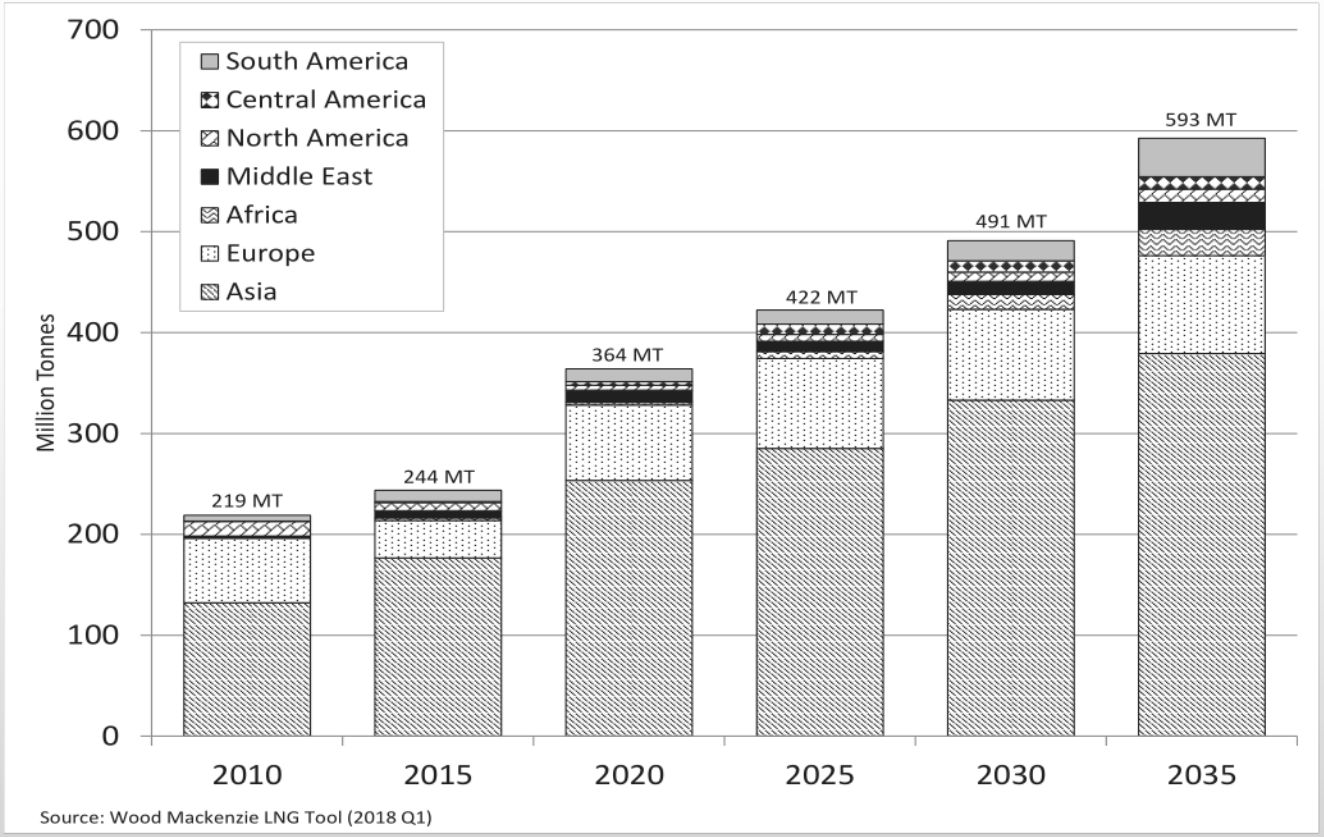
BRITISH COLUMBIA

IMPACT ON NATURAL GAS PRICES AND B.C. GOVERNMENT REVENUES



BRITISH COLUMBIA

PROJECTED LNG DEMAND GROWTH



Source: Wood Mackenzie LNG Tool (2018 Q1)

BRITISH COLUMBIA

II. New Government's Position on LNG

NEW GOVERNMENT APPROACH TO LNG

- Following the 2017 election, the new government asked the Ministries of Energy, Environment and Finance to develop a realistic approach to LNG that could
  - Be accommodated within B.C.'s climate plan
  - Fit B.C.'s commitment to reconciliation with Indigenous Peoples
  - Establish cost-competitive conditions for the industry
  - Maximize financial benefits to B.C. through major investment, job creation and government revenues

CONDITIONS FOR LNG SUPPORT

Cabinet equipped the ministries with four conditions for any LNG development, establishing that any proposals must:

1. Provide a fair return for access to our public resources
2. Include express guarantees of jobs and training opportunities in B.C.
3. Respect and make partners of B.C. First Nations
4. Protect our air, land, water, including support for climate solutions

SUSTAINABLE SHARED PROSPERITY PARADIGM

- Cabinet asked the ministries to approach this analysis recognizing that economic development, climate action and reconciliation are **parallel and mutually dependent** priorities
- This approach acknowledges that
  - The resources to support reconciliation must come from economic growth
  - The resources to advance climate action must come from economic growth
  - Reconciliation is fundamental to growing B.C.'s economy
  - Economic growth has to fit within a low-carbon industrial strategy that enables B.C. to meet carbon goals

III. LNG Canada Project

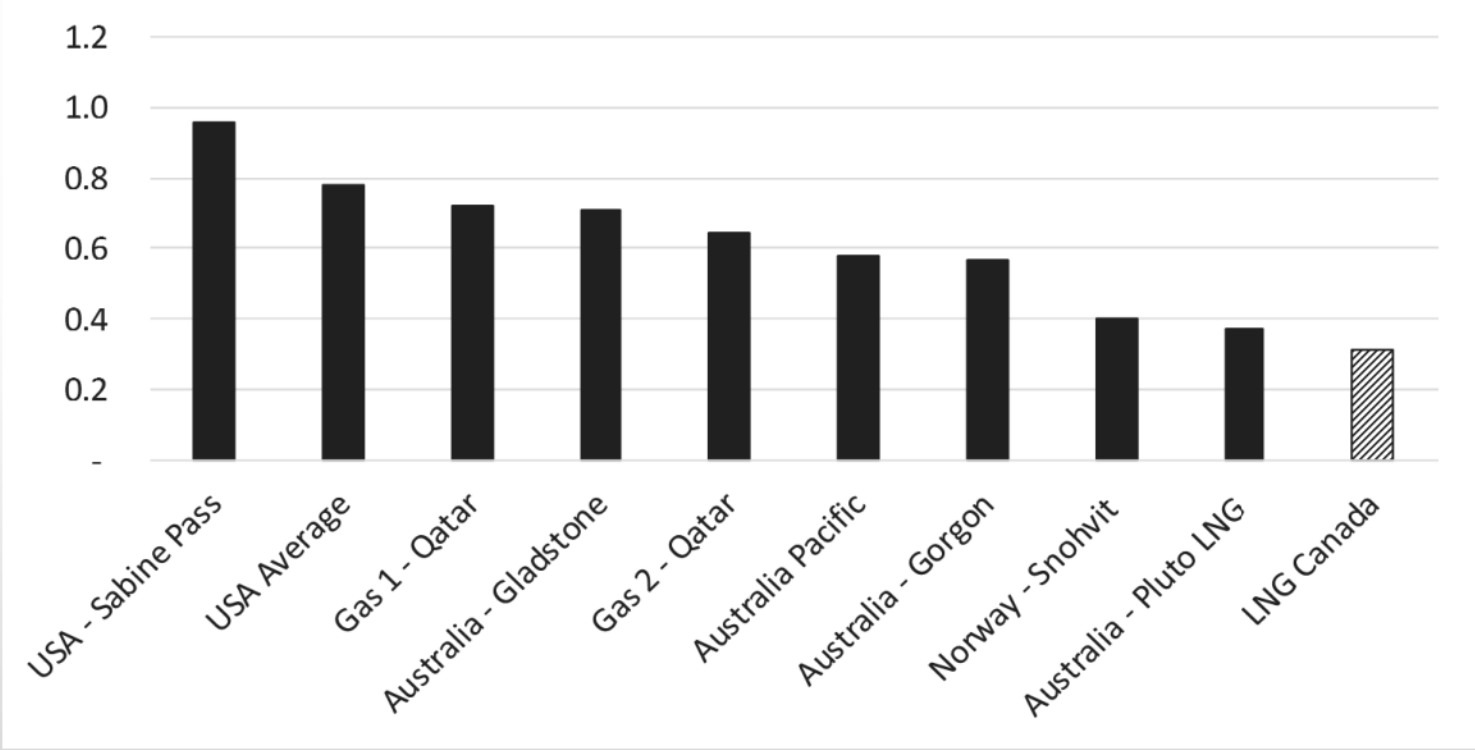
LNG CANADA PROJECT

- LNG Canada is a joint venture of Shell Canada (50%) with PetroChina, KOGAS and Mitsubishi
- The LNG Canada project includes
  - Investment in Northeast B.C. gas fields
  - Coastal GasLink Natural Gas Pipeline to Kitimat
  - Terminal at Kitimat
  - Ships for transport to Asia
- Project has received the support of most – but not all - area First Nations
- Would be the least GHG-intensive large LNG facility in the world

LNG GREENHOUSE GAS EMISSIONS INTENSITY

Global Emissions Intensity Comparison

Emissions Intensity
(tonnes of CO2e emissions per tonne of LNG produced)



BRITISH COLUMBIA

STATUS AND TIMING

- LNG Canada is proceeding to Final Investment Decision
  - Meets with partners next week
  - Final Investment Decision anticipated in 2018
- A decision to proceed would trigger $40 billion in investment
- Cost competitiveness is a key factor in making the investment decision
  - B.C. LNG is competing against LNG projects on the U.S. Gulf Coast

IV. Economic Impacts

LNG CANADA ECONOMIC IMPACTS

The project would:

- Provide significant net government revenue over the next 40+ years
- Provide significant economic benefits for First Nations from Northeast to Kitimat
- Provide good jobs and economic activity in a part of the province that has faced economic challenges
- Be the single biggest capital project in B.C. history
- Support rural economic development
  - LNG Canada expenditures in communities along the alignment already exceed $100 million

DIRECT BC REVENUE POTENTIAL

- The Ministries of Finance and Energy have estimated that the project will generate $22 billion in direct government revenue over the next 40 years
  - Significantly more if “multiplier” effects are taken into account

JOBS AND TRAINING

- Construction employment peaks at 10,000 in 2021
- LNG Canada has agreed to place priority on local, then B.C. hiring
- Target of 25% apprenticeships
- LNG Canada will follow best practices to maximize First Nations participation
- Ongoing direct operational employment (2024-2063) of 950 FTEs
- Construction and operational employment is expected to be primarily high-wage jobs

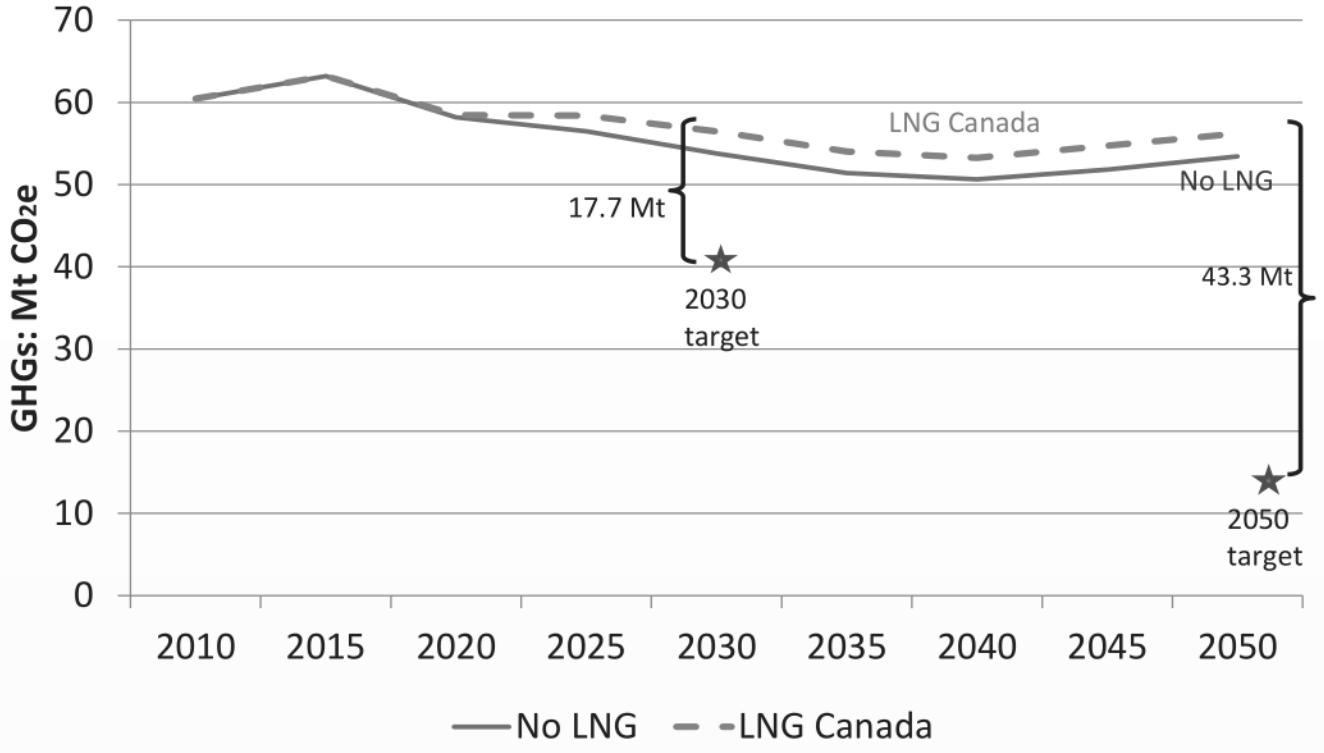
V. Climate Action Plan

CLIMATE ACTION PLAN

- Government is firmly committed to meeting climate goals
- Ministry of Environment is developing a Climate Action Plan
  - Including advice from Climate Solutions and Clean Growth Advisory Council
- Accommodating LNG Canada within our climate goals is possible, but will require that we make faster progress on
  - Electrification of transport and heating
  - Implementing strategies that enable industries to be the least GHG-intensive per unit of output in the world

GHG EMISSIONS FORECAST – CURRENT POLICY

No LNG and LNG Canada



BRITISH COLUMBIA

FORECAST LNG CANADA EMISSIONS

In Megatonnes

Case	Upstream GHGs	Facility GHGs	Total GHGs
LNG Canada 2 Trains	2.27 M	1.8 M	4.07 M
Aggressive upstream electrification (-0.6 M)	1.67 M	1.8 M	3.47 M
Lower incremental BC gas supply (-1.86 M)	0.41 M	1.8 M	2.21 M
Aggressive upstream electrification and lower incremental BC gas supply (-1.97M)	0.3 M	1.8 M	2.1 M

BRITISH COLUMBIA

PREVENTING CARBON LEAKAGE

Government is committed to implementing a comprehensive Climate Action Plan that will meet B.C.'s carbon goals without disadvantaging our large industries

- B.C.'s clean, technologically-advanced industries compete against producers from parts of the world that have low or no carbon price
- Losing market share to companies who pay little or no carbon tax – *known as carbon leakage* – harms B.C.'s economy while causing higher global carbon emissions

COMPETITIVENESS FOR ALL LARGE INDUSTRY

LNG Canada project can serve as a template for establishing a low-carbon strategy for other sectors

- Global benchmark – cleanest in the world
- Rebate on new / additional carbon tax
- Benchmark becomes even cleaner over time

ASIA IS CONVERTING TO NATURAL GAS

- Asian demand for natural gas will continue to grow
  - B.C. can choose to supply low GHG-intensive gas, helping to offset some of developing world's carbon footprint
  - Or we can leave this demand to be supplied with higher GHG-intensive gas from other parts of the world

V. B.C. Provisional Commitments

OPTIONS FACING GOVERNMENT

I. Stick with inherited fiscal framework

   Recognizing low probability of realizing economic benefits from B.C. resource endowments

II. Make changes to improve the cost-competitiveness of LNG development, coupled with stronger commitments on climate change and reconciliation with Indigenous Peoples

   Thereby increasing the potential that one or more LNG projects is able to complete

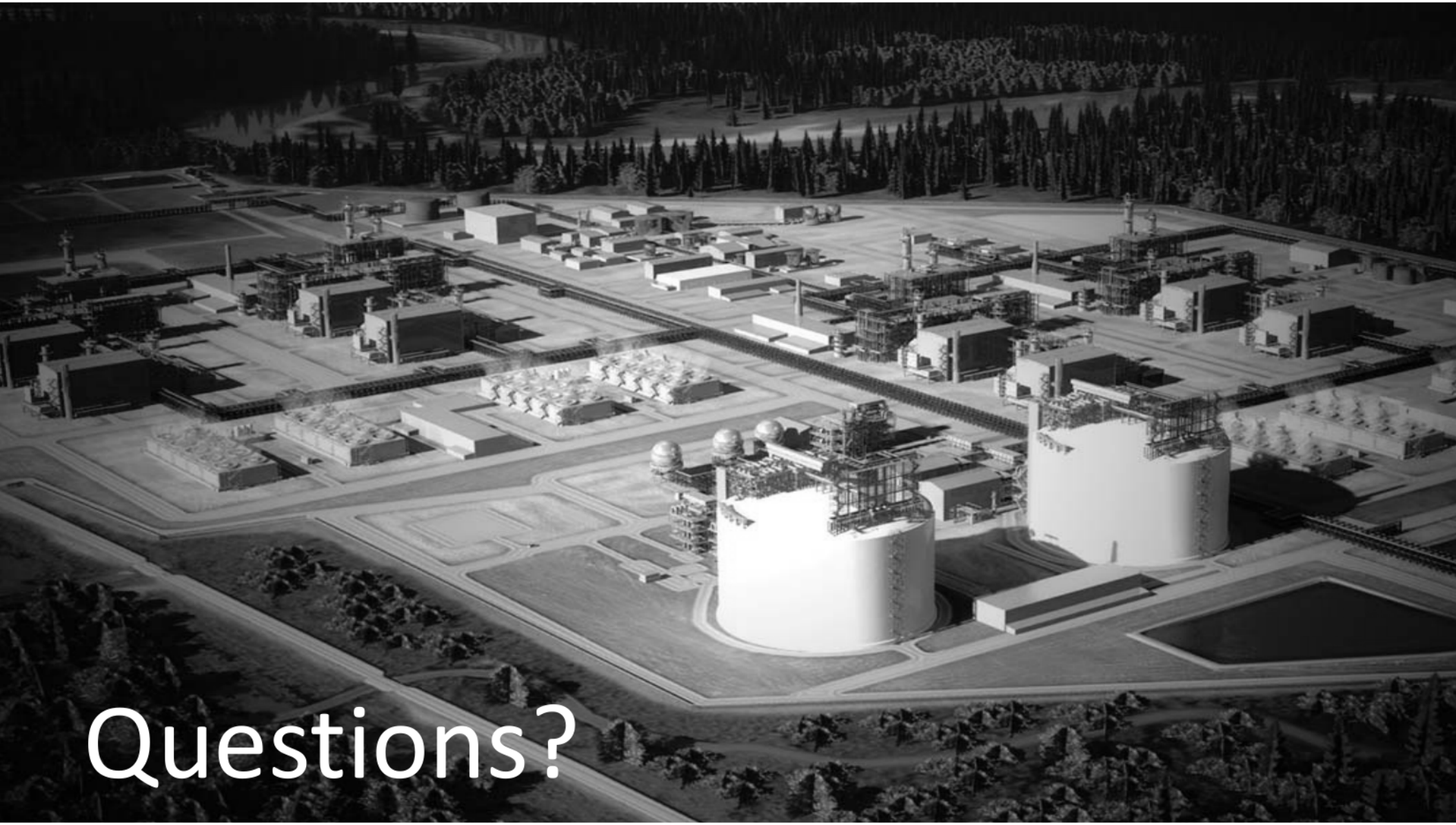
After extensive analysis and deliberation, government has elected to proceed with Option II

SUPPORT FOR COST COMPETITIVENESS

- Government has advised LNG Canada that – if it makes a positive Final Investment Decision by November 2018 – B.C. will:
  - Provide a PST exemption on construction costs of the LNG facility, as would apply to any manufacturing facility
    - However, the government will recapture foregone revenues once the project is up and running
  - Carbon tax treatment consistent with that provided to all large industry
  - Supply electricity at the standard industrial rate
  - Repeal the LNG income tax

IMPORTANT POINTS TO EMPHASIZE

- We are not saying that the LNG Canada project is going ahead
- Government has clarified the fiscal framework that LNG Canada (or any LNG proponent) will face if it decides to proceed
- LNG Canada's decision will depend on their analysis of
  - Relative cost competitiveness
  - Commitments from the federal government
  - Support from First Nations, recognizing the government's commitments to reconciliation and UNDRIP


Questions?

Oord, Haydee ENV:EX

From: Karn, David GCPE:EX
Sent: Friday, March 23, 2018 4:24 PM
To: Lesiuk, Tim ENV:EX
Cc: Peyman, Hurrian ENV:EX; Klassen-Jeffery, Victoria GCPE:EX
Subject: Media request - BiV - LNG

Tim, for Monday.

EMPR will help answer BCHyro response. Also, MGH may do the interview.

Reporter
Nelson Bennett, Reporter
Business in Vancouver
nbennett@biv.com
604-608-5157

Deadline Monday, March 26, 2018 3:00 PM

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Sent: Monday, March 26, 2018 4:06 PM
To: Peyman, Hurrian ENV:EX
Cc: Klassen-Jeffery, Victoria GCPE:EX
Subject: RE: Media request - BiV - LNG

Hurrian, in Tim's absence can you recommend who I should direct Q1 to in CAS?

thanks

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Cc: Peyman, Hurrian ENV:EX; Klassen-Jeffery, Victoria GCPE:EX
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Oord, Haydee ENV:EX

From: Dobson, Neil ENV:EX
Sent: Monday, March 26, 2018 4:22 PM
To: Peyman, Hurrian ENV:EX
Subject: RE: Media request - BiV - LNG

Thanks for the warning

From: Peyman, Hurrian ENV:EX
Sent: Monday, March 26, 2018 4:18 PM
To: Dobson, Neil ENV:EX
Subject: FW: Media request - BiV - LNG

Hi Neil,

I think you're going to get a request from David Karn shortly (I referred him to you). I think he has a lot of the information that he already requested but I made some notes below of extra information to add.

Let me know if you want me to field his request.

Hurrian

From: Peyman, Hurrian ENV:EX
Sent: Monday, March 26, 2018 7:33 AM
To: Lesiuk, Tim ENV:EX
Subject: FW: Media request - BiV - LNG

Hi,

I'm on a call until around noon but I'm available to do any text on this request.

One question that we were asked was how LNG Canada would affect achieving the target. In his email, David had already provided some text about the targets being a challenge, with or without new facilities. I would also want to add in a line that some of LNG Canada (and upstream's) emissions would be offset by lower natural gas for pipeline exports. Then a couple of lines stating that modelling has shown that LNG development and achieving the target are not mutually exclusive and can be accomplished with minimal effect on GDP. Then maybe a few lines about the Council and how it will develop the plan to meet the target in the context of LNG development.

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Sent: Monday, March 26, 2018 5:06 PM
To: Peyman, Hurrian ENV:EX
Subject: FW: Media request - BiV - LNG

fyi

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Sent: Monday, March 26, 2018 5:04 PM
To: Dobson, Neil ENV:EX
Cc: Klassen-Jeffery, Victoria GCPE:EX
Subject: Re: Media request - BiV - LNG

Wed please.

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To: Karn, David GCPE:EX
Cc: Klassen-Jeffery, Victoria GCPE:EX
Subject: RE: Media request - BiV - LNG

Ok David,
When do you need it by?
Thanks
Neil

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Cc: Klassen-Jeffery, Victoria GCPE:EX
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Neil,
Just looking for some input on Q2.

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Nelson Bennett, Reporter
Business in Vancouver
nbennett@biv.com
604-608-5157

Deadline Wednesday, March 28, 2018 3:00 PM

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Sent: Wednesday, March 28, 2018 3:06 PM
To: Dobson, Neil ENV:EX
Subject: RE: Media request - BiV - LNG

There wasn't a lot in the original messaging (https://news.gov.bc.ca/files/Natural_Gas_Technical_Briefing_Final.pdf) about LNG Canada's effect on achieving the reduction target but there was one line, which I've incorporated in the text below. (the second sentence of the first paragraph.)

From: Dobson, Neil ENV:EX
Sent: Wednesday, March 28, 2018 2:30 PM
To: Peyman, Hurrian ENV:EX
Subject: RE: Media request - BiV - LNG

Do you know if this wording is part of what went public last week?

From: Peyman, Hurrian ENV:EX
Sent: Tuesday, March 27, 2018 9:40 AM
To: Dobson, Neil ENV:EX
Cc: Lesiuk, Tim ENV:EX
Subject: RE: Media request - BiV - LNG

Hi,

I've chosen not to include messaging about the global lifecycle emission impact of LNG since it does not directly answer the question at hand. I can pop it in if desired.

This is how I would respond:

s.13

s.13

From: Dobson, Neil ENV:EX
Sent: Monday, March 26, 2018 5:06 PM
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Pinheiro, Nick ENV:EX

From: Jardine, Kevin EAO:EX
Sent: June 19, 2018 10:57 AM
To: Heyman, George ENV:EX
Cc: Frampton, Caelie ENV:EX; Xia, Eveline ENV:EX
Subject: Fwd: BRIEFING NOTE: GHG and LNG Canada
Attachments: IN-MinisterHeyman-GHGs-May2018-FINAL.docx; ATT00001.htm

Here, Minister, is the note. Let me know if you have any questions.

Rgds,
K.
250-361-6753
Please note: This email is intended for the addressee(s) only and may contain legally privileged information. Any unauthorized use, disclosure or reproduction is strictly prohibited.

From: Loiacono, Sabrina EAO:EX
Sent: Wednesday, May 30, 2018 6:31 PM
To: Frampton, Caelie ENV:EX; Xia, Eveline ENV:EX; Neilson, Kirsten ENV:EX; Lo, Reamick ENV:EX; Drew, Ashley ENV:EX
Cc: Jardine, Kevin EAO:EX
Subject: BRIEFING NOTE: GHG and LNG Canada

Good evening,
Attached is a briefing note prepared for Minister Heyman which provides greenhouse gas emissions information related to the Environmental Assessment for the LNG Canada Export Terminal Project. Please let me know if you have any questions or concerns.

S.

ENVIRONMENTAL ASSESSMENT OFFICE
INFORMATION NOTE

May 24, 2018
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PREPARED FOR: Honourable George Heyman, Minister of Environment and Climate Change Strategy

ISSUE: Summary of greenhouse gas (GHG) emissions information related to the Environmental Assessment for the LNG Canada Export Terminal Project (Project).

BACKGROUND:

- The Project is planned to include up to four liquefaction modules (or 'trains'), that would produce an estimated 26 million tonnes of LNG per year at full build out. Construction is planned to occur in two phases, starting with two trains.
- In November 2014, BC passed the *Greenhouse Gas Industrial Reporting and Control Act* that puts in place a GHG intensity benchmark for LNG facilities of 0.16 tonnes of CO_2 equivalent (CO_2e) per tonne of LNG produced. LNG facilities can use offsets and a technology fund to reach the benchmark, and facilities below the benchmark can receive a credit that they can sell.
- On June 17, 2015, the Provincial Government issued Environmental Assessment Certificate (EAC) #E15-01 and the federal government issued its Decision Statement.
    - At full capacity, the Project would increase BC's GHG emissions by 6.6% over 2011 provincial emissions levels (or 0.57% over 2011 Canadian emissions). The Environmental Assessment Office (EAO) concluded that the Project would have a significant residual adverse effect related to GHGs
    - The Project is estimated to have a GHG intensity of 0.15 CO_2e per tonne of LNG produced, which, according to information provided during the Environmental Assessment (EA) process, would make it among the lowest emissions intensities of LNG facilities globally.
- Condition #3 of provincial EAC states:

    "The Holder must develop a greenhouse gas emissions management plan in consultation with MNGD and CAS that sets out the means by which the greenhouse gas management mitigation measures related to Operations in the Mitigation Table under the heading "GHG management" (section 5.3) will be implemented. The Holder must demonstrate reasonable efforts to engage Aboriginal Groups in developing and sharing information regarding implementation of the plan.

    The Holder must provide the final plan to EAO, MNGD, CAS and Aboriginal Groups no less than 30 days prior to the Holder's planned date

to commence Commissioning. The Holder must implement the plan to the satisfaction of the EAO."

- As referenced in Condition #3, Section 5.3.10 of the Application includes the following mitigation measures for Operations:
    - Use efficient aero-derivative gas turbine technology to drive the refrigeration compressors in the liquefaction process;
    - Use BC Hydro power for LNG facility auxiliary electricity supply;
    - Operate combustion sources at optimal efficiency settings to reduce fuel consumption;
    - Adhere to existing flaring and venting reduction guidelines;
    - Minimize flaring or venting, except as required to maintain safe operations and LNG train start up;
    - Conduct preventative maintenance of facility and equipment as per schedule in the maintenance management system;
    - Recover boil-off gas during storage and loading processes, and re-inject the recovered gas into the fuel/feed gas system;
    - Implement a fugitive emissions survey program with the aim to measure, control and manage fugitive emissions; and
    - Develop and adhere to a GHG Management Plan that would consider Best Achievable Technology in current project design and implement best industry practice to manage Project GHG emissions.

DISCUSSION:

- Condition #3 does not assign a cap on emissions, but relies on existing government policies, guidelines, and regulations to direct GHG emissions of the Project.
- The GHG emissions management plan required by Condition #3 has not yet been submitted to the EAO.
- EAO has the responsibility to ensure that the conditions are met by the EAC Holder, but does not have the authority to determine specific technologies or approaches to meeting the conditions, unless specified.

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- Section 19 of the British Columbia *Environmental Assessment Act* allows the Holder of an EAC to apply to the Executive Director of the EAO for an amendment to its EAC. However, neither the EAO nor the Minister can unilaterally amend an EAC, except under very specific circumstances primarily related to non-compliance.

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