



February 29, 2016

Canadian Environmental Assessment Agency
PO Box 10114,
701 West Georgia Street, Suite 410
Vancouver, BC V7Y 1C6

Attn: Lisa Walls, Director, Pacific & Yukon Region, Canadian Environmental Assessment Agency

Dear Ms. Walls,

Re: Response to the document "Review of Related Upstream Greenhouse Gas (GHG) Emissions Estimates"

This document constitutes Woodfibre LNG Limited's ("Woodfibre LNG") response to the document "Review of Related Upstream Greenhouse Gas (GHG) Emissions Estimates" prepared by Environment and Climate Change Canada and released by the Canadian Environmental Assessment Agency ("CEA Agency") on February 9, 2016.

Woodfibre LNG's response is divided into two parts. The first part of this document addresses the government of Canada's ("Government") five principles announced in Ottawa on January 27, 2016 concerning environmental assessments (the "Five Principles") and their general applicability to the Woodfibre LNG Project (the "Project"). The second part of this document specifically responds to the Environment and Climate Change Canada analysis of possible upstream GHG emissions associated with the Project.

Addressing the Five Principles

Woodfibre LNG understands this additional review of upstream GHGs is related to the Government's objectives as outlined in the Five Principles. Woodfibre LNG further understands these principles to be the following¹:

The following (5) principles are intended to provide greater certainty as to how the Government of Canada will be guided in the application of its discretionary decision-making authorities for projects being assessed during the review of environmental assessment processes:

¹ Government of Canada, Government of Canada Moves to Restore Trust in Environmental Assessment, media release, January 27, 2016. As found at: <http://news.gc.ca/web/article-en.do?nid=1029999>

1. *No project proponent will be asked to return to the starting line — project reviews will continue within the current legislative framework and in accordance with treaty provisions, under the auspices of relevant responsible authorities and Northern regulatory boards;*
2. *Decisions will be based on science, traditional knowledge of Indigenous peoples and other relevant evidence;*
3. *The views of the public and affected communities will be sought and considered;*
4. *Indigenous peoples will be meaningfully consulted, and where appropriate, impacts on their rights and interests will be accommodated; and*
5. *Direct and upstream greenhouse gas emissions linked to the projects under review will be assessed.*

During the interim period, timely decisions on individual projects will depend upon the provision of sufficient information and evidence in accordance with these principles. Where required, steps will be taken to gather additional evidence.

It should be noted that before the Five Principles were announced, Woodfibre LNG recognized the importance of engagement with the public and Indigenous peoples and the importance of ensuring that the regulators would be in a position to make decisions that were based on science and reflected aboriginal traditional knowledge. Accordingly, Woodfibre LNG has, throughout its environmental assessment ("EA") process, made an effort to ensure that it has taken steps to exceed the regulatory requirements, particularly with respect to public consultation and Aboriginal engagement. This may be described as trying to achieve that ambiguous goal of "social license".

Social license was first defined in 1997 by former Placer Dome executive Jim Cooney. The term has been used and abused since that time, but Cooney himself, in recent interviews has placed some parameters around the term—parameters that Woodfibre LNG took seriously as it pursued its provincial and Squamish Nation Environmental Assessment Certificates and a decision under the *Canadian Environmental Assessment Act 2012, SC 2012, c.19 (CEAA 2012)*.

Cooney stated social license involves three primary elements²:

1. *It must involve a structured communication process between proponents and the full range of local stakeholders.*
2. *Where there is risk — and there often is when big industrial projects are involved — proponents have to demonstrate they are willing and able to go beyond minimum requirements to protect both the people and the environment*

² Don Cayo, Companies that want to build big must go beyond minimum requirements, Vancouver Sun, December 12, 2014. As found at:
<http://www.vancouversun.com/cayo+companies+that+want+build+must+beyond+minimum+requirements/10464221/story.html#ixzz3zE2inBS8>

3. *A specific impacts-benefits agreement — something along the lines of what has become commonplace with First Nations — needs to be negotiated.*

Woodfibre LNG's progressive approach to Cooney's description of social license has meant that the company is well placed to satisfy the Five Principles.

Principle 1 - No project proponent will be asked to return to the starting line

First, we appreciate that no project will be sent back to the "starting line". Large capital investment is not undertaken lightly. One of the factors that British Columbia ("BC") and Canada cite in attracting capital investment is the rule of law and regulatory certainty, both of which are extremely valuable to investors who are seeking low risk, high certainty environments into which they can invest. It is important that these attributes are not eroded by shifting targets, changing requirements, and delaying decisions, particularly after a proponent has engaged in the process.

LNG projects are dependent upon LNG off-take agreements. In this industry, LNG buyers watch project development very closely and wait to enter into serious discussions for off-take until it is clear that a project has crossed key thresholds. One of the key thresholds in Canada is the receipt of environmental assessment approvals. The buyers are aware of the processes and have questions and concerns when the process changes.

Woodfibre LNG initiated work to fulfil the requirements of the *CEAA 2012* and the BC *Environmental Assessment Act*, SBC 2002, c. 43 ("BCEAA") almost three years ago, with an understanding of the regulatory framework and statutory requirements for completing such an assessment. In the intervening period, Woodfibre LNG has engaged numerous consultants, experts, and scientists, invested millions of dollars, conducted public consultation beyond the requirements of the regulatory process, voluntarily engaged in a separate First Nations environmental process, and produced many volumes of material in support of its application. The EA process began in November 2013 and an application was filed in January 2015 with an expectation that decisions by the provincial and federal Ministers would follow in accordance with the BCEAA and *CEAA 2012*. The provincial decision was rendered in October 2015. A federal decision has yet to be made.

Woodfibre LNG acknowledges the Government's interest in understanding upstream greenhouse gas emissions related to the Woodfibre LNG Project, but it also appreciates the Government's intention not to delay or "restart" the process.

Principle 2 - Decisions will be based on science, traditional knowledge of Indigenous peoples and other relevant evidence

From the beginning Woodfibre LNG has employed reputable and recognized subject-matter experts and qualified professionals³ as part of its EA baseline data collection and Application for an EA Certificate ("Application"). These include consultants from firms such as Golder Associates, Hemmera Envirochem Inc., Moffat & Nichol, Keystone Environmental, Lloyds Register, Abbot Risk Consulting, and numerous other qualified subcontracted firms and individuals.

In addition, Woodfibre LNG has made subject-matter experts available to members of the Working Group, District of Squamish, Aboriginal groups, and to the public at open houses, in order to provide scientific information and to respond to questions. Written responses to information requests, specific letters to interest groups, and responses to public comments have also been supported by scientific evidence and expertise.

It's worth noting that the majority of these qualified professionals belong to professional associations, including the Association of Professional Engineers and Geoscientists of BC and the College of Applied Biology, and all have their own code of ethics and criteria for their membership. These associations also have the ability to discipline members who violate the code of ethics.

This scientific and consultation approach was bolstered throughout the EA process by the Working Group, which is comprised of professionals and experts from relevant federal and provincial regulatory agencies as well as representatives of Aboriginal groups and local governments, and led by the BC Environmental Assessment Office ("EAO"). This body is a key forum for the interagency and Aboriginal group sharing of scientific, regulatory, and traditional knowledge as it pertains to reviewing the project and developing conditions should the project be allowed to proceed. Its work informs both the Application and the conditions imposed on a proponent.

In addition, Woodfibre LNG participated in the Squamish Nation's independent environmental assessment process, which included the traditional knowledge of the Squamish Nation and qualified environmental consultants. More information on this ground-breaking process is described elsewhere in this submission.

³ The BC Ministry of Environment provides some direction as to what constitutes a qualified professional. An appropriately qualified professional means an applied scientist or technologist specializing in a relevant applied science or technology including, but not necessarily limited to, agrology, forestry, biology, engineering, geomorphology, geology, hydrology, hydrogeology or landscape architecture. An appropriately qualified professional must be registered in British Columbia with the appropriate professional organization, and acting under that association's Code of Ethics and subject to disciplinary action by that association. He or she must also be someone who, through demonstrated suitable education, experience, accreditation and knowledge relevant to the particular matter, may be reasonably relied on to provide advice within his or her area of expertise.

In light of the above information, Woodfibre LNG is confident that the Application reflects the diligent contributions of scientific experts, qualified professionals and indigenous peoples. A renewed commitment to science and traditional knowledge, as the key factors in considering EAs, will strengthen public trust in the good work already being carried out by government officials and scientific professionals.

Principle 3 – The views of the public and affected communities will be sought and considered

Federal and provincial EA processes applicable to the Woodfibre LNG Project required public consultation in three instances:

1. When the federal government was considering whether to grant substitution to the provincial government, consultation consisted of an online public comment period.
2. Upon completion of the Valued Component Selection Document by the proponent, the Working Group and the EAO, there was a requirement for an additional online public comment period and one Open House in Squamish, BC.
3. The Application was subject to a third online public comment period and three required Open Houses in the communities of Squamish, West Vancouver, and Bowen Island hosted by Woodfibre LNG.

Woodfibre LNG recognized these to be minimum requirements and merely a starting point for building a long-term relationship with the community. Woodfibre LNG is committed to building a project that is right for Squamish and right for BC, and that includes acting on community priorities that have been identified through a robust community consultation and communication program. Accordingly, its consultation and communication with the public and affected communities has exceeded these requirements. To date Woodfibre LNG, BC Hydro, and FortisBC have carried out the following additional public consultation activities relating to the Project:

- Seven additional open houses
- Seven additional open houses by FortisBC and BC Hydro
- One community roundtable on Gambier Island
- 10 small-group meetings, (Roundtable Q&As)
- 350+ stakeholder meetings (ongoing)
- Two telephone town halls
- In 2014, Woodfibre LNG, with our pipeline partners FortisBC, opened the Squamish Community Office. The office is open a minimum of four days a week for visitors, and local staff is active in community events.

- Two business information sessions for possible contractors, employees and service providers
- Seven newsletters from Woodfibre LNG and two from FortisBC to date (on going)

These activities have resulted in more than 4,000 personal interactions with the public alone between 2013 and fall of 2015.

In addition, Woodfibre LNG engaged local government through separate presentations to the District of West Vancouver, Squamish Lillooet Regional District, and Sunshine Coast Regional District. Four presentations to date (not including staff-level meetings) have been made to District of Squamish Council. District of Squamish Council members also participated in two guided site visits.

Woodfibre LNG also funded and supported the creation of the District of Squamish Citizens Committee, a community committee made up of 12 citizen volunteers as well as representatives of the District. Volunteer members were selected by the municipality. According to the District of Squamish website:

The committee's mandate is twofold. It will provide input to staff as the technical advisors who will help inform Council prior to the District's response during the provincial environmental application review phase of the project. The committee will also provide feedback directly to the project proponents on certain technical matters that could mitigate impacts or enhance the project in the eyes of the community. Such technical matters include decisions that will be made on: water- compared to air-cooling technology, land- compared to water-based plant structures, environmental, safety and community impacts.⁴

The committee met over the period of approximately one year and heard presentations from the following agencies and organizations as well as multiple presentations by Woodfibre LNG and its various qualified professional consultants:

- BC Safety Authority presentation
- Industry Training Authority LNG Trades Planning
- Linde Engineering
- Fortis BC Eagle Mountain – Woodfibre Gas Pipeline Project
- BC Oil and Gas Commission

⁴ District of Squamish, Community Committee on Woodfibre LNG. As found at: <http://squamish.ca/business-and-development/economic-development/projects-in-our-community/woodfibre-lng-community-committee/community-committee-on-woodfibre-lng/>

- Canadian Coast Guard
- BC EAO
- Pacific Pilotage Authority
- Vancouver Aquarium
- Clean Energy Canada

Following the completion of the committee's work and its reporting out in spring 2015, the District of Squamish decided to carry out a further facilitated public meeting on the Woodfibre LNG Project. Woodfibre LNG agreed to support this consultation through funding and provision of materials, but had no role in the organizing of the meeting, the selection of facilitators, format or terms of reference—all was led by District of Squamish elected officials and staff.

Beyond this, Woodfibre LNG also created significant social media tools to further supplement the work described above. Woodfibre LNG created a Facebook page where Project updates are posted daily and questions from the public are answered. To date, the Woodfibre LNG Facebook page has more than 5,100 "likes". In fall of 2015, a series of posts, leading up to the EAO certificate approval, resulted in more than 367,000 people reached and over 33,000 people taking action (e.g., sharing, liking, watching).

Woodfibre LNG maintains an active YouTube channel with 60 videos (and growing), which describe various aspects of the Project, answer popular questions, and provide Squamish residents the opportunity to explain why they support the Project. One of the most watched videos describes Woodfibre LNG's role in cleaning up Howe Sound; it has more than 23,000 views.

In an effort to keep the conversation going beyond the required public comment period and throughout the Project life, Woodfibre LNG launched an online tool called askwoodfibrelng.ca. The question and answer website provides an interactive environment for anyone, regardless of location or interest, to ask a question of Woodfibre LNG staff. Responses to the most popular questions are auto-generated and immediate. Answers to unique questions are typically posted within one to three business days, depending on the complexity of the question. Over a two-month period, askwoodfibrelng.ca received more than 8,000 unique visitors.

In addition, Woodfibre LNG has an active website; www.woodfibrelng.ca that provides regular Project updates and information. Over a two-month period, the site received more than 7,000 unique visitors.

Woodfibre LNG also has a LinkedIn page, which is regularly updated. The page is aimed at stakeholders in the business community, as well as those looking for job opportunities with Woodfibre LNG. The page currently has more than 630 followers.

Woodfibre LNG is of the view that it has gone well beyond what is required to gather the views of the public and affected communities, in an effort to build a better project. The Woodfibre LNG Project site is located in a municipality of approximately 17,000 and a regional district with a population of approximately 39,000, and the company has embraced a wide range of communication activities to share information and broaden the dialogue. In fact, based on the data above, more than 300,000 interactions have taken place between Woodfibre LNG and members of the public since December 2013.

Woodfibre LNG takes public engagement seriously and the views of the public and affected communities have resulted in meaningful changes to the Project. For example, the decision to power the facility with electricity from BC Hydro, instead of natural gas, was the result of community concerns about the proposed project's potential impact on air quality. By using electricity instead of natural gas, GHG emissions will be reduced by approximately 80%, making Woodfibre LNG one of the lowest GHG-intensity liquefaction facilities in the world. As well, Woodfibre LNG modified the Project layout – from a floating liquefaction facility to land-based facility – as a result of community concerns that a floating liquefaction plant could increase underwater noise in Howe Sound and negatively impact marine mammals and fish. While studies showed that underwater noise associated with a floating processing facility could be mitigated through design, Woodfibre LNG made the decision to move the processing facility from water to land.

Woodfibre LNG is of the view that constructive conversations, even with opponents, can result in a better project. The extensive engagement described above demonstrates its commitment to this effort.

Principle 4 - Indigenous peoples will be meaningfully consulted, and where appropriate, impacts on their rights and interests will be accommodated

Woodfibre LNG acknowledges the importance of Principle 4. It is increasingly clear that consultation with Aboriginal groups needs to be meaningful and to go beyond the development and production of traditional consultation records.

Part of meaningful consultation involves determining how indigenous peoples wish to be consulted in respect of a project. This may depend on the level of impact or the capacity of Aboriginal groups to participate. It may also depend on their view of the way aboriginal rights and title issues fit within an environmental assessment process.

For example, according to the Boreal Leadership Council:⁵

Canadian assessment and regulatory bodies must act within the scope of their legislative mandates. Typically, they will consider impacts on the environment and the adequacy of mitigation measures but most are not empowered to determine whether consent has been granted or whether consultation has been adequate. Aboriginal rights may figure into such assessments only to the extent that project activities may affect specific issues of importance to the Aboriginal group, such as sacred sites or harvesting activities. Taking into account the significance of such impacts and whether they can be mitigated, this is, at best, an indirect approach...

From the beginning Woodfibre LNG has recognized the importance of, and has been committed to meaningful consultation with potentially impacted indigenous peoples. For example, Squamish Nation made it clear early on that traditional participation in the EA process would not sufficiently address its needs for meaningful consultation:

...the Crown has always presumed that it could proceed with the assessment of proposed projects, and fulfil its duties to consult Squamish, through established environmental assessment (EA) processes under the BC Environmental Assessment Act and the Canadian Environmental Assessment Act. However, in Squamish's view these processes fall short of what is required to fulfil the Crown's constitutional obligations to Squamish, and certainly do not provide a venue through which Squamish's consent for proposed projects could be secured. As a result, the Squamish Nation has developed and is now implementing its own independent assessment process for major projects proposed in its territory ("Squamish Nation Process").⁶

Woodfibre LNG agreed to voluntarily engage in the Squamish Nation Process in addition to the provincial EA process. Participating in the Squamish Nation Process presented many risks and demanded a lot of trust from all involved, including the regulators, because it was new, evolved over time, and did not fit squarely within the timelines, expectations, and processes of the provincial EA process. Woodfibre LNG was prepared to accept this risk and to work closely with Squamish Nation because it recognized that the long-term success of the Project is closely linked to establishing a relationship with affected indigenous peoples.

⁵ Boreal Leadership Council, Understanding Successful Approaches to Free, Prior, and Informed Consent in Canada. Part I., p. 11.

⁶ Bruce, Aaron & Hume, Emma; ABORIGINAL ADMINISTRATIVE LAW CONFERENCE PAPER 2.1, The Squamish Nation Assessment Process: Getting to Consent, June 2015, p. 1.

Woodfibre LNG's decision to participate in the Squamish Nation process presented a challenge to federal and provincial regulators. Standard EA processes require extensive "consultation records" documenting meetings, calls, and interactions with Aboriginal groups from first contact, to the final filing of the application and beyond. In some cases this can be meaningful, particularly where the questions and concerns are primarily environmental – indigenous people can raise questions and concerns about a project and the regulator ensures that the record reflects that the proponent has addressed those questions and concerns.

However, as suggested by Squamish Nation and the Boreal Leadership Council cited above, this process may be less meaningful in addressing impacts on aboriginal rights and title. The Squamish Process was intended to address this gap and to enable Squamish Nation to assess those impacts for itself. It was conducted by the Squamish Nation, involved gathering information through the EA process and through direct engagement with Woodfibre LNG, and consultation by Squamish Nation within the community.

The Squamish Nation process resulted in Woodfibre LNG being granted a Squamish Nation Environmental Assessment Certificate, as well as a contractual agreement between Squamish Nation and Woodfibre LNG. The commitments by Woodfibre LNG and Squamish Nation were articulated in a Framework Agreement between the parties. While the terms of that agreement are confidential, publicly disclosed elements of the Squamish Process include the following:

- *Squamish Nation will undertake their own independent assessment of the project, and make their own determination on impacts on the Nation's Aboriginal rights and/or title.*
- *The Squamish Nation Process is confidential. Proponents agree to not provide any information regarding Squamish Nation Aboriginal Rights & Title, or any other interests, in their EA submissions to provincial or federal governments unless the Nation consents.*
- *The Squamish Nation Process parallels, to the extent possible, the Crown EA to provide some certainty to proponents and the Crown.*
- *The Nation does not formally participate in the Crown EA, but agrees to use technical information submitted in the Crown process in its assessment of a project to avoid duplication of information and to make the Squamish Nation Process efficient and less costly. The Nation may send a technical consultant to attend EA Working Group sessions to get clarification on technical information. This also helps the Nation obtain as much relevant information that may be available and can use this information in its Process in tandem with information it has collected through other means.*
- *The proponent agrees to provide supplemental information, even if this information is not required under the EA process, to the Squamish Nation through an information request process.*

- *The Nation is able to fully consider the outcomes of an independent Traditional Use and Occupancy Study and how this information pertains to its understanding of the project rather than allowing the proponents and Crown to make those determinations based on their assumptions. The proponent agrees to pay process fees that will fully fund the Squamish Nation Process.*
- *If the conclusions of the Process point to approval, the Nation will issue a Certificate of Project Approval setting out the conditions of approval. This takes the form of a legally binding agreement, but is not the same as, and is separate from, any form of impacts and benefits agreement.⁷*

According to the Squamish Nation, a key to the success of its process is a "cooperative proponent". There is no legislation that required Woodfibre LNG to enter into a separate Aboriginal group EA process. However, as Woodfibre LNG's intention was not merely to consult but to build a strong long-term relationship with Squamish Nation, it was prepared to work with Squamish Nation to establish a foundation based on full engagement.

Woodfibre LNG has demonstrated and continues demonstrate, possibly in a manner without precedent, how project proponents can carry out the Crown's delegated consultation and accommodation in meaningful manner.

Principle 5 - Direct and upstream greenhouse gas emissions linked to the projects under review will be assessed

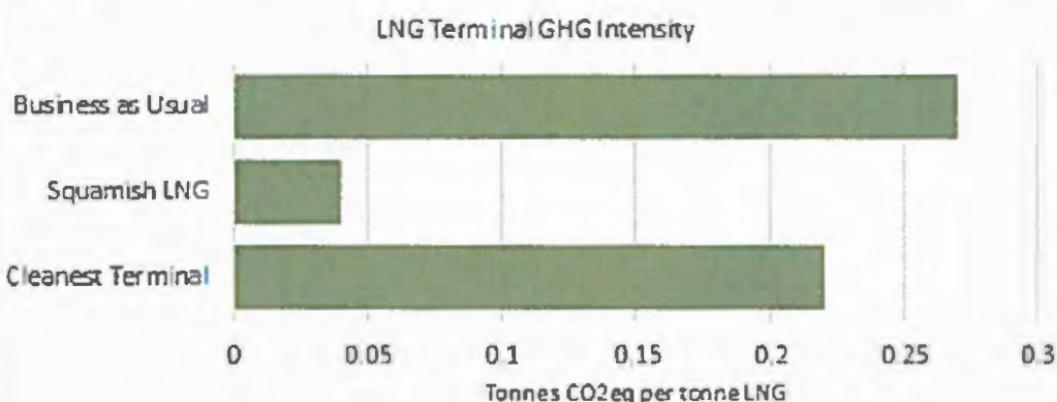
As mentioned in the analysis, Woodfibre LNG does not own any upstream assets, rather it will be purchasing its natural gas supply through the open market.

However, Woodfibre LNG is taking steps to reduce the direct GHG emissions associated with the Project. Woodfibre LNG will use electricity from BC Hydro (approximately 92% renewable electricity) instead of natural gas to power its facility. This decision will reduce GHG emissions by approximately 80%. According to a presentation to the District of Squamish LNG Community Committee by Clean Energy Canada in 2014, by choosing electric drive, the Project may be the cleanest in the world.⁸ The graph below is from Clean Energy Canada's presentation to the committee.

⁷ Ibid.

⁸ Jeremy Moorhouse, One piece of the carbon puzzle – electric LNG in Squamish. Presentation to the District of Squamish LNG Community Committee, July 17, 2014. As found at: <http://squamish.ca/business-and-development/economic-development/projects-in-our-community/woodfibre-lng-community-committee/agendas-minutes-and-presentation-materials/>
This was qualified by stating that the LNG product itself may not qualify due to upstream emissions

How does electric LNG in Squamish compare with alternative power supplies?



Again according to Clean Energy Canada;

"Woodfibre LNG intends to link its facility directly to the BC Hydro grid, which delivers 92-per-cent clean and renewable electricity. As a result, at least from a carbon-pollution perspective, its LNG would indeed beat the global gold standard for carbon pollution."⁹

Over the long term this use of electricity will contribute to meeting Canada's overall GHG reduction targets. This is in addition to the global GHG reduction resulting from displacement of other fossil fuels, including coal with cleaner burning natural gas. According to the UN International Panel on Climate Change:¹⁰

"GHG emissions from energy supply can be reduced significantly by replacing current world average coal-fired power plants with modern, highly efficient natural gas combined-cycle power plants or combined heat and power plants, provided that natural gas is available and the fugitive emissions associated with extraction and supply are low or mitigated (robust evidence, high agreement)."

⁹ Merran Smith, Clean Energy Canada, editorial Vancouver Sun, May 20, 2014.

¹⁰ United Nations International Panel on Climate Change's (IPCC) Working Group 3, April 2014.

Project-related effect on upstream GHG emissions

Woodfibre LNG has reviewed Environment and Climate Change Canada's analysis (the "Analysis") of the possible Project-related effect on upstream GHG emissions. Woodfibre LNG does not dispute the methodology used to estimate those emissions. However, we do have concerns regarding the assumption of attribution. The fundamental question is one of cause and effect. Can Woodfibre LNG be legitimately identified as the cause (or single cause) of the estimated carbon emissions in the Analysis?

As context to the Analysis, it is important to understand the current state of gas production in Canada. Before the shale gas revolution in United States ("US"), gas production in Canada was stable at 18 billion cubic feet day (bcfd), of which half was exported to the US. After 2007, with the rapid increase of shale gas production in the US, the demand for Canadian gas steadily decreased. US natural gas consumption continues to rise, despite reduced Canadian exports. Consumption for 2015 is estimated at 72 bcfd rising to 110 bcfd by 2035 and production has grown dramatically. The US Energy Information Administration ("EIA") estimates that marketed natural gas production averaged over 79 Bcf/d in 2015.¹¹

To put matters in another perspective, exports from Canada to US have reduced from approximately 9.5 bcfd in 2000 to 5.1 bcfd in 2014 according to the EIA. Woodfibre LNG's gas requirement is approximately 290 million standard cubic feet per day (mmscfd). This is a fraction of the gas volume being traded in the main gas hubs in BC and Alberta. These hubs trade the following approximate amounts¹²:

- AECO : 12 bcfd
- Station 2 : 2 bcfd
- Huntingdon/Sumas : 1.7 bcfd

So while US consumption has increased, Canadian exports have decreased as US changes from a customer to a competitor. Therefore GHG emissions from Natural Gas produced by Canada have not been reduced, they have simply been displaced.

During the same period, with the successful exploration and development of shale gas resources in Canada, the proven gas reserves have increased from 60 trillion cubic feet in 2000 to 70 trillion cubic feet in 2012. All of this activity has taken place in the absence of the construction of any LNG export facilities in the province of BC.

¹¹ US Energy Information Administration, Short Term Energy Outlook, February 9, 2016. As found at <https://www.eia.gov/forecasts/steo/report/natgas.cfm>

¹² US Energy Information Administration, Natural Gas. As found at: <https://www.eia.gov/naturalgas/data.cfm#imports>

The concern with the form of the Analysis is one of causal reductionism—whereby it is not clear that the construction and operation of the Project would have any measurable effect on current or increased gas production in BC or Alberta and thereby directly cause a change in upstream GHGs.

Assumption regarding source of gas

The Analysis presumes two possible scenarios for source gas: 100% of gas is supplied from BC sources and 75%/25% supply of gas from BC and Alberta, respectively. While a legitimate starting point, as Woodfibre LNG has indicated in the Application, the company does not own upstream assets. Accordingly, the mixture of gas procured on the market may change on a regular basis. While this does not undermine the premise of the analysis, it does affect its degree of accuracy.

It is recognized that gas sourced from different basins, such as the Montney, Liard and Horn River basins in Northeast British Columbia, have different compositions and carbon content.

Assumption of the impact of smaller players such as WLNG on existing production

As stated in page four of the Analysis, it is acknowledged that Woodfibre LNG Project operation may not result in incremental GHG emissions.¹³

Woodfibre LNG's analysis, carried out as part of the Squamish Nation EA process, determined that based on the surplus of proven gas resources, declining consumption, and difficult access, no additional wells would be required to support the Project's 2.1 million tonnes per annum of LNG export production under current market conditions. At Squamish Nation's direction, Woodfibre LNG also conducted a hypothetical model to determine how many wells would be required to supply the Project if ~~no~~ proven gas reserves currently existed in Canada. Woodfibre LNG determined that (based on the long-term average) each new well can produce approximately 5 million cubic feet per day. Therefore, in a hypothetical scenario, 60 wells would be required to support the Project's export capacity of 2.1 million tonnes of LNG per annum if no production existed today.

The ability of smaller LNG facilities to affect production or upstream behaviour is limited. It is logical that if a project can be held responsible for additional upstream emissions, then it should follow that if the project does not proceed, upstream GHG emissions would drop or not grow by the same factor. However, in reality, this would not be the case.

¹³ Canadian Environmental Assessment Agency, Woodfibre Liquefied Natural Gas (LNG) Project: Review of Related Upstream Greenhouse Gas (GHG) Emissions Estimates Summary, February 2016, p.4.

Assumption regarding the static nature of the behaviour of suppliers and transporters over the 25-year period

There is a degree of speculation in an analysis projecting 25 years into the future, which is why GHG projections often consider different scenarios. For example, if the upstream sector were to electrify (an objective being pursued by the BC government and BC Hydro) what would the 25 year projections look like? Such models may be useful in the future to help provide an illustration of the benefits of such an endeavour and its relevant effect on the Project's perceived upstream emissions.

Necessity to consider the implications of current and impending climate related regulatory and policy regimes

The 25-year projection does not take into account current, planned and potential regulatory regimes that affect GHG emissions, including offsets and possible market mechanisms such as offset trading.

For example, the Greenhouse Gas Emission Control Regulation;

"...establishes the BC Carbon Registry and sets criteria for developing emission offsets issued by the Province. The regulation also establishes the price (\$25) for funded units issued under the act that would go towards a technology fund. Regulated operations, such as LNG operations, will purchase offsets from the market or funded units from government to meet emission limits."¹⁴

Future BC government regulations regulating GHG emissions may have an effect on the figures presented. Such regulations would include the Climate Leadership Plan that is currently underway.

The potential of "double counting" when considering life cycle emissions

The choice to consider upstream emissions for the Project raises questions as to how government may consider attributing emissions going forward. Care must be taken to avoid double counting of lifecycle GHG emissions throughout the value chain.

According to the GHG Protocols of the World Resources Institute,

Concern is often expressed that accounting for indirect emissions will lead to double counting when two different companies include the same emissions in their respective inventories. ... Whether or not double counting matters, depends on how the reported information is used.

¹⁴ As found at: <https://news.gov.bc.ca/releases/2015ENV0084-002116#>

Double counting needs to be avoided when compiling national (country) inventories under the Kyoto Protocol, but these are usually compiled via a top-down exercise using national economic data, rather than aggregation of bottom-up company data. Compliance regimes are more likely to focus on the "point of release" of emissions (i.e., direct emissions) and/or indirect emissions from use of electricity.¹⁵

As the data is being collected at the national level, and may have implications for consideration of cumulative effects and broader provincial and national GHG emissions targets, double counting needs to be avoided.

For example, the BC Greenhouse Gas Emission Reporting Regulation¹⁶ requires that industrial facilities with BC operations emitting 10,000 tonnes or more of carbon dioxide equivalent (CO₂e) per year must report their emissions to government annually. Major natural gas facilities, including compressor stations and the FortisBC and Spectra pipeline transmission networks are captured by this regulation. Although the Analysis does not name specific facilities and (given the nature of natural gas procurement by Woodfibre LNG) such facilities may never be effectively identified, it is highly likely that many of those facilities will be captured under the Greenhouse Gas Emission Reporting Regulation. Currently, the larger compressor stations and pipelines are captured by the reporting regulation.

As many of these upstream facilities are already reporting their GHG emissions, they will also fall under BC-based regulations regarding payment of carbon tax, offsets and any emerging market of carbon credits. Although some of these regulatory instruments remain to be implemented, there is likelihood that these changes will affect upstream GHG emissions in BC's natural gas sector.

Lack of consideration of downstream impact

The Analysis acknowledges that it does not consider downstream impacts or benefits, but it is difficult to reconcile attributing upstream impacts to a midstream operation while excluding downstream impacts. Considerable attention has been given to the potential benefit of displacing more GHG intensive fossil fuels in consumer jurisdictions such as China.

Given the possible effects of downstream LNG use, positive and negative, some agencies (US Department of Environment and the US National Environmental Policy Act) have begun to change the nature of their analysis.

¹⁵ World Resource Institute, The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard, Revised Edition, 2013, p. 32. As found at: <http://www.ghgprotocol.org/standards/corporate-standard>

¹⁶ As found here: <http://www2.gov.bc.ca/gov/content/environment/climate-change/stakeholder-support/reporting-regulation>

"...as the DOE and NEPA processes have begun to recognize, it is also important to consider both the upstream emissions of increased natural gas production and the downstream life cycle emissions from these LNG export projects in order to ensure the U.S. is contributing to the minimization of global net GHG emissions. This analysis can then serve as a basis for determining the social cost of carbon embodied in these U.S. exports, which affects both country level GHG emissions inventories and the potential for future domestic GHG reductions."¹⁷

For example, the same study reached the following conclusion:

By displacing coal, LNG saves 550 g CO₂-equiv per kWh of electricity and 20 g per MJ of heat. LNG saves GHGs under upstream fugitive emissions rates up to 9% and 5% for electricity and heating, respectively. GHG reductions were found if Russian pipeline natural gas was displaced for electricity and heating use regardless of GWP, as long as U.S. fugitive emission rates remain below the estimated 5-7% rate of Russian gas.¹⁸

This analysis is helpful in that it can provide direction in terms of effects and benefits of LNG exports with regards to GHG emissions. This report revealed that the fugitive emission rates of LNG exports were a critical factor in determining if exports were reducing GHG emissions by displacing other fuel sources.

Given the questions as to the applicability of the data in the Analysis, a more fulsome analysis of full life-cycle GHG emissions may be more helpful in determining future policy regarding LNG exports and related regulatory regimes.

Assumption on the behaviour of downstream consumer demand

The Analysis is based upon premise of additional GHG emissions. Such a consideration must presume that if the Project did not proceed, the LNG it may have supplied would not simply be replaced elsewhere. If Asian consumers were to fulfil purchasing requirements from alternative sources in other jurisdictions, the impact on climate remains. The additional GHG emissions associated with the Project only occur if one assumes that if the Project did not go ahead, the energy demand would not be filled elsewhere and would not be filled by alternative means. The more likely scenario is that customers in Asia not supplied by Canadian LNG facilities will either seek product from other jurisdictions or use alternative means of power generation, which could be

¹⁷ Abrahams, Leslie; Samara, Constantine; Griffin, Michael * Matthews, H. Scott; Life Cycle Greenhouse Gas Emissions From U.S. Liquefied Natural Gas Exports: Implications for End Uses, Department of Engineering and Public Policy and #Department of Civil and Environmental Engineering, Carnegie Mellon University; Environmental Science & Technology, 2015, 49, 3237-3245,

¹⁸ Ibid.

renewables but may just as likely be coal or other fossil fuels. As well, sourcing the required gas from other LNG facilities, that do not employ electric drives, may actually result in additional emissions.

This is the logic behind countries, such as Australia, embracing policies that attempt to mitigate GHG emissions, but protect trade-exposed industries. Environmental non-government organizations have also recognized that to simply over-regulate single jurisdictions, without considering the approaches taken by competing nations, simply displaces GHG emissions to other jurisdictions while harming domestic economic activity. For this reason, full life-cycle effects, including downstream, must be considered. Until the intention of the end consumer (importer) is understood, punitive regulation of the exporter simply shifts the issue to other, often less regulated, jurisdictions without having the desired effect of reducing GHG emissions.

The challenge of attempting to consider life cycle emissions when only considering upstream impacts and not considering downstream impacts. The unintended result of considering only upstream and not downstream emissions is that downstream overseas consumers (e.g., power plants) may be receiving offsets or credits for switching from coal to natural gas while at the same time upstream Canadian producers would be facing penalties (e.g., costs) for production and transportation of the same gas. British Columbia could find itself as a gas exporting province to be contributing to a global reduction of GHG emissions while receiving penalties for increased domestic GHG emissions.

Necessity to Provide Context

Although the Analysis provides potential upstream GHG emissions associated with the Project, it does not put these values into national or provincial context. Section 19(b) of the CEAA 2012 specifically states that the EA must take the significance of the environmental effects of a designated project. Without understanding the effect that the Project will have on national and provincial GHG emissions, it is difficult to understand the Project-related effects. For example, the Application demonstrated that the Project would result in a 0.23% increase in provincial GHG emissions and a 0.02% increase in Canadian GHG emissions.

Provision of sufficient information to verify the analysis

Woodfibre LNG would like to seek clarification on the source of some of the data and presented as it has not been able to verify the GHG emissions calculated in the Analysis.

Environment and Climate Change Canada determined rough estimates of upstream GHG emissions for the Project of 0.7 to 0.88 megatonnes CO₂e/year in addition to the 0.129 megatonnes CO₂e/year

estimated to be produced by the Project. Woodfibre LNG is unable to review the assumptions that were made in determining the upstream emissions estimate as links to references and an explanation of assumptions are not presented in the Analysis. No in-text citations are provided and tables of emissions factors presented in the Appendix included neither titles nor source information.

Examples of the style of the in-text references include "The emission forecast is determined based on GHG emission information in Canada's National GHG Inventory and projected production forecasts from the National Energy Board, which build in assumptions about natural gas supply mixes" (Page 4, 2016 ECCC). This sentence alone raises several questions that are not answered in the Analysis:

- Which inventory year is being referred to?
- Which forecasts from the National Energy Board?
- What assumptions are made in these documents?

While Woodfibre LNG has no reason to doubt the veracity of the figures cited, without the specific reference to source documents, Woodfibre LNG has not been able to verify the GHG emissions calculated in the Analysis.

Conclusion

In this response, Woodfibre LNG has addressed the Five Principles and how they have generally already been embraced by the proponent. Furthermore Woodfibre LNG has provided comment on the "Review of Related Upstream Greenhouse Gas (GHG) Emissions Estimates" document.

While helpful in considering GHG effects, Woodfibre LNG is of the view that the analysis is premised on a number of assumptions and data that are subject to change in certain circumstances.

In summary, the data should be considered with the following qualifications:

- assumes the source of gas is as indicated and this source remains static
- assumes there is incremental natural gas production resulting from the Project
- assumes that upstream players will not act or react to policy and technology changes
- does not fully anticipate the impact of current and impending regulatory and policy changes
- assumes behaviour downstream
- may include double counting
- should possibly consider possible impacts or benefits downstream

- should possibly consider the context of the Project-related GHG emissions

British Columbia's *Greenhouse Gas Industrial Reporting and Control Act* combined with new offset provisions and the BC Carbon Tax already create significant penalties and incentives for lowering GHG emissions - not to mention internal financial incentives related to controlling power costs and diminishing fugitive emissions at the facility. Beyond that, Woodfibre LNG is not a large enough consumer of natural gas to move upstream operators in a particular direction. Further improvements designed to reduce upstream emissions are likely to be driven by government policy or the actions of the upstream operators themselves.

Finally, it is worth noting, that of the Five Principles only upstream GHG emissions was not originally addressed by Woodfibre LNG. What makes this interesting is that this more "distant" impact was considered by Cooney in his deeper discussion of the meaning of proper social license. Cooney stated that he does not agree that "every issue should be on the table when social license discussions take place."¹⁹ Specifically Cooney argued that;

Provincial, national or international issues — greenhouse gas emissions, for example — are within the purview of senior governments because they potentially impact all citizens equally, regardless of whether they live near or far from a project under review. Thus, policies pertaining to these kinds of issues should be threshed out at the level of senior governments that have responsibility for all citizens who stand to be affected.²⁰

To Cooney's point, assessment of more global issues at the individual project level is a significant challenge.

Sincerely,
Woodfibre LNG Limited
<Original signed by>

Byng Giraud
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c.c.: Heather Smith, Canadian Environmental Assessment Agency
Dave Nikolejsin, BC Ministry of Natural Gas Development

¹⁹ Cayo.

²⁰ Ibid.