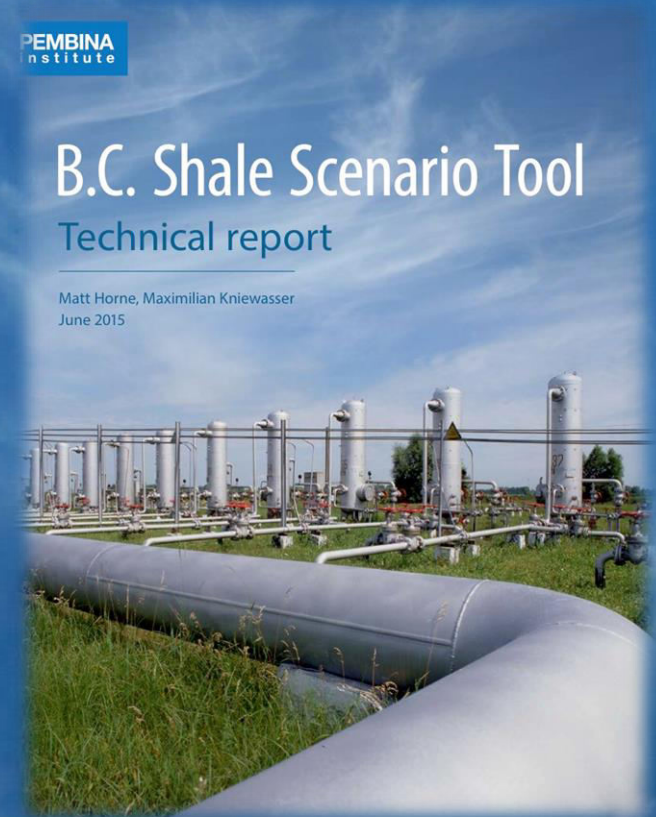


# LNG and shale gas

Choices for development  
and the implications for  
water resources in  
northeast B.C.

Matt Horne

Pembina Institute



# Leading Canada's transition to a clean energy future

The Pembina Institute is a national non-profit think tank that advances clean energy solutions through research, education, consulting and advocacy.



What could an LNG boom mean for water resources in northeast B.C.?











# Pembina's B.C. Shale Tool

Inputs

Step 1: Select amount of LNG development

☐ Option 1: LNG terminals
 ☒ Option 2: amount of LNG

Option 1: Select specific LNG terminals

Specify which LNG projects become online and at what date. Project capacities can be updated in the "Parameters + emission factors" tab

LNG Projects	Operational	Date online
LNG Canada stage 1	Select On/Off	Select year
LNG Canada stage 2	Select On/Off	Select year
Pacific NorthWest LNG st	Select On/Off	Select year
Pacific NorthWest LNG st	Select On/Off	Select year
Prince Rupert LNG	Select On/Off	Select year
Woodfibre	Select On/Off	Select year
Kitimat LNG	Select On/Off	Select year
Douglas Channel LNG	Select On/Off	Select year
WCC LNG Ltd.	Select On/Off	Select year
Aurora LNG	Select On/Off	Select year
Cedar LNG	Select On/Off	Select year
Orca LNG	Select On/Off	Select year
Grassy Point LNG	Select On/Off	Select year
NewTimes Energy Ltd.	Select On/Off	Select year
Canada Stewart Energy G	Select On/Off	Select year
Steelhead LNG	Select On/Off	Select year
Kitsault Energy Project	Select On/Off	Select year
Discovery LNG	Select On/Off	Select year
Wespac	Select On/Off	Select year
Tinton LNG	Select On/Off	Select year

Option 2: Select an amount of LNG export

Specify the amount of new LNG coming online in that year. **Note: The large LNG proposals in the northwest range from 10 to 30 million tonnes per annum (mtpa).**

Year	New LNG (mtpa)	Total LNG (mtpa)
2016		0
2017		0
2018		0
2019		0
2020		0
2021		0
2022	12	12
2023		12
2024		12
2025		12
2026		12
2027		12
2028		12
2029		12
2030		12
2031		12
2032		12

Option 2: Option 2 continued

Year	New LNG (mtpa)	Total LNG (mtpa)
2033		12
2034		12
2035		12
2036		12
2037		12
2038		12
2039		12
2040		12
2041		12
2042		12
2043		12
2044		12
2045		12
2046		12
2047		12
2048		12
2049		12
2050		12

Step 2: Select amount of Non-LNG natural gas development

☒ Option 1: Amount of Non-LNG gas produced
 ☐ Option 2: Non-LNG gas development (% relative to 2013)

Option 1: Amount of Non-LNG sales gas produced

Note: In 2014, BC produced 42,446 million m<sup>3</sup>

Year	Amount of sales gas in million m <sup>3</sup>
2020	42,446
2025	42,446
2030	42,446
2035	42,446
2040	42,446
2045	42,446
2050	42,446

Option 2: Non-LNG gas development (% change relative to 2013)

How do BC consumption levels and exports to other North American jurisdictions change from a 2013 reference level

Year	% change to B.C. consumption NA exports
2020	0%
2025	0%
2030	0%
2035	0%
2040	0%
2045	0%
2050	0%

Welcome

Simple scenario analysis

Water analysis

Input

Summary + scenario comparison

Numbers in context

Environmental pricing

Methane sensitivity

PEMBINA  
institute

# What the tool is and isn't

**Is:** Tool to help understand the environmental impacts from different levels of LNG and shale gas development, and different levels of environmental policy.

**Isn't:** Predictive model of how much LNG or shale gas development will proceed.



# Inputs and outputs

## Inputs

Amount of LNG and shale gas demand

Location that the gas comes from

Strength of environmental policies

## Outputs

Gas wells

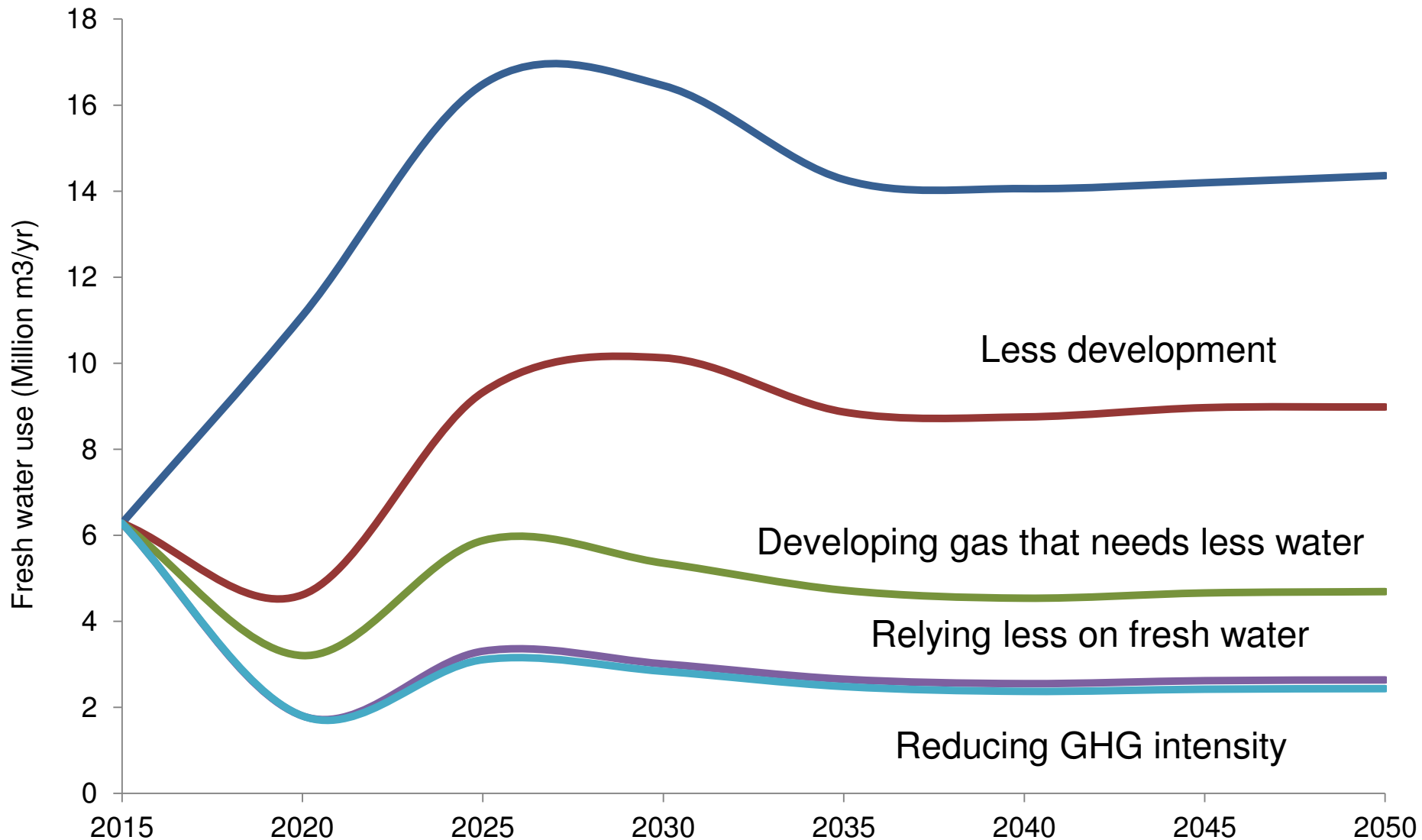
Carbon pollution

Water use

Wastewater



# Fresh water use for fracking



# Conclusions

- An LNG boom could have significant implications for water resources in northeast B.C.
- Choices about the scale of development, location of development, and approach to development are all important factors.
- The earlier we understand and discuss options, the more flexibility we have

Matt Horne, B.C. Associate Director  
[matth@pembina.org](mailto:matth@pembina.org) | [@hornematt](https://twitter.com/hornematt)

Download the B.C. shale planning tool:  
[www.pembina.org/pub/BCShaleTool](http://www.pembina.org/pub/BCShaleTool)

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