



CANADIAN LNG EXPORTS
MULTI-STAKEHOLDER COLLABORATION INITIATIVE 2014
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TIMESCALES FOR CANADIAN LNG EXPORT TERMINALS

FORECASTING PROJECTED
TIMESCALES FOR THE BUILD
OUT OF CANADIAN LNG EXPORT
TERMINALS TO DETERMINE
WHEN THE FIRST EXPORTS
WILL BE SHIPPED

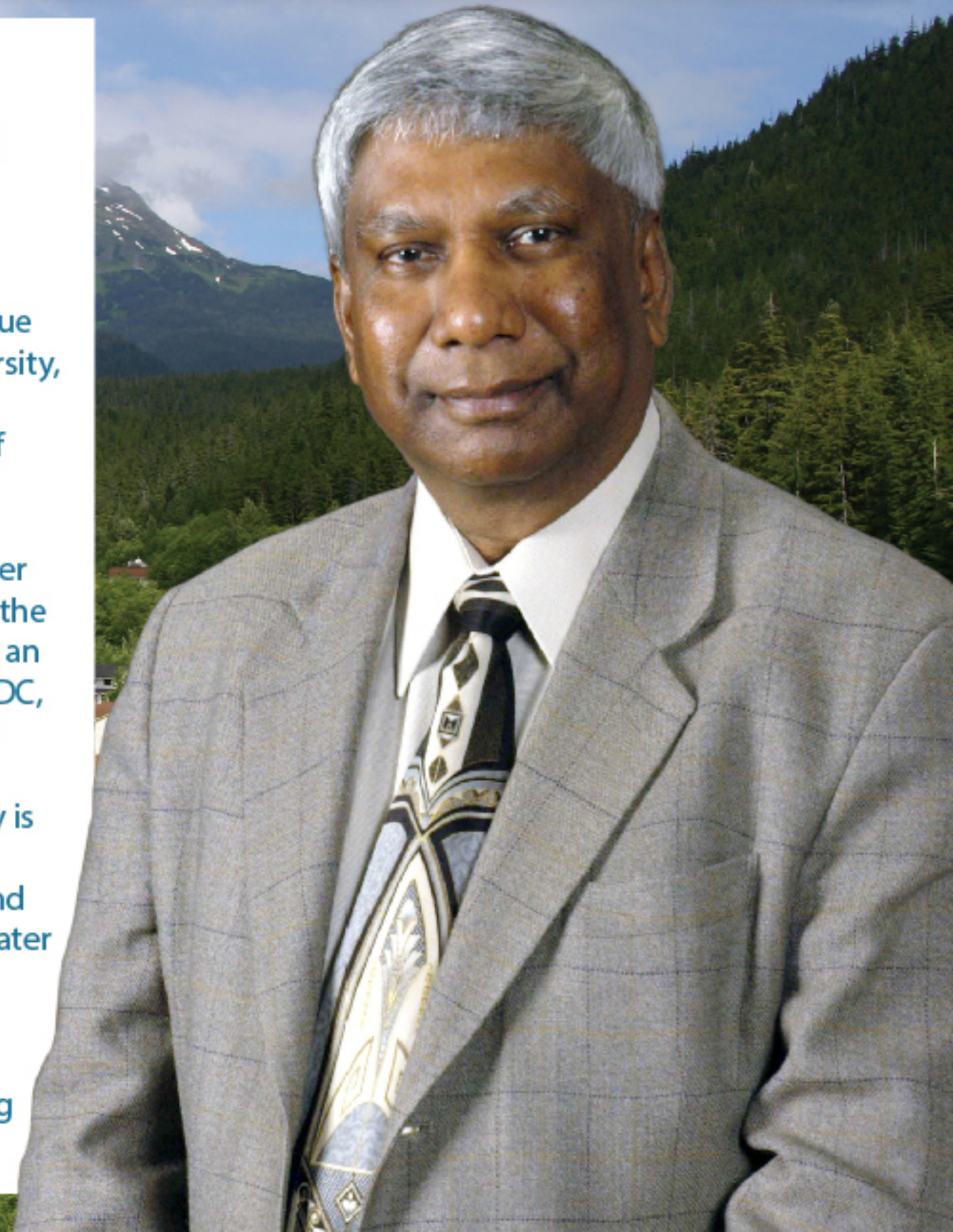
KRISHNAN SUTHANTHIRAN
FOUNDER & PRESIDENT, KITSAULT ENERGY





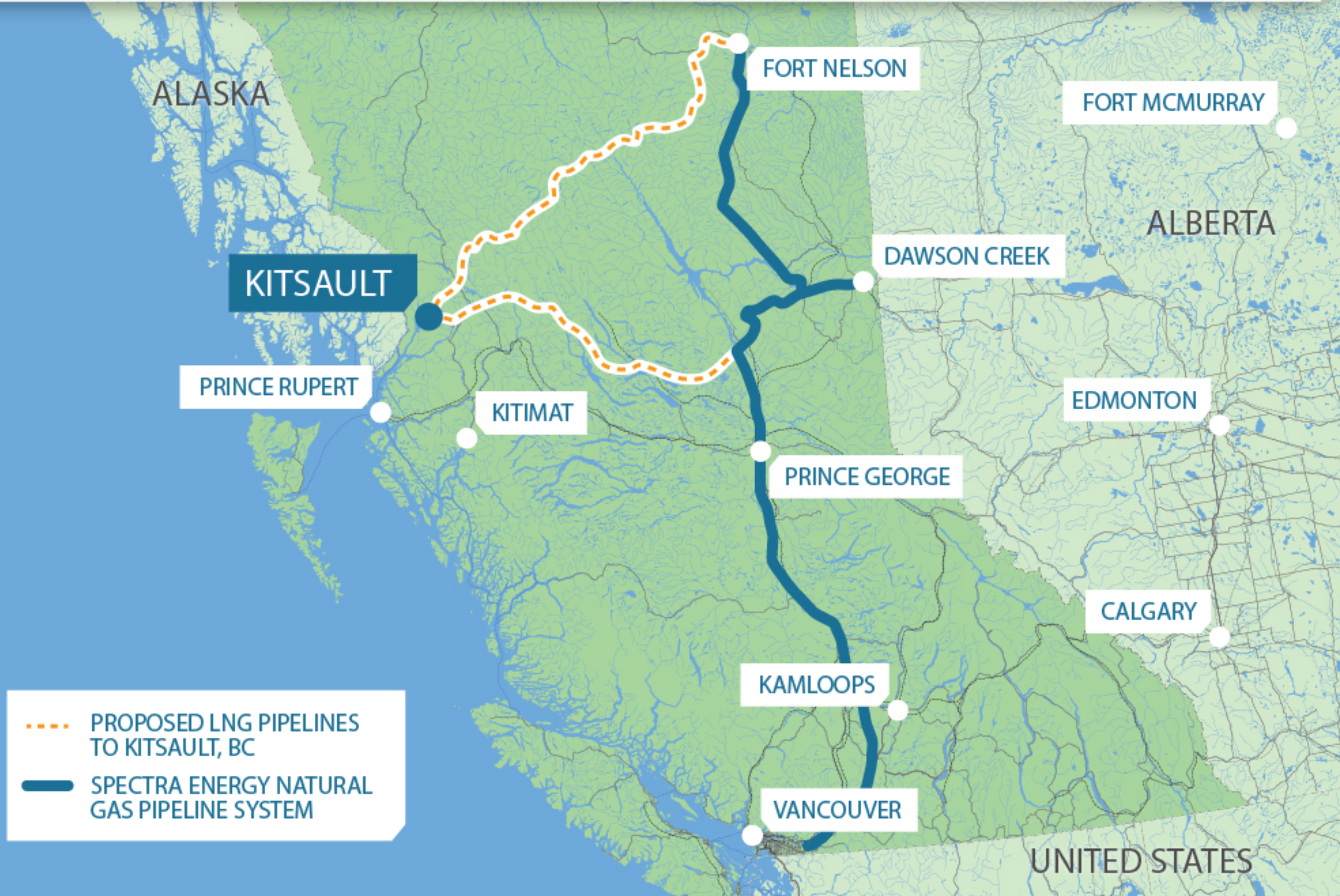
ABOUT KRISHNAN SUTHANTHIRAN FOUNDER & PRESIDENT OF KITSAULT ENERGY AND TEAMBEST COMPANIES

Krishnan Suthanthiran immigrated to Canada from India in September 1969 after graduating with a Bachelor's Degree in Mechanical Engineering from University of Madras, India, to pursue his Master's Degree in Mechanical Engineering at Carleton University, Ottawa, Ontario, Canada. He arrived with a total of 400 Canadian Dollars. Subsequently, he received a National Research Council of Canada Research Assistantship, and graduated with a Master's Degree in 1971. Having lost his father to cancer while he was an undergraduate student in engineering, he has dedicated his career to cancer prevention, early detection and effective treatment for the Total Cure. He moved to the United States in 1972 and worked as an Engineer Physicist at Howard University Hospital in Washington, DC, USA until 1978. Since then he has founded and invested globally many millions of USD in medical, real estate, construction, entertainment, and energy companies. He founded and currently is supporting a few non-profit charitable foundations to promote quality education and healthcare and making them affordable and accessible. He is pursuing a goal of providing purified drinking water and affordable sewer systems in every part of the world. He has contributed substantially to setting up endowed chair and endowments for scholarships. Also, he has provided significant funding to support medical research and treatment by partnering with academic centers, national labs, and hospitals globally.



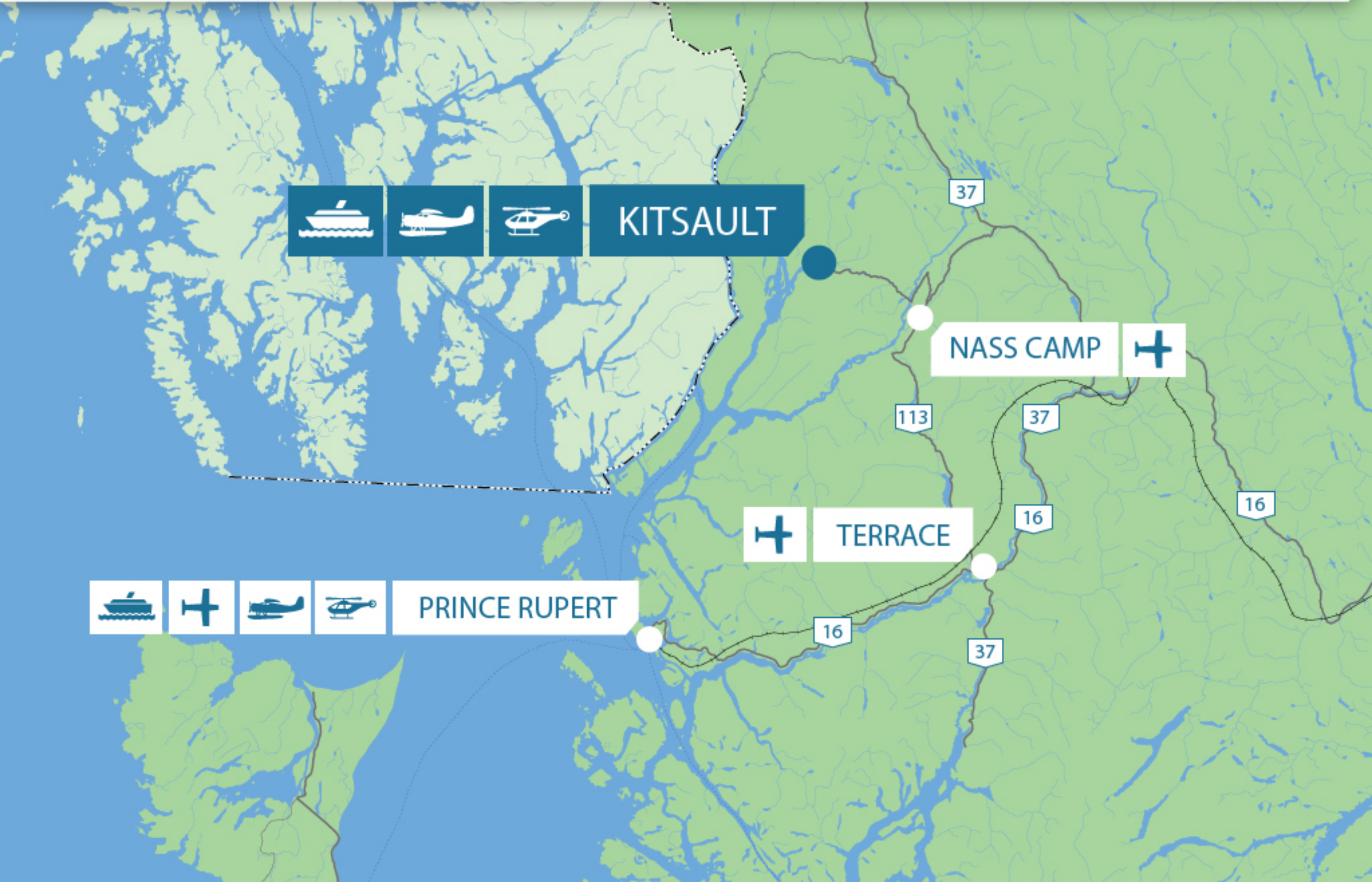


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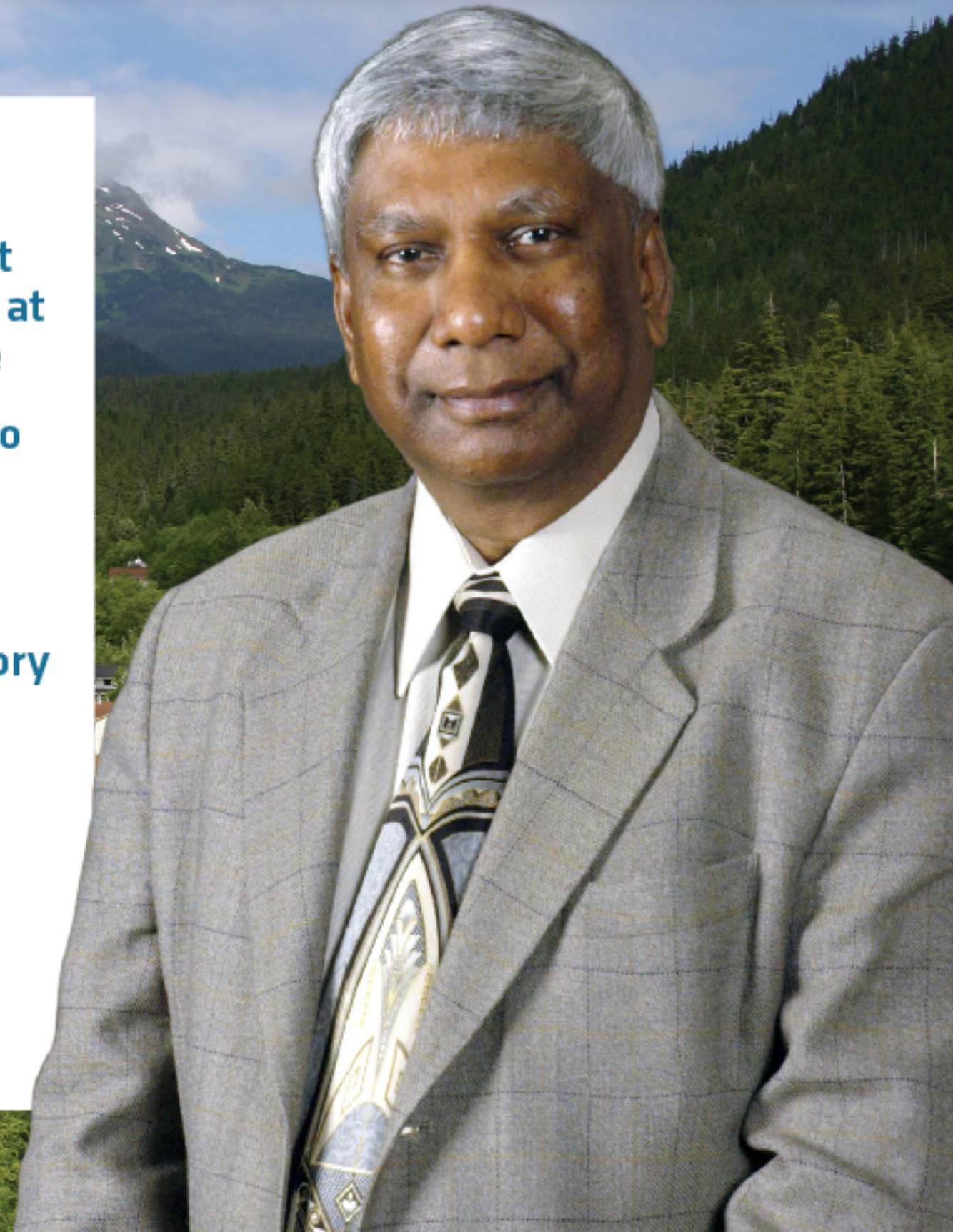
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OUTLINE

1. Clarifying what stage of progression current LNG export terminal projects in Canada are at and when they are expected to come online
2. Determining by what date terminals need to come on stream to avoid falling too far behind projects in the U.S., Australia and Qatar
3. Identifying the key environmental, regulatory and economical hurdles that LNG terminal developers in Canada are facing and what other stakeholders can do help them overcome these hurdles
4. Gaining terminal developer perspectives on whether pipelines transporting natural gas to their facilities will be ready on time





Stages of progression current LNG export terminal projects in Canada

- There are multiple projects in Canada, with 14 or so LNG Export License applications approved or under review
- None of these projects has reached Final Investment Decision, although one or two are expected this year
- The projects need to ascertain the economics of their project, including the Provinces anticipated final decision on the LNG Tax
- It is expected that the first LNG will be exported in 2018, with a number of projects following thereafter



SUMMARY OF PROJECTS

Kitsault Energy (2018)

- Floating LNG Facility with existing housing, infrastructure
- Applied for 20 years export license

Douglas Channel LNG (2015+)

- Floating Liquefaction facility
- BC LNG Export Cooperative, Haisla Nation, LNG Partners

Kitimat LNG (2016)

- Land based liquefaction, storage and loading facilities
- Chevron, Apache Canada

LNG Canada (2018)

- Land based Export terminal
- Shell Canada Ltd., Korea Gas Corporation(KOGAS), Mitsubishi Corporation and PetroChina Company Limited

Triton LNG (2017)

- AltaGas Ltd, Idemitsu Kosan
- Feasibility study on liquefaction plant on FLNG

Prince Rupert LNG (~2022)

- LNG facility
- BG group PLC, Prince Rupert Port Authority, Spectra Energy

Pacific Northwest LNG (2018)

- Two train export facility
- Petronas, Japex, Petroleum Brunei, Indian Oil Corp

WCC LNG

- Export License approved but no location has been secured
- Imperial Oil, Exxon Mobil

(CONTINUED)



SUMMARY OF PROJECTS (CONTINUED)

Aurora (2021)

- Applied for 25 years export license
- Nexen(CNOOC), INPEX, JGC Corporation

Stewart Energy LNG (2017)

- Floating and land based facilities 300 km north of Prince Rupert
- Canada Stewart Energy Group Ltd

Woodfibre LNG (2017)

- Small-scale LNG processing and export facility at a former pulp mill
- Pacific Oil & Gas

Woodside Petroleum

- LNG Terminal at the south side of Grassy Point, Kitimat

Steelhead LNG

- LNG Terminal



Stage of Progression for Kitsault Energy

- Infrastructure and housing already in place
- Currently in discussion with partners and open to any further dialogue



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KITSAULT, BC



EXISTING HOUSING INFRASTRUCTURE:

SINGLE FAMILY HOMES

- 95 THREE BEDROOM HOMES AVAILABLE.

APARTMENT BUILDINGS

- 150 TWO AND THREE BEDROOM APARTMENTS AVAILABLE.

FUTURE DEVELOPMENT

- 30 BUILDING FOUNDATIONS ALREADY IN PLACE.
- VACANT LAND THE POTENTIAL DEVELOPMENT OF PRIME OCEAN AND MOUNTAIN VIEW LOTS.





COMMUNITY INFRASTRUCTURE:

RECREATION CENTRES

- THE 25,000 SQUARE FOOT COMMUNITY CENTRE.
- FOUR SHEET CURLING RINK, MOVIE THEATRE AND A PUB.

SHOPPING CENTRE

- 22,000 SQUARE FOOT SHOPPING CENTRE WITH A GROCERY STORE, BANK, AND POST OFFICE

EXECUTIVE HOUSE

- VIP GUEST HOUSE WITH 4 BEDROOMS, 5 BATHROOMS AND A BOARDROOM.

MEDICAL CENTRE

FIRE HALL

INDUSTRIAL BUILDINGS





Determining by what date terminals need to come on stream

- Canada needs to move quickly and secure long-term supplies with Asian countries.
- Competition is high: Presently there are 18 exporting countries and 25 importing countries spread worldwide, with many more aspiring to enter the market.
 - Global natural gas production has increased by 3.1%.
 - US (+ 7.7%)
 - Qatar (+25.8 %)
 - Russia (+3.1%)
 - Turkmenistan (+40.6%)



Key environmental, regulatory and economical hurdles that LNG terminal developers in Canada are facing and what other stakeholders can do help them overcome these hurdles

- **Acquiring sufficient feedstock**
- **BC must clarify long term LNG tax rates to help companies solidify their plans and to attract investors.**
 - **LNG Developers seeking certainty for long term fiscal policy**
- **Consideration of First Nations is not only important but vital (social license)**

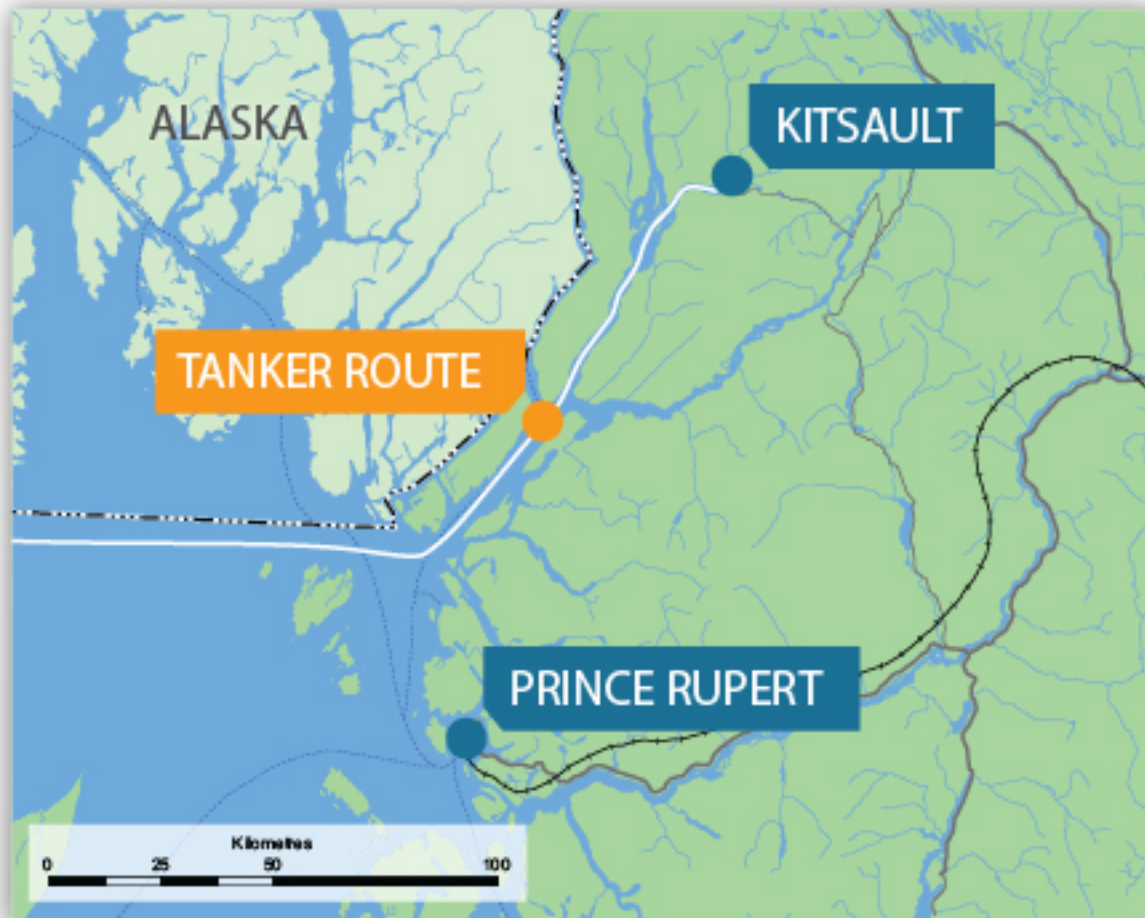


(CONTINUED) Key environmental, regulatory and economical hurdles that LNG terminal developers in Canada are facing and what other stakeholders can do help them overcome these hurdles

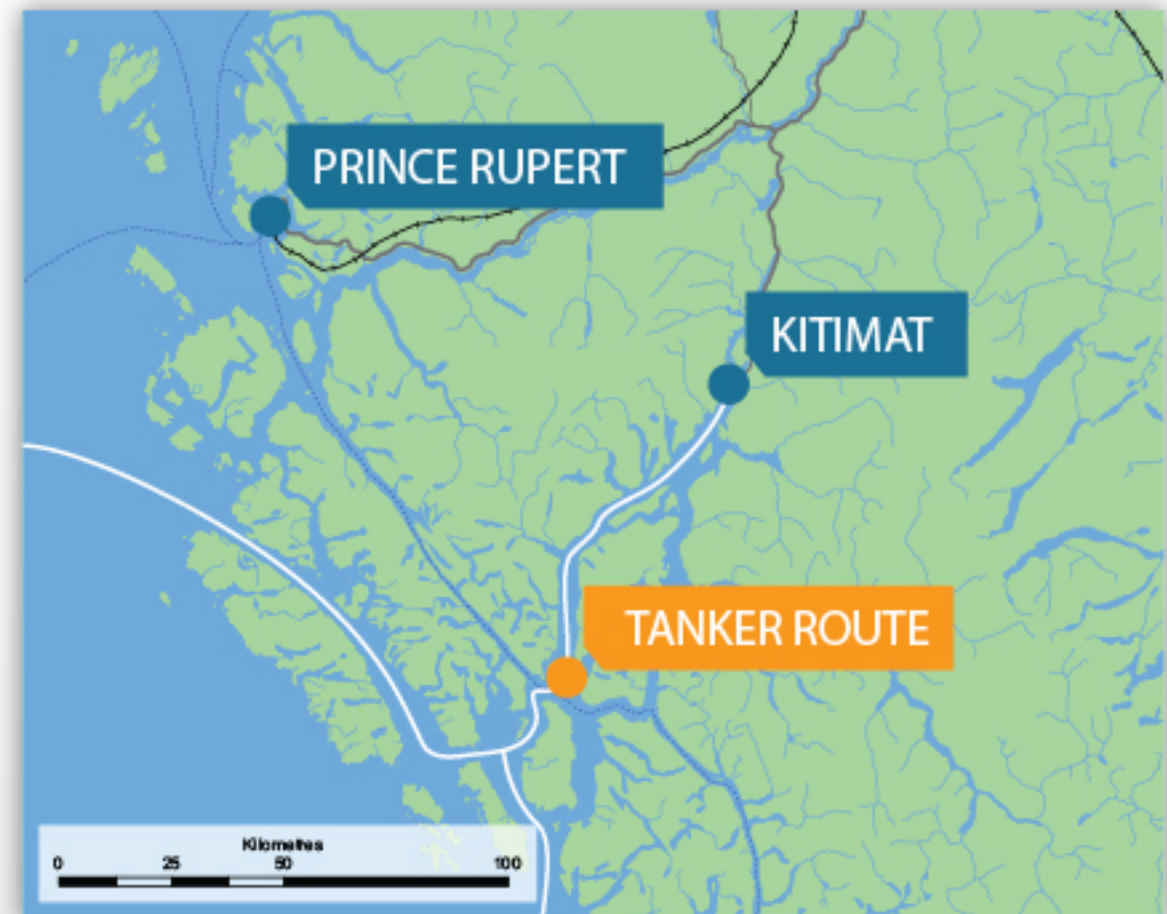
- **Adoption of natural gas in other industries in Canada, such as transportation and manufacturing**
- **Canada needs robust labour pools with highly skilled talent.**
- **Need for housing and infrastructure**
- **Congestion at current ports if many projects get approved in the same area**

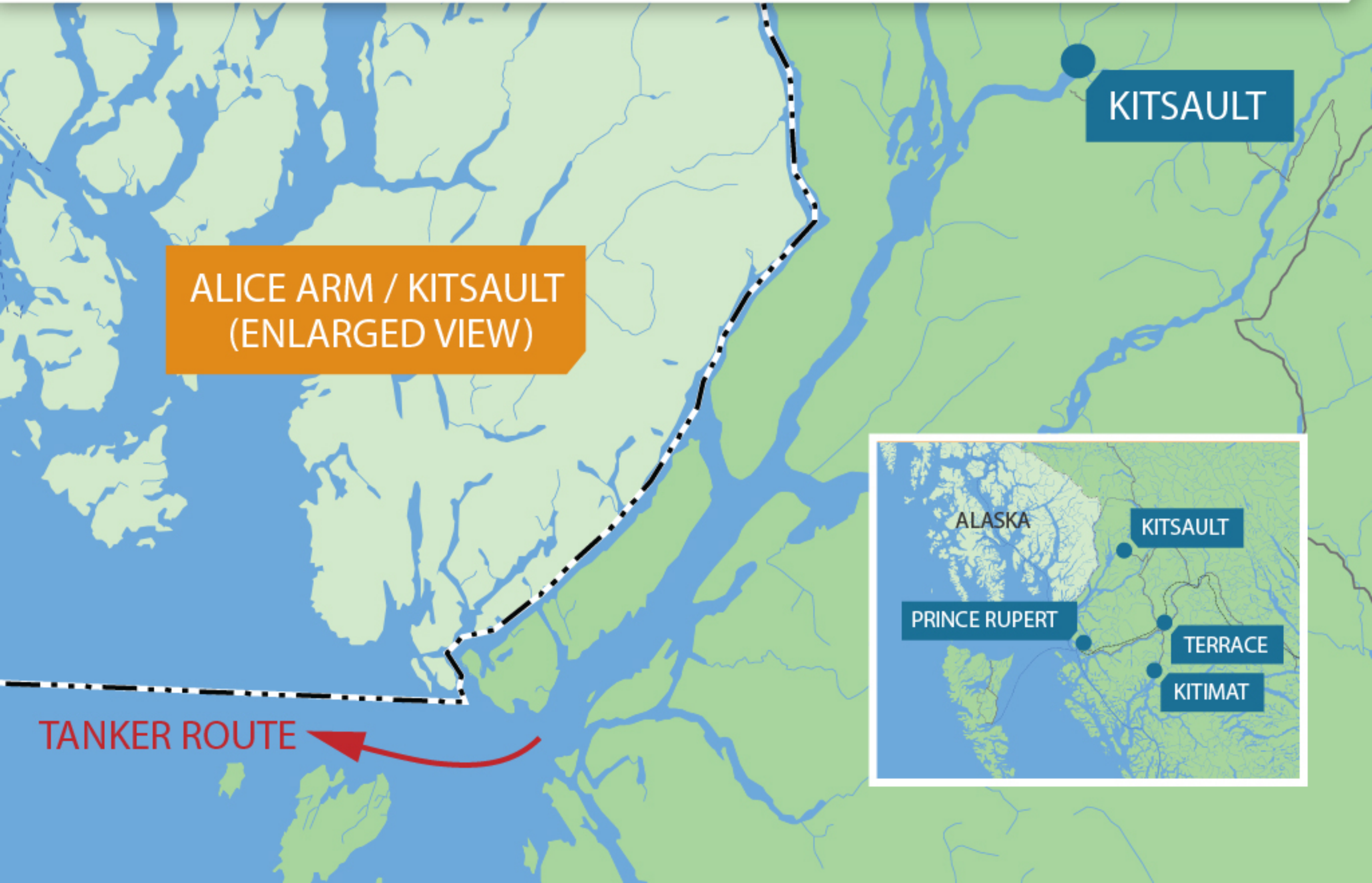


ALICE ARM / KITSAULT



DOUGLAS CHANNEL TANKER ROUTE





ALICE ARM / KITSAULT
(ENLARGED VIEW)

KITSAULT

TANKER ROUTE

ALASKA

KITSAULT

PRINCE RUPERT

TERRACE

KITIMAT



Perspectives on whether pipelines transporting natural gas to their facilities will be ready on time

- **Many of the BC LNG Export projects are really “pipeline projects”, that is, getting the gas to the coast.**
- **Must work collaboratively with First Nations and with the provincial and federal governments to speed up the development and export of LNG.**



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