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THE 20TH INTERNATIONAL CONFERENCE & EXHIBITION ON LIQUEFIED NATURAL GAS

LNG2023

10-13 JULY 2023, VANCOUVER, CANADA

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Showcasing Canada's clean LNG

P. 13 NATURAL GAS CAN FUEL THE ENERGY TRANSITION

P. 19 NET-ZERO LNG IS A REALISTIC GOAL

P. 21 EUROPE TODAY, ASIA TOMORROW - THE FUTURE OF LNG DEMAND

P. 23 INDUSTRY COMPETITION KEY TO TACKLING METHANE EMISSIONS

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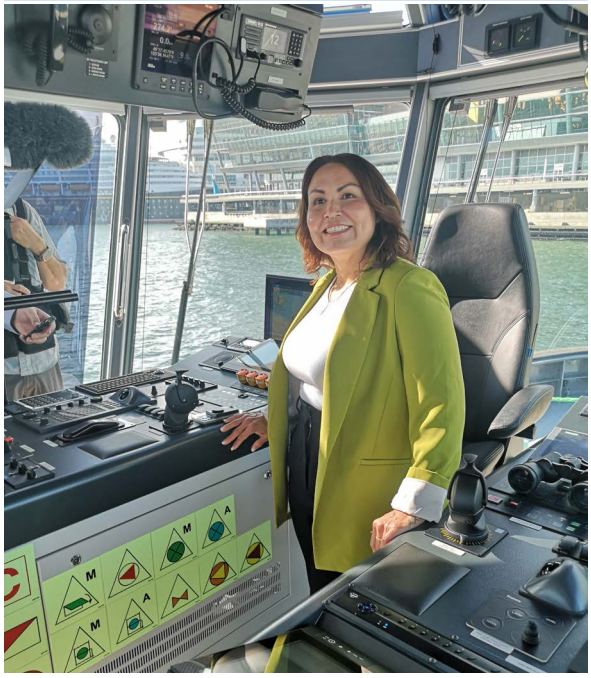

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Event overview



We extend a warm welcome to all attendees of LNG2023! It was a pleasure to have you with us yesterday, and we hope you had a fulfilling and informative day discussing and recognising the importance of LNG in shaping the global energy landscape.

Today promises to be even more captivating as we unveil a plethora of exciting Plenaries, Leadership Dialogues, Spotlight Sessions, Paper Presentations, and our Discovery Live Hub sessions. Enjoy unrivalled networking opportunities with like-minded business peers across the day and don't forget to experience the very latest innovative LNG technologies on the exhibition floor.

As the world progresses towards net zero, get ready to dive deeper into the industry's latest developments and advancements, and make the most of your time at LNG2023.

Discover. Connect. Do Business.

LNG2023 EVENT APP

Get the most out of LNG2023 by creating your event schedule and start booking 1:1 appointments with other delegates via the official app.

Brought to you by our Global Sponsors Cheniere and Tellurian, the App is exclusive to Conference Delegates and Exhibition Registrants and contains the very latest programme.



Download on the App Store

GET IT ON Google Play

HOW TO DOWNLOAD

Download the Cvent app to your phone from Play Store or App Store or use the QR codes below:

HOW TO LOG IN:

1. Open Cvent app and search for ''LNG2023'' event
2. Log in using your first name, last name and email address you used to register for the show.
3. To verify your account, you will need to enter a code sent to your email (please check your SPAM folder) or mobile.

ONCE LOGGED IN

Depending on your registration type you will have access to different features e.g. floor plans, full programme, speaker bios, exhibitor list as well as creating your own personalised schedule for the show.

APP FEATURES AVAILABLE TO ALL ATTENDEES:

- Event information
- LNG2023 Daily News

APP BENEFITS FOR CONFERENCE DELEGATES

- View attendee list
- Message fellow attendees
- Schedule meetings
- Manage your schedule
- View speaker profiles, papers and posters

APP HELPDESK

If you require help or advice with regards to the App, please speak to our staff at the App Helpdesk located at the main event registration on West Level 1, City Foyer – West Building or email info@lng2023.org.

Sponsored by:

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TELLURIAN

Tuesday's programme highlights

LNG2023 Keynote address



Kickstarting the day, Honourable Randy Boissonault, Minister of Tourism & Associate Minister of Finance for the Government of Canada, will deliver a highly anticipated keynote session at LNG2023. With his expertise in both finance and tourism, Minister Boissonault brings a unique perspective to the critical role of LNG in Canada's economy and its potential impact on the tourism industry. His speech is eagerly awaited by industry leaders and attendees alike.

Join us this morning:
Date: Tuesday 11 July 2023
Time: 10:30 – 10:45
Location: East Exhibition Hall A

Leadership Dialogue with H.E. Saad Sherida al-Kaabi Minister of Energy, Qatar; President and CEO, QatarEnergy

QatarEnergy is at the center of the global energy conversation as it fortifies its position as the world's largest LNG producer with capacity expansions that will reach 126 million tons per annum and a historic ship-building campaign for as many as 100 state of the art LNG vessels to cater for that capacity. H.E. Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs, the President & CEO of QatarEnergy will provide his perspective on the current energy landscape with LNG being at the forefront of the energy transition. This one-on-one conversation will set the scene for the day's conference agenda.



Date: Tuesday 11 July 2023
Time: 10:45 – 11:00
Location: East Exhibition Hall A

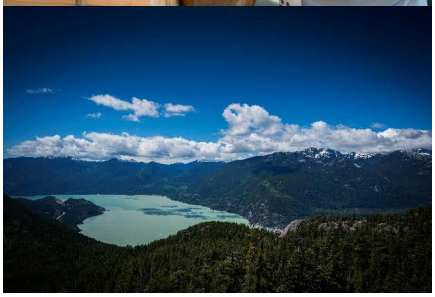
Discovery Hub Live

The Discovery Hub is the home to 40+ specialist papers selected by the Programme Committee as requiring more discussion with a more selective audience around an interactive poster. These will be available throughout the event, with the possibility for delegates to engage with the speaker either by appointment via the App or at the "Discovery Hub Live" event.
It is an opportunity to meet the posters' authors, ask questions and dive deeper into the topics presented. Attendees can use this one-on-one time with presenters to learn more and talk through the implications of the presented work.

Date: Tuesday 11 July 2023
Time: 16:45 – 17:45
Location: West Exhibition Level 1
See the interactive posters here.

The exhibition floor





Join Woodfibre LNG daily to experience and learn from local Indigenous Sḵwx-wú7mesh Úxwumixw (Squamish Nation) artists as they demonstrate traditional carving and blanket weaving. Check back each day to see the progress and finished creations. Woodfibre LNG is the first industrial project in Canada to recognize a non-Treaty Indigenous government, Squamish Nation, as a full project regulator. Before construction starts in September, Woodfibre LNG invites you to experience and interact with immersive virtual reality and a flyover over their facility, located southwest of Squamish in British Columbia. All this is happening at stand B401in the West Ballroom, level 1. For more information about the Project visit www.woodfibrelng.ca

Woodfibre LNG

For the full programme, remember to download the LNG2023 Event App and manage your programme schedule through the app.

Programme at a Glance

SUNDAY
9 JULY

07:00 - 16:30
REGISTRATION

14:00 - 17:30
Training Sessions

17:30 - 19:00
Arrival Cocktails
West Level 2, Ocean Foyer and Terrace

LNG2023 VANCOUVER 10-13 JULY

LEGEND

- **Plenary, Leadership Dialogue, Keynotes, Ceremonies**
  East Exhibition Hall A
- **Registration**
  West Level 1
- **Training Sessions**
  West Level 3
- **Networking Break / Lunch**
  East Ballroom A & B
  West Level 1 & 2
- **Functions**
  Arrival Cocktails
  West Level 2,
  Ocean Foyer and Terrace
  Welcome Reception
  East Exhibition Hall A
  LNG2026 Welcome with QatarEnergy
  West Level 1, Ballroom Foyer
  LNG2023 Networking Reception
  West Level 1, Ballroom Foyer
- **Spring Sessions**
  West Level 1, Rooms 118-120
- **Summer Sessions**
  West Level 1, Rooms 121-122
- **Autumn Sessions**
  West Level 2, Rooms 211-214
- **Winter Sessions**
  West Level 2, Rooms 220-222

MONDAY
10 JULY

07:00 - 16:30
REGISTRATION

09:30
Exhibition Open

09:30 - 10:00
Networking Break

10:00 - 11:00
Opening Ceremony

11:00 - 11:15
LD.01 Leadership Dialogue with Jason Klein, CEO - LNG Canada

11:15 - 12:15
PL.01
The Effect of Geopolitical Risk and Market Volatility on LNG Commercial Activity

12:15 - 13:30
Networking Lunch

13:30 - 14:30
Spotlight Sessions
SL.03 Measuring Up...
SL.01 Financing the Next...
SL.02 Role in Europe's...
SL.04 Innovation in LNG...

14:30 - 15:00
Networking Break

15:00 - 16:30
Paper Presentations
PP.03 Liquefaction...
PP.01 Commercial Trends...
PP.02 Current Dynamics...
PP.04 Innovations in LNG..

17:30
Exhibition Close

18:00 - 19:30
Welcome Reception

TUESDAY
11 JULY

07:00 - 16:30
REGISTRATION

07:30 - 08.00
Networking Break

08:00 - 09:15
PP.05 FLNG and LNG...

09:30
Exhibition Open

09:30 - 09:45
Keynote Address

09:45 - 10:00
LD.02 Leadership Dialogue with H.E. Minister of Energy, Qatar; President and CEO, QatarEnergy

10:00 - 11:00
PL.02
Challenges of a Turbulent Energy Transition

11:00 - 11:30
Networking Break

11:30 - 12:30
PL.03
LNG's Role in the Energy Trilemma

12:30 - 13:45
Networking Lunch

13:45 - 14:45
Spotlight Sessions
SL.06 Natural Gas...
SL.08 The Regulatory...
SL.07 Reconciliation...
SL.05 Forecast & Appetite...

14:45 - 15:15
Networking Break

15:15 - 16:45
Paper Presentations and Forums
F.02 Repurposing LNG...
F.03 Advances in Safe...
F.01 Global LNG Trade...
PP.06 Canadian LNG:..

16:45 - 17:45
Discovery Hub Live

17:30
Exhibition Close

WEDNESDAY
12 JULY

07:30 - 16:30
REGISTRATION

08:30 - 09:00
Networking Break

09:30
Exhibition Open

09:00 - 09:15
LD.03 Leadership Dialogue with Madam Li Yalan, President, International Gas Union

09:15 - 10:15
PL.04
Growth of LNG through Innovative Partnerships and Cooperation

10:15 - 11:15
PL.05
Fuelling the LNG Innovation Agenda

11:15 - 11:45
Networking Break

11:45 - 13:15
Paper Presentations and Forums
PP.09 Solutions for...
PP.08 Advances in LNG...
F.04 Decarbonisatio...
PP.07 Digital Twin Case...

13:15 - 14:30
Networking Lunch

14:30 - 15:30
Spotlight Sessions
SL.10 Interrelationship...
SL.09 Presentation of...
SL.11 Enabling...
SL.12 Increasing...

15:30 - 16:00
Networking Break

16:00 - 17:30
Paper Presentations
PP.13 Challenges of...
PP.11 Regional Reports...
PP.12 Import Terminal...
PP.10 Best Practices...

17:30
Exhibition Close

17:45 - 18:15
LNG2026 Welcome with QatarEnergy

18:15 - 19:15
LNG2023 Networking Reception

THURSDAY
13 JULY

07:30 - 15:00
REGISTRATION

07:30 - 08.00
Networking Break

08:00 - 09:15
PP.14
Innovation in Liquefaction...
PP.15
Development in LNG...

09:30
Exhibition Open

09:15 - 10:15
Spotlight Sessions
SL.16 Small and Micro...
SL.13 The Role of LNG...
SL.15 Market and...
SL.14 Progress in...

10:15 - 10:45
Networking Break

10:45 - 12:15
Paper Presentations and Forums
PP.18 New Approaches...
PP.16 Measuring and...
F.05 Evolution...
PP.17 Downstream...

12:15 - 13:15
PL.06
LNG2023 Conclusions and Looking Towards LNG2026

13:15 - 13:45
Closing Ceremony

13:45 - 14:45
Networking Lunch
Lunchbox Collection

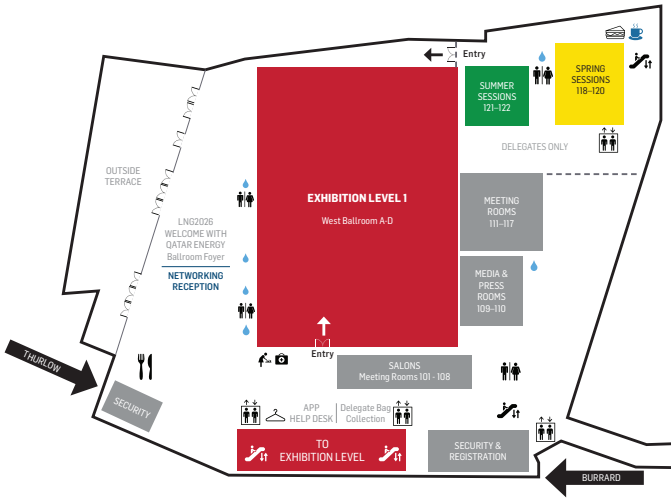
14:00
Exhibition Close

For the full programme, remember to download the LNG2023 Event App and manage your programme schedule through the app.

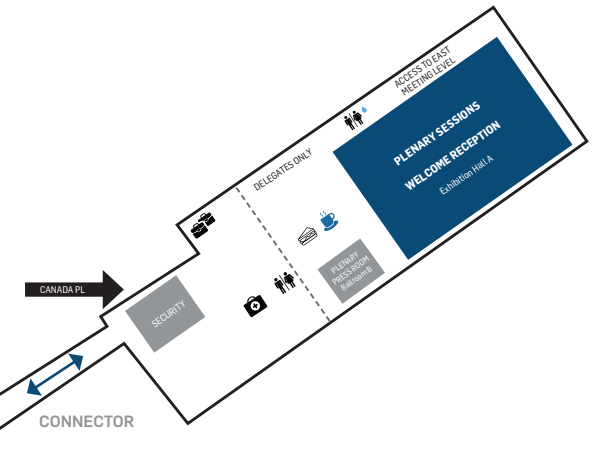
LNG2023 floorplan

LEGEND:

- **Water Fountains** — SPONSORED BY TELLURIAN
- **Bistro**
- **Conference Delegate Networking Break** — SPONSORED BY SEMPRA INFRASTRUCTURE
- **Conference Delegate Networking Lunch**
- **Cloakroom**
- **Luggage Room** Open Thursday, 13 July only
- **Male & Female Prayer Room**
- **Charging Station**
- **Mothers Room**
- **First Aid**
- **Toilet**
- **Lift**
- **Escalator**



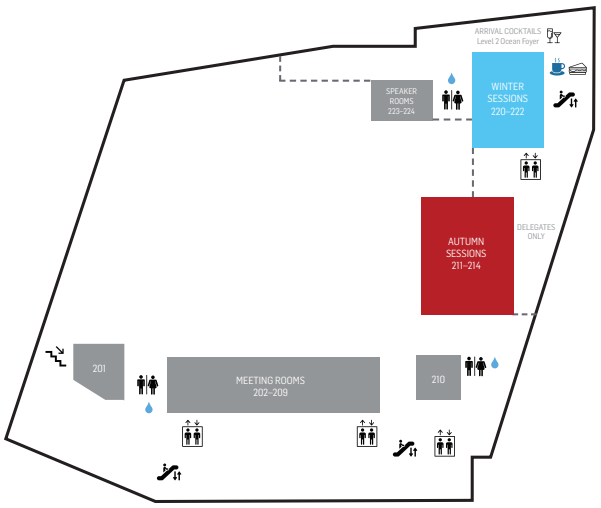
WEST LEVEL 1



EAST LEVEL 1



WEST EXHIBITION LEVEL



WEST LEVEL 2

Monday's highlights

The atmosphere at LNG2023 was truly remarkable yesterday. We saw key stakeholders, industry leaders, experts, and enthusiasts from around the globe embodying the spirit of collaboration, knowledge sharing, and excitement for the future of LNG. The conference sessions were brimming with insightful discussions, thought-provoking presentations, and cutting-edge advancements in the LNG sector. Attendees engaged in lively debates, exchanging ideas, and exploring innovative solutions to meet the growing demand for cleaner energy. Meanwhile, the exhibition floor dazzled visitors with impressive cutting-edge technologies and showcasing the entire spectrum of the LNG value chain including producers, buyers, EPCs, solutions providers and related industries.













Tomorrow's highlights



LEADERSHIP DIALOGUE WITH MADAM LI YALAN PRESIDENT INTERNATIONAL GAS UNION

The mission of IGU is to advocate gas as an integral part of a sustainable global energy system and to promote the gas industry's political, technical and economic progress. There are more than 150 members of IGU are associations and corporations of the gas industry representing over 90% of the global gas market. The working organization of IGU covers the entire value gas chain from exploration and production, transmission via pipelines and liquefied natural gas (LNG), and distribution and combustion of gas at the point of use. Hear from Madam Li Yalan at:

Date: Wednesday 12 July 2023
Time: 09.00 – 09.15
Location: East Exhibition Hall A

THE IGU'S WORLD LNG REPORT 2023

The International Gas Union (IGU) will unveil the highly anticipated World LNG Report 2023 in tomorrow's Spotlight Session. Packed with comprehensive data and insightful analysis, this report offers a comprehensive overview of the global LNG market.

Time: 14.30 – 15.30
Location: West Level 1, Rooms 121-122 l Summer Sessions
For the latest IGU's reports, please visit www.igu.org

LNG2023 WELCOME WITH QATARENERGY

Don't miss this reception hosted by QatarEnergy. It will take you on a journey to the upcoming host country, Qatar. Join us for an evening with traditional food, dance performances and a sneak peek at what's to come at LNG2026.
Time: 17.45 – 18.15
Location: West Level 1, Ballroom Foyer
Sponsored by:

قطر للطاقة
QatarEnergy

LNG2023 NETWORKING RECEPTION

Take advantage of tomorrow's final networking evening at LNG2023 and connect with industry peers, exchange contact information and strengthen the relationships built over the course of the week.

Time: 18:15– 19.15
Location: West Level 1, Ballroom Foyer



Around Vancouver



There's something special about Vancouver that will inspire you to see things differently. And you'll feel it as soon as you arrive. Maybe it's the snow-capped mountains, the urban rainforest, or the reflection of the pacific ocean on the cosmopolitan skyline - whatever it is, it inspires those who come here to leave with a totally different perspective than the one they arrived with.

If you are looking for places to unwind and explore during the event week, here are a few suggestions:

1. STANLEY PARK:
This iconic park is a must-visit. Take a leisurely stroll along the seawall or explore the park's many trails. Don't miss the stunning views from Prospect Point and the beautiful Totem Poles.

2. GRANVILLE ISLAND:
Head to Granville Island for a unique shopping and dining experience. Explore the Public Market, where you can find fresh produce, gourmet foods, and local crafts. You can also enjoy street performances, art galleries, and theatres in the area.

3. GASTOWN:
Visit Vancouver's oldest neighbourhood, known for its cobblestone streets and historic charm. Explore the trendy boutiques, art galleries, and antique shops. Make sure to stop by the famous Steam Clock and grab a coffee at one of the cosy cafes.

4. CAPILANO SUSPENSION BRIDGE PARK:
A short drive from downtown, this park offers an exhilarating experience on the suspension bridge that stretches across a lush rainforest canyon. Explore the treetop walkways and the cliff walk for breath-taking views.

5. MUSEUM OF ANTHROPOLOGY:
Located at the University of British Columbia, this museum showcases the rich indigenous cultures of British Columbia and around the world. It houses an impressive collection of art, artifacts, and totem poles.

6. VANCOUVER ART GALLERY:
If you're interested in art, the Vancouver Art Gallery is worth a visit. It features a diverse collection of contemporary and historical art, including works by renowned local and international artists.

7. YALETOWN:
Once an industrial district, now a trendy destination for wining and dining from sidewalk cafes, cool restaurants, unique shopping, and leafy parks. Yaletown is a great place for a celebratory seafood dinner, a relaxed bistro meal, or a family-friendly feast.

8. VANCOUVER LOOKOUT:
Head to the Vancouver Lookout for panoramic views of the city skyline, mountains, and the Pacific Ocean. It's a great way to get a bird's-eye view of Vancouver's beauty.

General information

HOUSEKEEPING
At LNG2023, we are committed to making it an enjoyable experience throughout this week and please find below a few useful housekeeping guidelines:

ACCESS TO THE CONFERENCE AND EXHIBITION
Every time an attendee enters LNG2023 they will be asked to present government issued photo ID at security. This can be in the form of a passport (all nationalities), or driver's license (Canada and United States only).
All attendees, including accompanying persons, are required to wear their badge AT ALL TIMES during LNG2023 - this includes social functions. Attendees will only be able to access the areas of the event relevant to their participation as shown on their badge.

DRESS CODE
Business attire is requested for attendance at the conference, exhibition, technical tours and all networking functions.

DOWNLOAD THE APP
The app is an essential tool to help you navigate the event and contains the programme for the week, speaker profiles, exhibition layout, networking features and much more. For any questions on the Event App, our staff at the App Helpdesk would be delighted to assist you. LNG2023 App Helpdesk will be situated at the main event registration located on West Level 1, City Foyer – West Building or email info@lng2023.org

CONFERENCE REFRESHMENTS
Morning tea, lunch and afternoon tea are provided to all conference delegates. Please see the times and locations in the pocket programme or the LNG2023 Event App. All conference delegates are reminded to wear their badge to access these areas.

Bistros are open in both exhibition levels for food and beverage purchases for exhibitors and trade delegates. Café 185, located just up from the main registration will also be open for paid purchases.
All Networking Coffee Breaks are sponsored by:

SEMPRA INFRASTRUCTURE

CHARGING STATION
A Charging Lounge is located at Stand 141 in the Exhibition Level Hall.

PRAYERS ROOMS
Both male and female prayer rooms are located in West Exhibition Hall C. Please refer to Directional Signage for further details.

MOTHERS ROOMS
A peaceful and private Mothers Room is located on West Level 1, City Foyer. Please refer to Directional Signage for further details.

WATER STATIONS
Thanks to our Global Sponsor, Tellurian, all conference delegates have been supplied with water bottles which can be filled up at multiple points across the East and West buildings of the VCC. Please see the floorplan for locations.

TELLURIAN

PHOTOGRAPHY
The organisers of LNG have professional photographers taking photos throughout the event. These images may be used in post-event reports, case studies, marketing collateral and supplied to industry media. If you do not want your photo to be taken, please advise the photographer.

MEDIA CENTRES AND PRESS ROOMS
Brought to you by our Global Sponsor, Tellurian, we will have dedicated Media Centres and Press Rooms at the following locations:

West Building – Room 109 Level 1
West Building – Room 110 Level 1
East Building – Ballroom B
Convention Level

For media and PR inquiries please visit the Media Team at the Media Centre or you contact the team at marketing@lng2023.org

TELLURIAN

EMERGENCY PROCEDURES
In case of emergency, please follow the instructions given to you by security and venue staff.

MEDICAL SUPPORT
First Aid is located on West Level 1 at the entrance of the Exhibition space opposite registration and in the East Building Lobby on convention level.

LUGGAGE ROOM
A Luggage Room will be open outside Ballroom A in the East Convention Level on Thursday, 13 July for conference delegates leaving Vancouver directly after the conference.
It will be operational between 07:30 and 15:00.

SOCIAL MEDIA

ClubLNG **ClubLNG** **ClubLNG**
Connect with us on social media to stay up to date with all event highlights and to share your own LNG2023 experiences.
Event Hashtag: #LNG2023

WI-FI
Wi-Fi is available to conference delegates in all LNG2023 hosted spaces at the Vancouver Convention Centre.

SSID: LNG2023
Password: LNG2023#BC



LNG2023 showcases Canada's clean LNG

LNG Canada will produce the world's cleanest LNG starting from 2025, when first cargoes are expected from its 14mn tonnes/year phase 1.

Dale Lunan



Tim Egan (left), CEO of the Canadian Gas Association, opened the LNG2023 Conference with a Leadership Dialogue with Jason Klein, CEO of LNG Canada.

Canada will join the global LNG market in 2025 when the world's cleanest LNG will hit Asian markets, the CEO of LNG Canada, the Shell-led consortium developing a 14mn tonnes/year project on BC's northern coast, told an opening session at the LNG2023 Conference in Vancouver on Monday.

In a leadership dialogue with Tim Egan, CEO of the Canadian Gas Association and host of the conference, LNG Canada CEO Jason Klein said cargoes from the project will be 50% less emissions intense than the global average, and 35% less than the best plants operating now.

That's due to a number of factors in Canada's favour, including access to an abundant, low cost and low carbon intensity gas supply in the Montney and access to abundant hydroelectricity, to power not only the upstream production operations but much of the liquefaction opportunities now under discussion on Canada's west coast.

"We are really able to lean on the resources of BC Hydro to provide clean electricity for all of our facilities," Klein said. "We also benefit from the pinnacle of LNG design, and from a much cooler climate."

Shipping distances to Asian markets from Kitimat are half what they are from the US Gulf Coast, without the volatility of moving cargoes through the Panama Canal, and with shorter shipping distances, the environmental impacts of LNG trade from Canada are reduced.

The LNG Canada consortium – Shell, Malaysia's Petronas, PetroChina, Korea Gas and Japan's Mitsubishi – brings a wealth of global LNG expertise to Canada. In return, Klein said, LNG Canada is paving the way for the next wave of Canadian LNG – one that will be led by First Nations as full partners in two projects under development, Haisla Nation's Cedar LNG, and Nisga'a Nation's Ksi Lisims project north of Prince Rupert.

"We are watching very closely our good friends at Haisla who are leading the Cedar project and I'm very excited about the prospect of LNG carriers leaving Cedar, around the corner from LNG Canada, and travelling the Douglas Channel," Klein said. The world needs more reliable and responsible energy and we have the opportunity, here on the doorsteps of Asia, to deliver LNG that can displace coal, that can improve global emissions, and that can help hundreds of millions of people out of energy poverty."

While the first 14mn tonnes/year of phase of LNG Canada will enter service in 2025, its partners are already evaluating phase 2, which would double the output of the facility. All the permits are in place for that second phase, but Klein said LNG Canada must still manage stakeholder expectations around cost competitiveness, affordability, timelines, emissions and other factors.

"In that vein, we are evaluating alternatives to potentially further improve on our world leading design through additional electrification, as and when sufficient reliable power can be provided," he said. "We are having really good discussions with the government and BC Hydro about the infrastructure required to make that happen."

LNG Canada is now about 85% complete, and in the nearly five years since its partners made a final investment decision on the project, in October 2018, much has changed for the host Haisla Nation, its chief councillor told Egan in a second leadership dialogue opening LNG2023.

"That project has immensely changed my community in the last five years," she said. "We are talking about being at the table right from the beginning, actively participating in the project, and benefiting from revenue sharing that we are able to invest in revitalising our culture and our language."

Ten years ago, before LNG Canada set the bar high for indigenous participating in Canadian industrial projects, First Nations throughout the country "sat on the sidelines" and watched as others prospered from projects on First Nations lands and impacted not only the environment but also indigenous cultures.

"Now we are in a true partnership with LNG Canada and majority owners in our own project, Cedar LNG," Smith said. "We truly feel that these projects are a part of the solution."

Crystal Smith (right), chief councillor of Haisla Nation, discussed the impact LNG Canada is having on First Nations with Canadian Gas Association CEO Tim Egan.





Enbridge owns and operates a continental natural gas transmission network that extends over 32,000 km, including along the U.S. Gulf Coast and in Western Canada, where the company is well-positioned to serve growing LNG markets.

Natural gas can fuel the energy transition

By using electric motor drives powered by renewable hydroelectric power, the US$5.1bn Woodfibre LNG export facility currently under construction in Squamish, British Columbia, will be one of the cleanest of its kind in the world when it begins producing and exporting LNG in 2027.

"Woodfibre LNG will help reduce the world's greenhouse gas emissions by expanding global access to natural gas, displacing coal in power generation," says Cynthia Hansen, Executive Vice President and President, Gas Transmission and Midstream at Enbridge, which has a 30% ownership stake in the project.

"Our extensive natural gas system in British Columbia is uniquely positioned to support LNG exports to Asian markets, leveraging the province's plentiful gas reserves," she says.

The Woodfibre investment is part of Enbridge's strategy to grow its export operations and fully participate in North America's potential to become the top supplier of natural gas to the world.

"Natural gas is a clean, reliable and affordable energy source essential to the energy transition," says Ms. Hansen. "It will provide global energy security and help countries meet their carbon emission reduction commitments by displacing coal as a fuel for energy generation and backstop the intermittency of renewables."

Ms. Hansen notes that the U.S. is the world's top natural gas producer. The country is connected to a sustainable, cost-competitive supply and is well positioned to replace Russian exports to the EU, which have declined by approximately 15bn ft^3/day from their peak in 2019. U.S. exports are expected to double from 12bn ft^3/d to 25bn ft^3/d by 2035.

In Canada, competitive break-even costs and short transit times to Asia could propel natural gas exports growth to around 3bn ft^3/d by 2030.

Enbridge owns and operates a natural gas transmission network that extends over 32,000 km, including along the U.S. Gulf Coast and in Western Canada.

"We currently serve 15% of the export capacity at the Gulf Coast through four LNG facilities and, in line with our export strategy, we have agreements to serve at least three more, which we expect will increase our LNG service capacity to 30% by 2030," says Ms. Hansen.

Enbridge is committed to being the first choice for natural gas delivery in North America by continuing to deliver safe, reliable and sustainable energy to communities and businesses across the continent while rapidly growing exports, she adds.

"With global demand for natural gas forecast to grow by more than 16 billion cubic feet per day by 2035, North America's competitive advantage will make the continent a supplier of choice."

Ms. Hansen says Enbridge is totally committed to a sustainable, lower-carbon future.

"We have a comprehensive plan to reduce our GHG emissions intensity by 35% by 2030 and achieve net-zero emissions by 2050."

Reducing methane emissions is one part of the plan.

"As part of our commitment to reducing GHG emissions and supporting the transition to a low-carbon economy, Enbridge is working to reduce methane emissions across our operations," says Ms. Hansen, noting that in 2022, the company's methane emissions were approximately 23% lower than they were in 2018, the baseline year.

"We're seeing international buyers signing long-term agreements with facilities along the Gulf Coast, and more projects are reaching or nearing final investment decisions," says Ms. Hansen. "And with the trend towards differentiated LNG, our carbon emission reduction programs position us as the 'green transporter' of choice."

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Joseph Murphy



John Kuehn, president of supply and trading at Chevron

Chevron: leveraging existing strengths in the energy transition

John Kuehn, president of supply and trading at Chevron, tells NGW how the company is focusing on energy transition businesses and technologies where it can leverage its existing strengths.

Chevron is targeting 100,000 barrels/day of renewable fuels production by the end of this decade.



Chevron aims to leverage its existing strengths to provide lower carbon solutions, but also affordable and reliable energy to a world that needs more and more of that energy every day, John Kuehn, the US major's president of supply and trading, tells *NGW*.

"We're going to leverage our strengths to lower the carbon intensity of our existing value chains and traditional fuels," he says. "At the same time, we're also building new lower-carbon businesses. It's a two-pronged approach."

In 2021 the company established its Chevron New Energies unit, which is focused on "commercialisation opportunities in hydrogen, carbon capture, and offsets and support of ongoing growth in biofuels." During its second stage of development, the business aims to look at ways of scaling up these technologies.

Chevron is targeting 100,000 barrels/day of renewable fuels production by the end of this decade, and as part of this strategy, acquired market player Renewable Energy Group (REG) last year for $3bn.

The company will focus on delivering both higher returns and lower carbon energy as the energy transition progresses, Kuehn says, investing in businesses where it has a competitive advantage. Regarding renewable fuels, this advantage comes from Chevron capitalising on the value chains it has already developed for traditional fuels. When it comes to carbon capture and sequestration, Chevron will apply its existing geological expertise.

Kuehn believes natural gas will have a role both in the transition towards cleaner energy and to reach goals which advance a net-zero future.

"Energy systems have been evolving for hundreds of years, so we're always finding ourselves in energy transitions and this one is no different," he says. "Countries, people and stakeholders are looking for fuels that are affordable, reliable, and ever cleaner."

"Natural gas has long been a very affordable and reliable fuel, and it's one of the quickest ways to lower carbon intensity of the energy value chain, through switching from coal," he continues. "And if you start pairing up natural gas with some of the new technologies, such as carbon capture and hydrogen, you are firing on all cylinders."

Chevron is already a big LNG player in the Pacific basin, where it has supply projects in Australia. Last year it also announced long-term offtake deals with Cheniere Energy and Venture Global for a combined 4mn metric tons/year of LNG supply from the US Gulf Coast.

"We're evolving to become a global portfolio player," Kuehn says. "We do a lot of benchmarking versus our peers; we are looking at buyer surveys. We are looking for ways to always improve what we can offer to customers, to governments, to countries and stakeholders."

Chevron also gained a position in the East Mediterranean through its acquisition of Noble Energy in 2020 for $5bn. Through the deal it gained Noble's stake in the yet-to-be-developed Aphrodite field off Cyprus, which could supply gas for liquefaction.

The last two-to-three years have been a "wild ride" for the LNG market, amid turmoil created by the COVID-19 pandemic and the Russia-Ukraine conflict, Kuehn says.

"Stakeholders around the world have realised that what's required is a balance between affordable, reliable and ever cleaner energy," he says. Before the next wave of LNG comes in the latter half of this decade, the LNG market will likely remain tight.

How does Chevron seek to set itself apart from its peers? Kuehn says the company's focus is on optimisation of its systems and helping its customers do the same.

"What differentiates us from our peers is our customer focus and our focus on optimisation. We benchmark what the customers want and think about how we and our customers can be successful together," he says.

One keyway that Chevron is innovating in its business is by better assessing and reducing the greenhouse gas (GHG) intensity of its value chains. It is certifying an increasing amount of its US gas production as responsibly sourced. It also applies GHG reporting methodology to its LNG cargoes that it developed with Pavilion Energy and QatarEnergy.

"This helps increase transparency, increase customer stakeholder competence and allow investments to move faster with lower carbon initiatives," Kuehn says.

On LNG pricing, oil linkage will remain a major pricing mechanism as customers balance affordability and reliability and lower carbon options, he says. But increasingly, customers are eager to look at hybrid pricing, based on pricing indexes at platforms such as Henry Hub and TTF.

At LNG2023, Kuehn is looking forward to discussions about markets, energy security and lower carbon opportunities, and downstream infrastructure and applications.

"Vancouver is going to do a fantastic job hosting the event," he says. "Meeting together face-to-face has a real place in this industry – that's how relations get made and get cemented, and how business gets done."

Joseph Murphy



Paul Marsden, president of Bechtel's global energy business

LNG2023 brings the entire industry together to discuss the critical changes

Striking a balance between energy security, affordability and availability is no easy feat given the market's turbulence over the past few years, Paul Marsden, president of Bechtel's global energy business, tells NGW.

The upcoming LNG2023 conference in Vancouver next month offers the chance for the entire natural gas industry to come together to discuss the critical challenges that the world energy market faces, Paul Marsden, president of US EPC firm Bechtel's Energy global business unit, tells *NGW*. First and foremost among those challenges is striking a balance between energy security, affordability and availability – no easy feat given the market's turbulence over the past few years.

A global pandemic that shut the global economy down, followed by a fast-paced recovery and then the war in Europe, has disrupted markets and supply chains, as well as assumptions about energy planning, Marsden says. The LNG industry, where Bechtel is a leading developer of liquefaction, storage and regasification facilities, has seen its fair share of that volatility.

"Very mature, established supply chains became very rapidly disrupted," Marsden says. "Big producing industries in Southeast Asia effectively shut down during the pandemic, raising the question of where all this contracted LNG can go to," he says. "Then we reemerge from the pandemic, with global economies roaring back to life, and the next question is where is the LNG we really need."

Then came Russia's invasion of Ukraine. Europe, once reliant on Russia for 40% of its gas, has had the majority of that supply cut over the past year, prompting a scramble for more LNG and the construction of infrastructure to import it at breakneck speed. There was heightened demand globally for LNG as major US producers that previously sent most of their LNG to Asia began diverting it to Europe.

"Overlaid on top all of that, you had all the very, very bold climate commitments. But energy demand is increasing, and ultimately, we're coming to terms with the fact that the reliability of renewables doesn't match up to baseload hydrocarbon-generated power," Marsden says. "Essentially, the pendulum swung too far towards lofty ambitions and net zero, but without the technology or supply chains to deliver that. But then, with demand for energy coming back, we've gone back to what we know, which in some cases meant turning coal plants back on, which was a huge step backwards."

Now with the market showing early signs of rebalancing, there is a greater sense of clarity, Marsden says. This is evident in how the oil and gas majors have restated their ambitions, clearly stressing that hydrocarbons are here to stay.

"We need to focus on being more energy efficient. We need to focus on using cleaner hydrocarbons. We need to modernise our facilities and reduce their emissions," he says. "And focusing on that, it's quite incredible what you can achieve in terms of reducing carbon intensity without making our energy system vulnerable as it has been in the last couple of years."

LNG2023, he says, "gives the whole industry the opportunity to all come together to talk about those challenges, including the supply chain, the operators and the customers buying the products."

Maintaining a social licence

LNG has a critical place in the energy mix for decades to come, Marsden says, stressing its value as a cleaner source of baseload power versus coal, with modern combined-cycle gas turbines producing three times less stack emissions than coal plants.

How should LNG retain its social licence going forward? Marsden believes there's too much focus on addressing the 5% of natural gas used in combustion at liquefaction plants, using costly technologies such as e-drives and carbon capture, and not the 95% of emissions associated with the end use of the fuel. Ongoing innovations in gas-fired power generation will be crucial for dealing with the latter.

"Modern combined-cycle power is incredibly efficient," he says, citing the recent launch of SSE Thermal's Keadby 2 power plant in the UK that has a thermal efficiency of 63%. "You can add carbon capture to those facilities, but it's a lot of cost that ultimately has to be borne by the consumer, who has already been hit by high inflation and high energy prices. Suggesting to the consumer you have to pay more to make this power a little bit cleaner is probably not going to land very well."

Marsden sees further scope for additional innovation in combined-cycle technology to make it cleaner and more efficient, pointing to the electric vehicle industry as an example where rapid technological advancement has taken place in the space of a mere decade.

As an EPC contractor, Bechtel works with operators to improve project efficiency and limit the environmental impact, while also engaging with suppliers to ensure they are using the best technology available, Marsden says. The company also focuses on its own emissions from construction activities, seeking ways to use less fuel and more electrification. And these efforts can also save Bechtel money, he says.

Bechtel also takes heed of the social impact of its operations, the executive notes.

"We build big stuff, but we also build big legacies. So, when we leave the community, we leave that community with healthier supply chains and an upskilled workforce. We put services and jobs in that area in a sustainable way, so that when we leave, there isn't a vacuum."

COVID-19 was a major disruptor of the global labour market, which posed another challenge to the industry.

"When the world woke up from its COVID slumber, and you had all this government stimulus put back into economies to revive them," he says. "All that has created a huge appetite for building new infrastructure. We don't have the workforce to go build everything we want to build."

"We've got to focus on how we do more work with less people – that's not about being more productive but being smarter."

Greater automation and mechanism has a role to play, he says. So does increased modularisation, where work can be spread across different parts of the world. But this is not as robust a solution as it used to be, as the labour shortage is a global problem. With a reduced pool of available workers, the focus should be on attracting more young people into the market.

One step Bechtel is taking to do this is by establishing programmes with local schools and colleges to develop comprehensive programs that will grow a skilled workforce, benefiting local regions for many years to come, he says.

Paul will be speaking on an LNG2023 panel entitled PL.04 Growth of LNG Through Innovative Partnerships and Cooperation on July 12 at 09:15-10:15 at Plenary | East Exhibition Hall A.

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Joseph Murphy



Clint Strittmatter, Principal Process Engineer at McDermott

McDermott: net-zero LNG is a realistic goal

Clint Strittmatter, Principal Process Engineer at McDermott, argues that net-zero LNG is a realistic goal but needs credibility. He also discusses with NGW the latest developments in addressing methane emissions at LNG facilities and the benefits and evolutions in modularisation.

Is net-zero LNG a realistically attainable goal and how should the industry best work towards it?

Net-zero LNG is a realistic goal but to ensure credibility, the LNG industry should address the complete value chain from upstream through to end user. Achieving net-zero across parts of the LNG value chain is attainable but is challenging across the entire value chain. The following points can be made for each element of the LNG value chain, noting that approximately 75% of the GHG emissions would result at the end user.

Upstream; Achieving net-zero emissions on the upstream side is challenging and dependent on the source of the natural gas, whether onshore, offshore, through conventional drilling or fracking. There are multiple initiatives in place to reduce emissions, from electrification of production facilities using renewable energy through to detection of, and elimination of, fugitive emissions.

LNG Liquefaction: There are multiple ways to reduce emissions from LNG liquefaction facilities. The use of electrically driven compressors, taking power from renewable sources, has the largest impact, enabling an 80%-90% reduction in GHG emissions when compared to a traditional industrial gas turbine driver configuration utilised by most of the world's LNG facilities. The majority of the remaining emissions can be mitigated through design features that limit flaring during trips/start-ups and sequestration of the CO_2 that is removed from the feed gas. A small amount of difficult-to-eliminate emissions would need to be offset by carbon credits.

LNG Transport: There have been many advances in emission reduction from LNG carriers including efficiency improvements in ship design and engine technology as well as reductions in venting and fugitive emissions of methane. To achieve net-zero, offsets through carbon credits would be required.

LNG Regasification: LNG regasification facilities have a limited energy requirement. Use of heat from ambient sources, air, water, or utilization of waste heat from nearby industries, can bring the emissions to near zero with the final small, and often intermittent, emissions offset by carbon credits.

End User: This becomes industry and end user specific, but in general, to achieve a net-zero scenario will require carbon capture with sequestration plus an element of offset using carbon credits.

What developments are we seeing in the area of addressing methane emissions at LNG facilities?

In general, methane emissions are very low on existing LNG facilities due to an increased use of welding of piping rather than the use of flanges. There is increasingly more focus on the source of methane emissions and implementation of schemes to reduce, and if possible eliminate, such emissions through implementing seal gas recovery systems and reduced emission valve glands into designs. There is also increased focus on reducing operational flaring, whether due to normal operation, shut down, start up, and non-routine emissions. For owners and operators there are opportunities on the operation and maintenance side of the LNG facility to implement increased frequency of leak detection and repair (LDAR) programs. More advanced detection systems such as infrared cameras and laser-based detectors are being deployed to make LDAR programs more efficient and effective.

What are the main benefits of the modularization approach and are we seeing the industry adopt it more, and if so why?

The prime drivers to adopt a modularization approach are:

Labor Cost: This is a benefit if module fabrication facility labor costs are lower than field labor costs, especially when the infrastructure required to support crews in the field is considered.

Productivity: Module fabrication facilities have a stable workforce, well proven standards, procedures and assembly-line techniques that add to the overall efficiency of the fabrication process. The work in the fabrication facility is performed in a covered and/or environmentally controlled environment. This eliminates the loss of productivity due to wind, rain, flooding, lightning, etc.

Equipment: With proper work scheduling and sequencing, a modularization approach can allow for reduced on-site costs due to a reduced requirement of equipment in the field.

Safety : Shifting work into a controlled fabrication facility environment generally benefits the overall safety risks of a project.

Reduction of Peak Workloads: Modularisation reduces the amount of direct and indirect field labor. This can be an important factor in projects that are competing for resources with other projects or simply are limited in local resources. Cost can be saved due to reduction in size of temporary facilities, camps, transport of workers, food, water, housing, medical needs, and recreation facilities at the jobsite.

Schedule: On projects that are hampered by a lengthy permitting process, modularization can effectively allow construction to begin months earlier in the fabrication facility. Once the permit is acquired, modules can be set much quicker than the time required for onsite fabrication and assembly. The LNG industry is seeing an increasing focus on implementing a modular execution strategy, primarily as this provides greater certainty on project delivery, both on cost and schedule. This reduces the uncertainties that are not often under the total control of the EPC contractor, whether these are political, social, or climate influenced events.

In what ways is this modularization approach evolving?

The early module concepts in the LNG industry were often based on stick built layouts which resulted in a missed opportunity of greater reduction for site based activities relating to hook up, installation and commissioning. Subsequent modular LNG designs were developed for the early Floating LNG projects. Again, these had specific constraints, whether due to marinization requirements or limits on available footprint with resulting safety/hazard implications.

In recent years the LNG industry is moving to modules in the 1000-10,000-te size range, based on an increased degree of standardisation and repeatability of the module design. It is also developing modules on a system basis thereby minimising site hook up and commissioning activities.

Europe today, Asia tomorrow - the future of LNG demand



Ross McCracken

"We got lucky, it was a very warm winter," said Mike Lewis, CEO of German utility Uniper, a company which suffered more than most from the loss of Russian pipeline gas supplies following the invasion of Ukraine in late Feburary 2022.

Speaking at an opening session of LNGC2023 in Vancouver, Lewis said the gas crisis which ensued highlighted not just the importance of natural gas in terms of heat and energy supply in Europe, but its centrality to the broader European economy.

Lewis said there would be no turning back. Referring to Europe's reliance on Russian pipeline gas, he commented: "We had a single point of failure, and it failed". Key to addressing that single point of failure was LNG, which "showed how quickly we could move away from pipeline gas" and revealed "enormous flexibility in the LNG supply chain," he said.

He expects about 45bn m^3 of regasification capacity to come onstream in Germany alone in the next 4-5 years. He also expects the closure of coal plant to maintain the necessity of LNG imports as Europe seeks to reduce its greenhouse gas emissions. He said Uniper would continue to seek diversification and flexibility in supplies, and that there was reasonable visibility over the next decade in terms of European gas demand. However, beyond that, the situation is "very, very challenging."

Hoping for warm winters is no energy policy

Speaking at the same session, Octavio Simoes, CEO of US LNG developer Tellurian, said the short-term need for LNG in Europe remains acute. He warned that Europe still faces a challenge in securing gas supply over the next four years, owing to the relative lack of new supply coming to the market until the mid- to late-2020s. "The problem for Europe will not be over for four years. We can't just keep praying for warm winters. That is not an energy policy," he said.

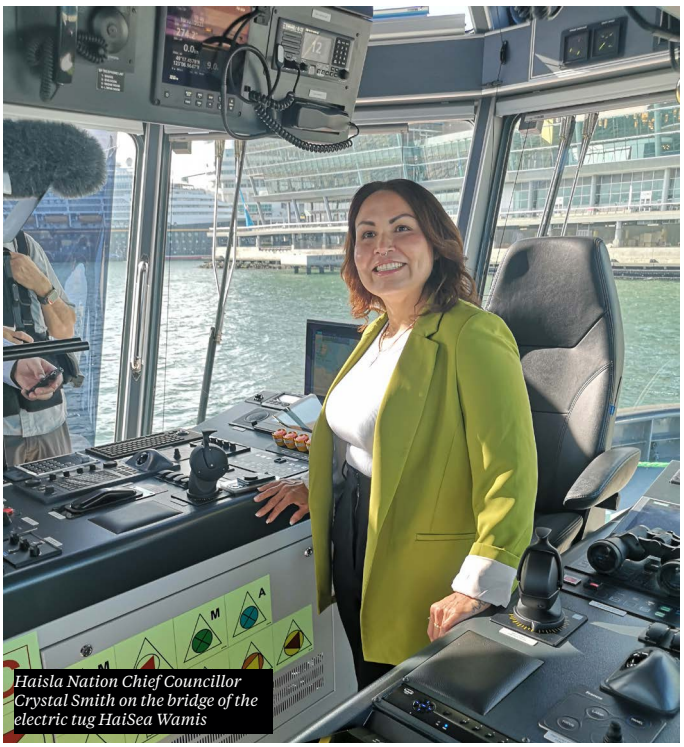
Simoes said a key problem was a lack of investment in oil and gas supply which pre-dated the Ukraine crisis and could be traced back to 2014. He said for the last three years, European banks have been unwilling to invest in fossil fuels, but that changed a year ago when the energy crisis became serious. The lack of investment means new supply has not kept up with demand and the natural decline from existing projects, leading to shortages.

Long-term LNG demand more certain in Asia

Yet the need to reconcile the short-term nature of Europe's demand for LNG and the longer-term implication of the energy transition remains a brake on new LNG investment.

According to Lewis, this can be resolved by providing European buyers flexibility in destination, tenure and pricing so that LNG can later be re-directed to Asia to displace the region's massive coal use once gas demand begins to fall in Europe. As such, LNG can play a long-term role first in meeting Europe's immediate emissions targets and need for energy security, and then longer term as Asia attempts to address its reliance on carbon-heavy coal.

Electric tugboats spurring positive change, says Haisla chief



Haisla Nation Chief Councillor Crystal Smith on the bridge of the electric tug HaiSea Wamis

Monte Stewart

Electric tugboat that will service the under-construction Shell-led LNG Canada near Kitimat, on BC's northern coast, will help create positive change in indigenous communities, Haisla Nation chief councillor Crystal Smith says.

She made the comments Monday during a tour of the HaiSea Wamis, the first electric tugboat built under a joint venture between the Haisla and marine services provider Seaspan, as the vessel was docked in Vancouver's inner harbour for the LNG2023 conference.

"In regards to the meaning of the tugs, they've definitely taken that whole aspect of environmental impacts and (reduced) it in a very meaningful way in regards to having one of the first electric tugs being operated in the entire world in the Douglas Channel, where our nation's territory is," Smith said.

The Haisla Nation is the majority owner of the joint venture, which is known as HaiSea Marine. Shell-led LNG Canada contracted the company to build the electric tugs, which will help dock LNG tankers at the terminal near Kitimat, as part of a 12-year, $500mn agreement.

The 28-metre HaiSea Wamis is the first of three zero-emission electric harbour tugs being built under the deal. The company is also building two dual-fuel (diesel and LNG) escort tugs that will meet LNG tankers at Triple Island near Prince Rupert and guide them through the Douglas Channel to the LNG Canada terminal.

"We see value in our partnerships that have the values aligned with our nation, where they want to create that meaningful opportunity," Smith said. "The impacts on the environment, wherever we can make the necessary changes that would reduce any impacts in our territories, are the most valuable to indigenous communities. So, partnering with Seaspan (on) HaiSea was, essentially, a no-brainer for our community."

The electric tugs are being built at Sanmar Shipyards in Turkey. Vancouver-based Robert Allan Ltd., an independent, privately-owned firm of consulting naval architects and engineers, is designing the tugs.

The HaiSea Wamis has nearly 5,300 KwH of battery capacity, which allows the tug to do all of its missions on full battery, said Jordan Pechie, HaiSea Marine's director of operations.

The charging station is located onboard the tug and connects to a state-of-the-art tug facility at the LNG Canada terminal site.

"At our tug facility, we have three connections for charging for these these harbor tugs," said Pechie. "We have three megawatts of power coming to the tug basin, so it's quite significant. So from almost zero discharge to full, it takes about four hours to charge."

The HaiSea Wamis is ultra-quiet. Audio recordings made in the tug's bridge area are of studio quality.

"It's awesome," said First Nations LNG Alliance CEO Karen Ogen, about the tug as she and others hovered around the tugboat's helm. "I didn't even know it was on."

Pechie said HaiSea Marine is applying for an underwater noise notation for HaiSea Wamis from the classification society with which the company registers vessels.

"So, underwater noise notation basically means this is going to be the quietest vessel on the British Columbia coast," he said. "And, that's important for the protection of the marine mammal environment. That's also never been done before."

The HaiSea Wamis was named after the first settler of Kitimat. The Haisla and the Gitxaala and Gitga'at nations, through which LNG Canada vessels will pass, all played roles in giving indigenous-related names to the three electric harbour tugs and two dual-fuel escort boats.

"It comes from the community," said Ogen of the naming effort. "So it's a true, community-driven process."

Industry competition key to tackling methane emissions



Joseph Murphy

Competition amongst natural gas industry players in terms of how effectively and transparently they quantify and reduce their methane emissions will be key to tackling the issue, panellists said at an LNG2023 session on July 11.

"The solution to this challenge is competition. In the LNG market we're competing on price, operational track record, as well as additional contractual terms," Robert Fee, vice president for international affairs and climate at Cheniere Energy, explained. "We also need to start competing on methane emissions, through measurement, informed data and transparency."

This competition on methane emissions can also be effective in the upstream sector, and can hopefully filter down to all levels of the natural gas value chain, he said.

It is also up to consumers to stimulate this competition by demanding cleaner gas supply, added Hiroshi Hashimoto, senior analyst for LNG and gas at The Institute of Energy Economies - Japan (IEEJ). In particular, consuming markets should send clear signals that they want lower methane intensity gas in order to give greater incentives to those countries in the world that are the worst methane emitters, he said.

The industry's overall performance in addressing methane emissions has been mixed, Julien Perez, vice president for strategy and policy at the Oil & Gas Climate Initiative (OGCI), said. OGCI, which includes 12 of the world's largest oil and gas producers, had a combined upstream methane intensity of only 0.17% in 2021, after reducing absolute emissions by 40% over the last four years.

But in the industry as a whole, a lot more work needs to be done, he said. Methane intensity in the industry has fallen by 18% over the last decade, and gas flaring is also falling, but absolute methane emissions have risen by 20% in the last 20 years.

"We're not close to where we need to be," he said. "Absolute methane emissions need to fall by 80% and intensity by 70% in the next decade, in line with the IEA's Net Zero scenario."

Hiroshi also noted that there was underreporting of downstream emissions that needed to be addressed.

Francisco De La Flor Garcia, director for sectorial and multilateral representation at Enagas, said performance on methane emissions among different companies greatly varied, with there being some clear frontrunners and others barely keeping up with the regulation.

The panellistts agreed that technology – increased deployment and further innovation – had a critical role to play in tackling methane emissions. But so too do maintenance and best practices and policies and regulation.

"They are sequential," Fee said. "You need the technology first to identify the emitters, and that then informs the maintenance and best practices. Then if companies are not able to deploy the technology or perform those practices, you need the policies and regulations to enforce them to do so."

De La Flor Garcia drew attention to regulation in the EU that imposes standards for methane detection, quantification and mitigation not only on companies working within the bloc but also third-party gas suppliers elsewhere as a model to follow. In this way, high standards in some key consuming markets can spread worldwide.

The panellists added that not only must the industry compete but also cooperate, in terms of sharing knowledge and best practices to address methane emissions.

LNG terminal peak buildout a long way out, say experts



Monte Stewart

The global buildout of FSRUs will peak after 2035, say experts who participated in a panel discussion Monday at the LNG2023 conference.

"We estimate a peak towards 2040," said Martin Cartwright, classification group DNV's global business director of gas carriers and FSRUs. "And towards 2050, LNG – or natural gas, I should say, becomes the single largest source of fuel globally – no matter what direction we go politically, because it's the most stable at the moment."

DNV believes that LNG demand will peak near 2040 as natural gas use increases, oil and coal deployments subside and electrification grows via renewable energy sources.

That leaves plenty of running room for more FSRU growth, Cartwright added.

"Peaks are still to come for quite some time," he said.

Cartwright's view matched those of fellow panelists Jamie Webster, Boston Consulting Group associate director and managing partner of its Center for Energy Impact, who moderated the session, Kjell Wouters, global business director of gas carriers and FSRUs for engineering services firm Exmar, and Yeo Fukui, CEO of family-owned Japanese marine supplier Fukui Seisakusho.

"Our point of view is that the peak is absolutely not there yet," said Wouters.

But the panelists' predictions contrasted with audience members' general outlook. In a survey conducted during the session, 74% of audience members predicted that FSRU buildout would peak before 2035.

Webster was taken aback by the differing views.

"It's always tough on these surveys, because people are not aware," he said in an interview. "So they're not quite sure how to do it. It was very clear that the panelists seemed to think that it was going to take quite some time before you got out, whereas everybody else seemed to think that this peak would come before 2035. This is one of these times where I wish we could have had some interaction from the audience to try to figure out what the thing was, because it was stunning."

Webster noted that, historically, most peaks in energy have taken longer than most people predicted.

He expects peak FSRU buildout to occur well after 2035, pointing out that Wouters told the audience that an FSRU could be moved from one country to another.

"And, we know that there's lots of countries that are dying for not just infrastructure, but actual molecules," said Webster. "And, so as these FSRUs get older, they still are operational. So, I think there'll be a lot of advantages to still being able to use these. So, I don't think a peak is going to be coming anytime soon."

But DNV's Cartwright was not as surprised as Webster about the opposing panelist and audience predictions.

"If you're talking about buildout and FIDs, for example, investments, yeah, perhaps that stops come 2035," he said in an interview. "But everything's still going to have to come online. And, the volume of gas is still going to increase from that point. So, it depends how you're looking at the question."

Cartwright said he would "almost agree" with the prediction that financing of FSRUs will peak before 2035.

"But if you're looking at the peak of LNG demand, that's a different story," he said.

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