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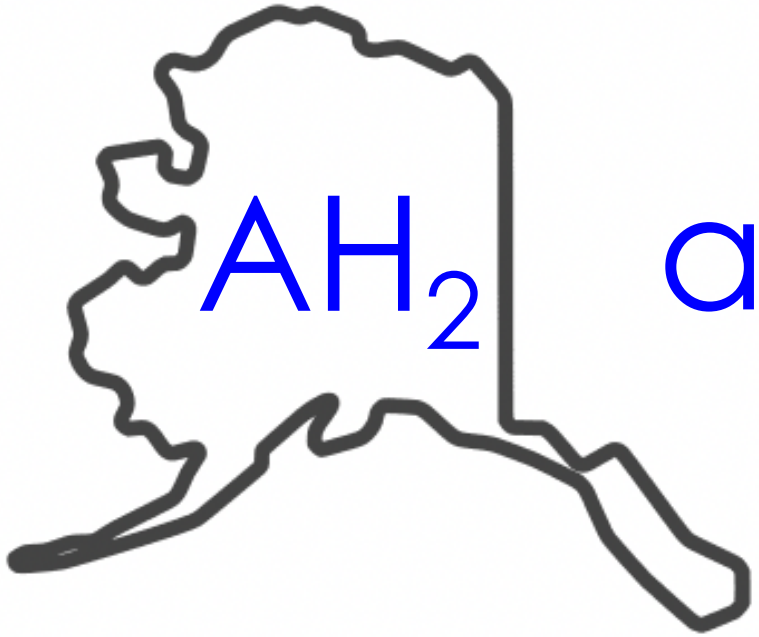
alaska marine power



alaska hydrogen
アラスカ水素

State of Alaska
House Energy Committee
May 6th, 2025

key messages

Alaska
- is well positioned for the new multi $billion export market for renewable energy
- can be a renewable energy superpower as Asia moves away from fossil fuels
- can export oil, LNG **and** low-carbon hydrogen

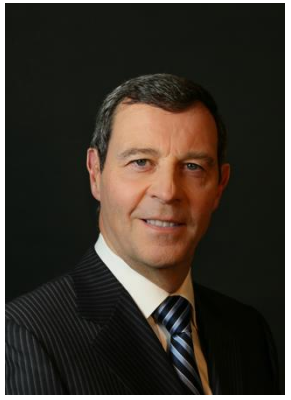
Alaska Hydrogen Project
- competitive, executable & bankable
- low-carbon hydrogen for Japan & S Korea
- sustainable aircraft fuel (eSAF) for Anchorage Airport
- low-cost, clean electric power for Alaskans and Alaskan mines
- 1,000s of stable, highly-skilled jobs

Alaska Marine Power
- project developer

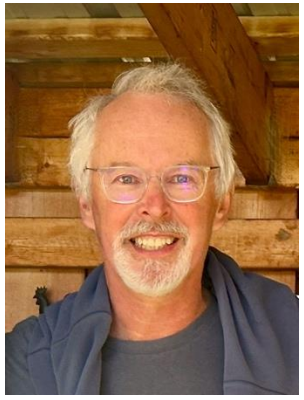
Alaska Marine Power

mission
- developing renewable energy at scale to grow Alaska ... and cool the planet

energy & experience
- oil & gas development (US, UK, Norway, Russia, Australia)
- power generation, submarine transmission & control
- arctic, offshore & subsea engineering/construction
- mega-project economics & finance
- commercial negotiations & asset trading



<u>David Clarke</u>
engineering director
BP Exploration (36 years)
MBA (Heriot Watt, Scotland)
project management (MIT)
BSc process eng (Sheffield)



<u>Simon Harrison</u>
commercial director
BP Exploration (31 years)
MBA (Cranfield, England)
subsea engineering (North Sea)
MPhil/BSc mech eng (Nottingham)

hydrogen - a new industry for Alaska

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Nikiski

LNG

CO_2

natural gas

reservoir storage

carbon dioxide

cryogenic storage

O_2 H_2

reservoir storage

hydrogen

Alaskan interior

electricity

residential & commercial power & heat

4

electric mines & dump trucks

electro sustainable aircraft fuel

3

international air transport

Lower Cook Inlet

geothermal

1

Cook Inlet Wind

eSAF

liquid hydrogen

liquid ammonia

export markets

eSAF

LH_2

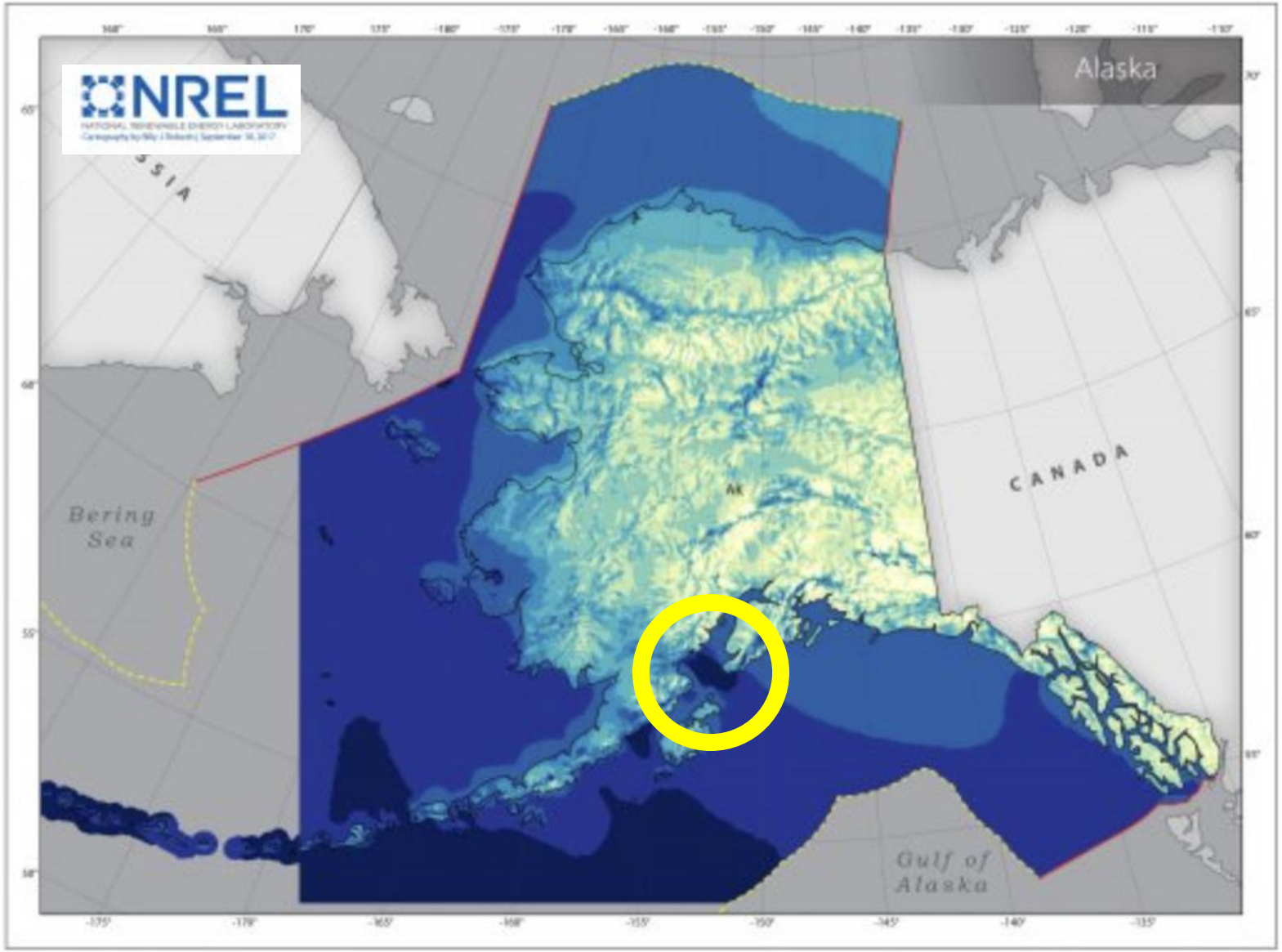
NH_3

international air transport

transportation
power generation
heavy industry
fertilizer

2

Cook Inlet Wind



Wind Power Resource of the United States
Wind Speed at 100 m Hub Height

- one of four near-shore US locations with average wind speeds > 10 m/s
- only such location
  - cold/dense wind
  - water depth < 60 m
  - energy community
- 64% gross capacity factor (NREL 2023)

1

Cook Inlet Wind

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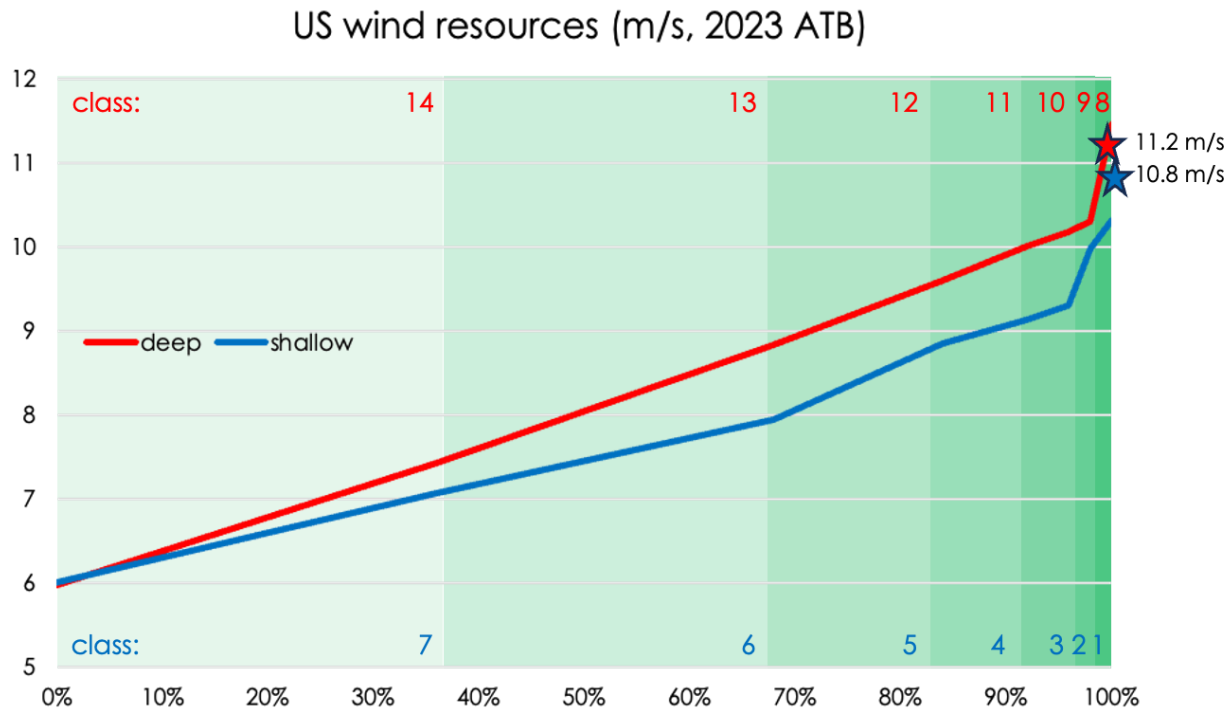

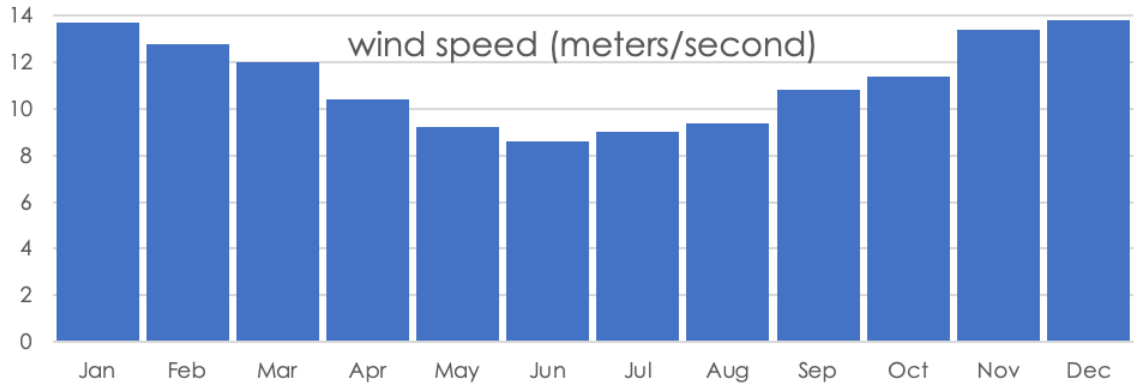

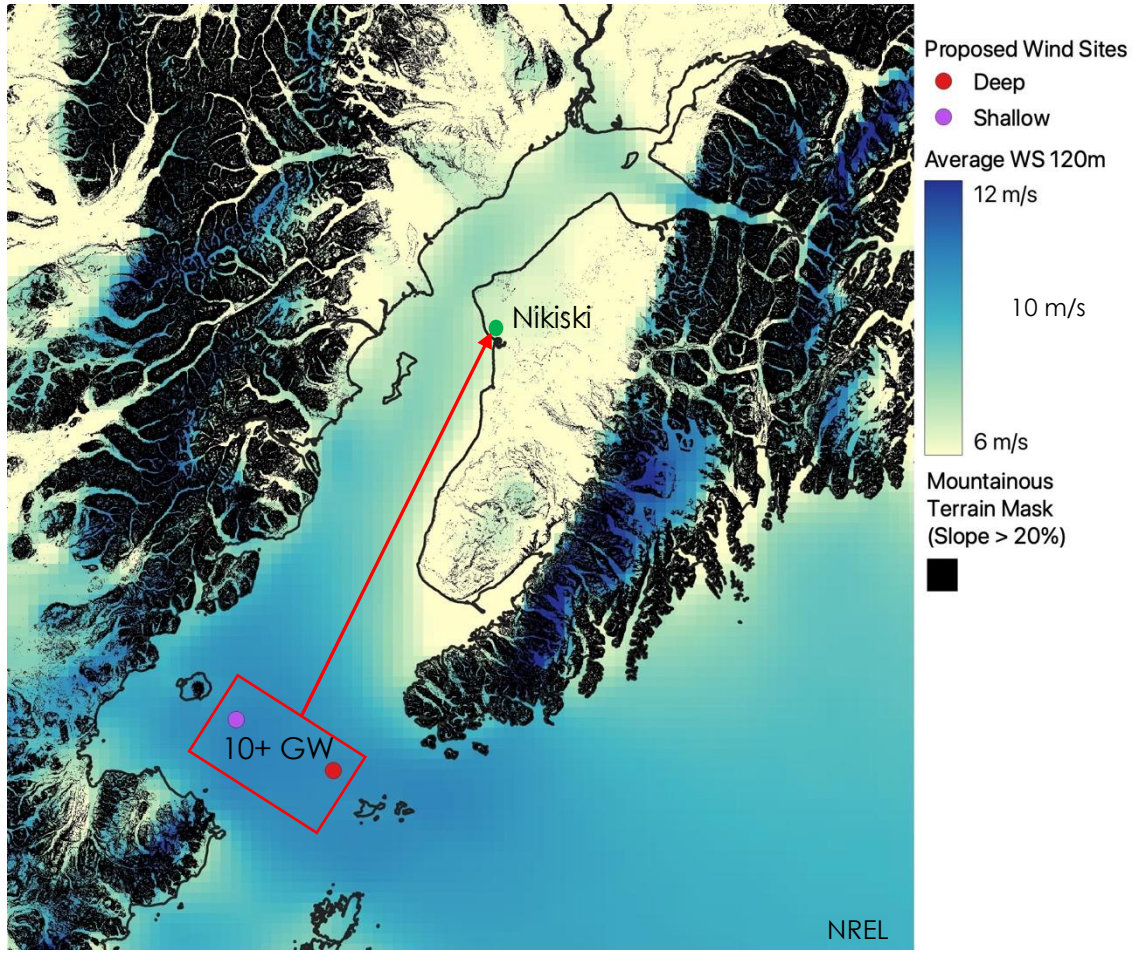

1 2

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Alaska Hydrogen can compete

facilities	1st phase	potential
• offshore wind power	0.5-1.0 GW	10 GW
• hydrogen production	50-100 kt/y	1 million tonnes/year

<u>great geography</u>
- world-class offshore wind resource
- proximity to Japan
- brownfield site & deepwater port (Nikiski)
- underground hydrogen storage potential

<u>long history of exporting energy</u>
- coal, oil & gas (ammonia & LNG)

<u>bilateral relations</u>
- US-Japan military alliance
- US-Japan trade ($76 bn US exports, $147 bn US imports in 2023)

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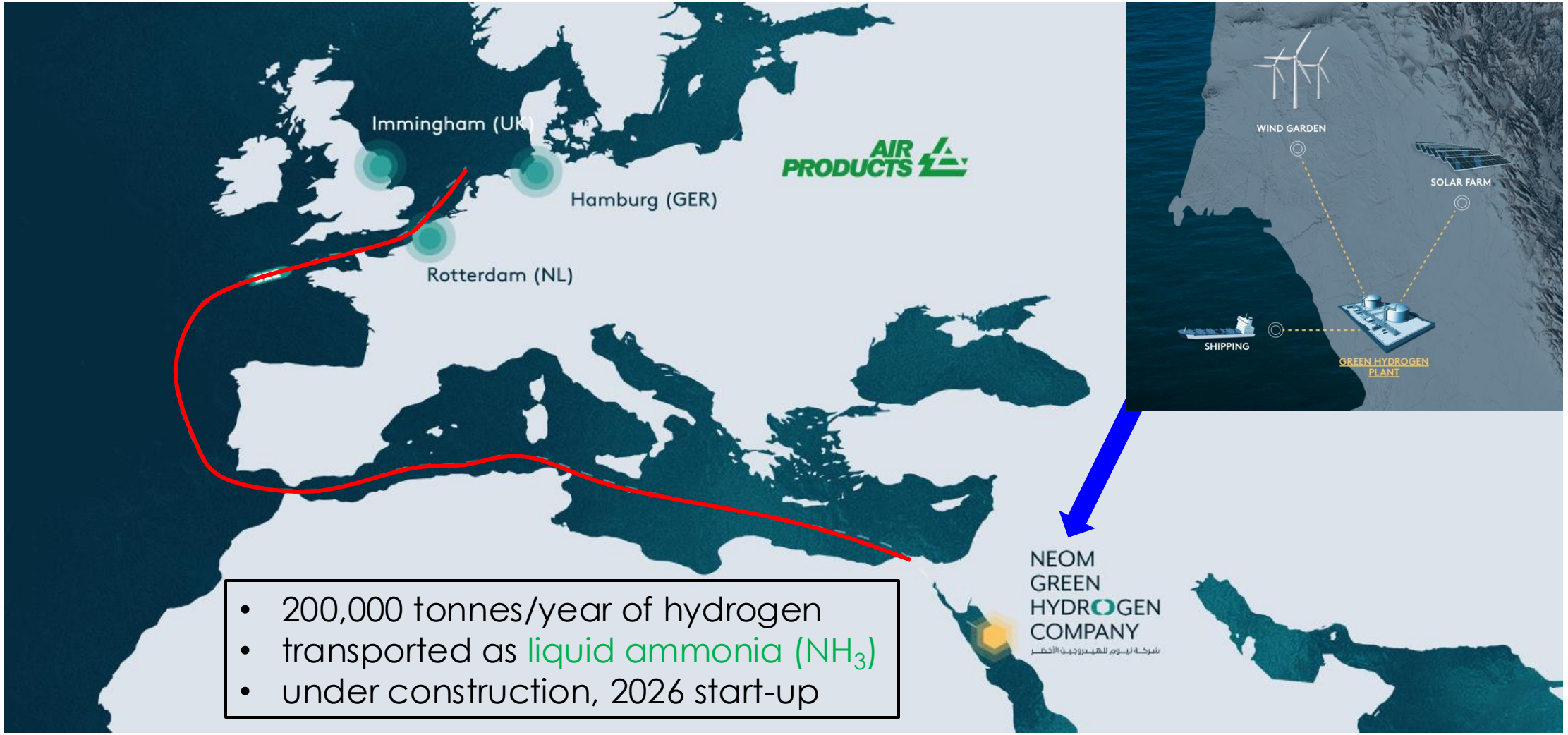
Europe will import low-carbon hydrogen



- 200,000 tonnes/year of hydrogen
- transported as liquid ammonia (NH_3)
- under construction, 2026 start-up

2

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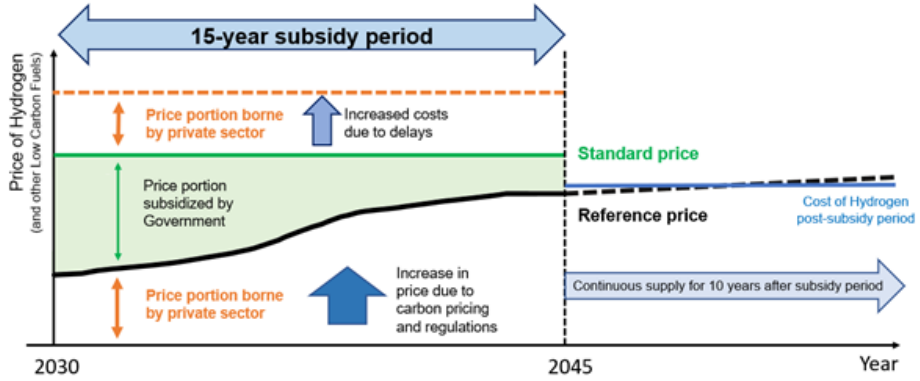
Japan also wants low-carbon hydrogen

Hydrogen Society Promotion Act (2024)

why
- climate change (60% emissions reduction by 2035)
- long term economic growth

how
- "contract for differences" (CfD) subsidy
- ¥7 trillion ($45 billion) in subsidies & R&D by 2040
- Japanese investment in supply chains

what
- 12 million tonnes/year by 2040



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Australia is already hard at work …

location	Queensland	Western Oz	Western Oz	Alaska
project	CQ-H_2	Murchison	WGEH	Alaska Hydrogen
• 1st phase (H_2 kt/yr) • potential (H_2 kt/yr)	75 300	350	330 4,000	50-100 1,000
energy source	onshore wind & solar	onshore wind & solar	onshore wind & solar	offshore wind geothermal
transportation modes	liquid H_2 ammonia	liquid H_2 ammonia	liquid H_2 ammonia	liquid H_2 ammonia
distance to market	3,900 nm	4,400 nm	5,400nm	3,300 nm
start-up date	2029	2031		early 2030s

AMP is marketing Alaska Hydrogen to Japanese off-takers

3

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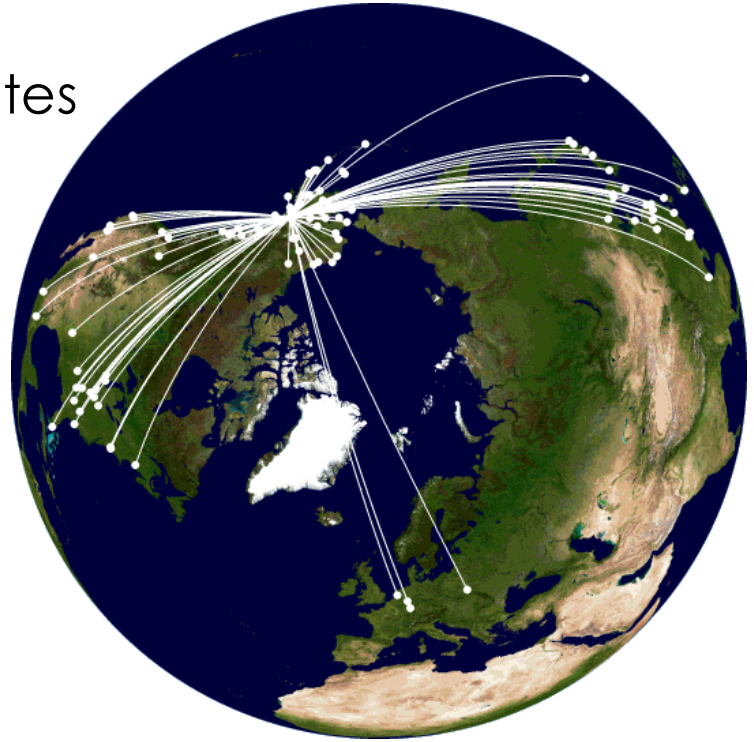
sustainable aircraft fuel (SAF)

why
- airlines will have to transition to SAF on international routes
- cargo airports must supply it



Anchorage *International* Airport's options
- import (from where and when?)
- refine it from Alaska's fats & biomass (limited volume)
- make it from low-carbon energy (eSAF)
  - Cook Inlet Wind has potential to supply 100%

next steps
- AMP have partnered with a global SAF specialist
- on-going State-sponsored SAF study with airport and airlines

4

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hard rock mining

why
- international miners are under pressure to reduce their environmental impacts

options
- traditional fossil mine
  - emissions, spill risk, highly volatile cost
- modern electric mine
  - electric transmission line
    - power plant with CCUS
    - or Cook Inlet renewable energy

next steps
- joint studies with Alaskan mine developers

electric dump truck

key messages

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Alaska Marine Power
- project developer
- david.clarke@alaskamarinepower.com

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アラスカは日本に低炭素水素を供給できる
Hey! Alaska can supply low-carbon hydrogen to Japan

… 仕事に取り掛かりましょう
… let's get to work!