



H2 Twin Cities Teams Showcase

H2IQ Hour Special Webinar
October 22, 2024



Housekeeping

- Attendees will be in listen-only mode
- Audio connection options:
 - Computer audio
 - Dial in through your phone (best connection)
- Automated closed captions are available
- Use the Q&A panel to ask questions
- Technical difficulties? Contact Erik Ringle through the chat section, lower right of your screen
- Recording will be available at:
<http://www.energy.gov/eere/h2twincities/>

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Welcome



Vanessa Arjona

Operations Manager, U.S. Department of Energy
Hydrogen and Fuel Cell Technologies Office; and
CEM H2I H2 Twin Cities Coordinator

www.energy.gov/eere/fuelcells/

Opening Remarks – CEM H2I Perspective



Per Anders Widell

Programme Manager, International Energy Agency, and Clean Energy Ministerial (CEM) Hydrogen Initiative (H2I) Coordinator

www.iea.org/programmes/cem-hydrogen-initiative



H2 Twin Cities Initiative Overview





2022 Program Round Winners



H2 – TRANS – PACIFIC Team

Mentor-Mentee Cities

Lancaster, CA (US), County of Hawaii, HI (US),
and Namie Town (Japan)



Hydrogen is Here! Team

Sibling Cities

Aberdeen (UK) and Kobe (Japan)



Hydrogen is Here! Program Overview

Presenter: Robin Dillaway, Project Officer, Aberdeen City Council







2022 Sibling Cities Winner

Hydrogen is Here!



Aberdeen, United Kingdom 

 Kobe, Japan



Deputy Director General Fujii
and Lord Provost Cameron
WECP AGM on Aug 2024

Michito AOI, Director, Energy Planning, Environment Bureau, Kobe City Government

Robin Dillaway, Project Officer, Aberdeen City Council

Presentation October 22, 2024 by Robin Dillaway



Hydrogen Co-Generation System Courtesy of KHI



Large-scale demonstration projects



H2 bus

Mobility



H2 garbage truck



H2 refuelling station



H2 unloading facilities 提供: HySTRA

H2 Twin Cities Project

Work Packages:

WP1 – Public Engagement

WP2 – Hydrogen Ports and Shipping

WP3 – Hydrogen for Heat

WP4 – Jobs, skills and inclusion

WP5 – Emission Reduction

WP6 – Supply Chain Platform

Activities through Programme Year 1 and 2:

- Knowledge sharing meetings
- Public webinars
- In-person visits

Next steps:

- Identifying opportunities for feasibility studies and pilot projects related to WP2

Webinar - Aberdeen City



Hydrogen Twin Cities: H2 Aberdeen - Hydrogen is Here



Aberdeen (UK) and Kobe (Japan) are members of H2 Twin Cities, an international partnership to advance the implementation of hydrogen and fuel cells in society. We will be holding two webinars for the purpose of sharing knowledge about the hydrogen projects carried out by both cities.

Hydrogen Twin Cities: H2 Aberdeen - Hydrogen is Here is a webinar organised as part of the Hydrogen Twin Cities initiative between Aberdeen, Scotland and Kobe, Japan. H2 Twin Cities is an initiative under the Clean Energy Ministerial (CEM) with support from multiple CEM country members (including the UK) where two or more cities can apply to receive support to share ideas, mentor and learn from each other.

As part of the project, Aberdeen and Kobe will share and develop best practices and lessons learned between each other, as well as showcase to other regions through the H2 Twin Cities platform, in order to further accelerate progress.

Click here for information on Kobe City and Aberdeen City's efforts regarding H2 Twin Cities: <https://www.energy.gov/eere/h2twincities/h2-twin-cities-2022-winners>

Thursday
25 January 2024
8:00-9:30 (GMT)

Speakers :

- ☛ Claire Stevenson, Team Leader - Projects, Aberdeen City Council
- ☛ Frank Burns, Contract Support Engineer, Norco
- ☛ Cinthia Mijares, Business Development Manager, ULEMCo
- ☛ Stuart Gardiner, Operations Director, Hydrasun



Please visit the registration page from QR /URL for the webinar
https://deloitte.zoom.us/join/register/WN_bFP1X44CRwqcvfeAJ2pg5w

Hydrogen Twin Cities: H2 Aberdeen - Hydrogen is Here includes 4 speakers from both public and private sector organisations in Aberdeen that continue to support different aspects of the city's Hydrogen transport journey.

The webinar will provide a detailed overview of Aberdeen's transport fleet, how vehicles are procured and utilised as well as provide information on the infrastructure available in the city to support H2 transport. Attendees will also hear about H2 transport solutions and vehicle conversion as well as supporting skills services available in Aberdeen.

Supported by



Webinar - Kobe City



Hydrogen Twin Cities: H2 Kobe - Hydrogen is Here



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Tuesday
30 January 2024
8:00-9:30 (GMT)

Title :

Kawasaki Hydrogen Road
-International Liquefied Hydrogen
Supply Chain-

Speakers :

Kawasaki Heavy Industries, Ltd.
Marketing Promotion dept.
Hydrogen Strategy div.
Yuichiro YAMADA (Mr.)



Photo credit: HySTRA



Please visit the registration page from QR /URL for the webinar
https://deloitte.zoom.us/join/register/WN_Th7ixRgSxWjIE49J_cdrA#registration

To utilize clean hydrogen as a common source of energy, we need to develop robust supply chain of hydrogen, which is financially feasible at the same time.

This webinar hosted by Kobe City will talk about the "Demonstration Project for Establishment of Mass Hydrogen Marine Transportation Supply Chain Derived from Unused Brown Coal" which is being implemented in Kobe to establish a flow of producing, transporting, and storing hydrogen.

Supported by



>100 audience for each webinar

From UK, EU, Japan, Taiwan, SE Asia, South Africa

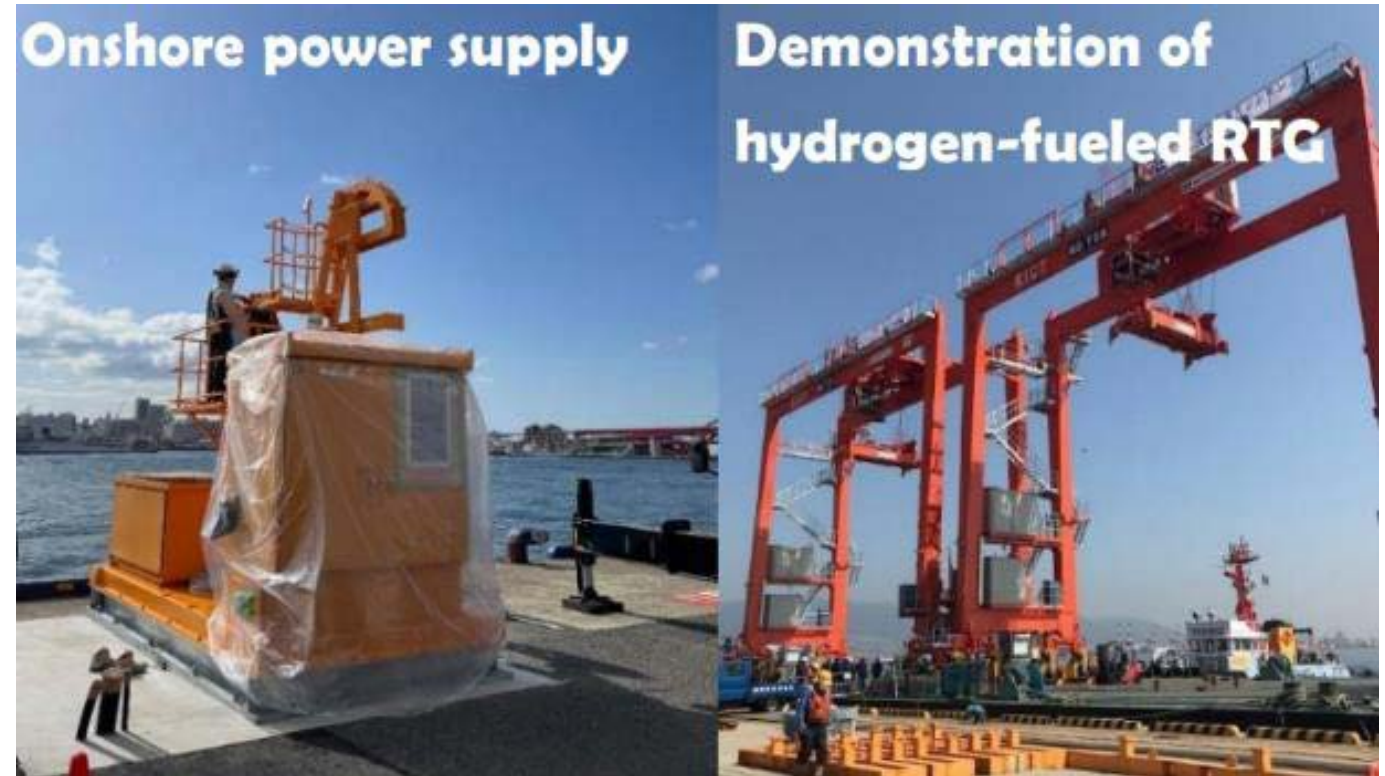
Supporting B2B Connections

Webinar recordings



Fliers designed by Deloitte Thomatsu Consulting / METI

Recent & Future Hydrogen Activity in Kobe City

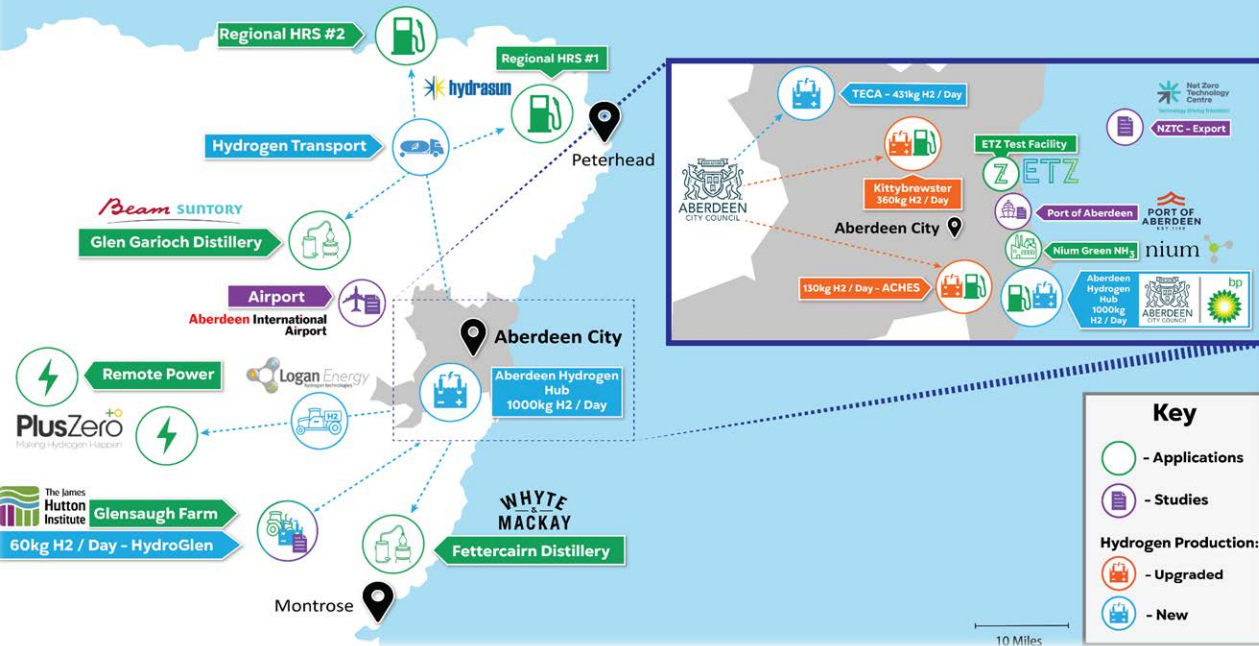


KOBE 
CITY of DESIGN

Recent & Future Hydrogen Activity in Aberdeen

Aberdeen Hydrogen Hub

TH2ISTLE Hydrogen Valley Up To 2030



An integrated energy partnership

Accelerating progress in our cities through collaboration



Thank you from Michito Aoi (energy@office.city.kobe.lg.jp) and Robin Dillaway (rdillaway@aberdeencity.gov.uk)





Pacific Hydrogen Alliance (PHA) Program Overview

(formerly known as the “H2 – TRANS – PACIFIC” Team)

Presenter: Lex Heslin, PHA Program Manager



Team Overview

Pacific Hydrogen Alliance

- City of Lancaster, California, USA (Mentor)
- Namie Town, Fukushima, Japan (Mentor)
- County of Hawai'i, State of Hawai'i, USA (Mentee)

Partner

- ENSO Infrastructure LLC (Program Manager)

Announced at COP 27 in Egypt, Nov. 2022

Renamed the Pacific Hydrogen Alliance (PHA) in MOU signed by three mayors in May 2023






PHA Video Intro






Hydrogen Background






Lancaster

-  Hydrogen production: Renewable H₂ (solar)
-  Infrastructure: H₂ microgrids, H₂ gas and liquefaction
-  End use: Buildings, Parris Center H₂ EMS + fueling, behind-the-meter H₂ community

Namie

-  Hydrogen production: 10-MW H₂ electrolyzer (solar)
-  Infrastructure: Large storage tanks, H₂ station, mobile
-  End use: FCs, H₂ cars, bus, forklifts, factory, pipelines

Hawai'i

-  Hydrogen production: Renewable H₂ (solar)
-  Infrastructure: Waste to H₂, fueling stations
-  End use: H₂ vehicles, H₂ buses (ramp up)



Priority Sectors

- Access to global technology
- Technology sharing
- Community education and understanding

Areas of Mutual Interest

- Collaborative models
- Policy influence
- Regulatory framework
- Best practices in H₂ production

Project Summary

- On-site visits to each location
- Exchange H2 market and company information
- Online monthly meetings to update partners on projects, and legal, regulatory, financial, and local supply and demand conditions
- Track metrics (GHGs, investment \$, community engagement, EJ40) and exchange best practices
- Strategies to promote economic development
- Professional Exchange Program (“PEP”)
 - Economic development
 - Attract investment from H2 companies to the cities
 - Promote the construction of hydrogen related plants
 - Collaborating with local industries to form a hydrogen supply chain
 - H2 Production → Distribution → Storage → Usage
 - Human resource
 - Develop H2 experts in U.S. and Japan partnership



Measures for Success

- Market creation (supply and demand) and aggregation for renewable hydrogen
- GHG impacts

Accomplishments / Planned Activities



Technology Acceleration and Outreach

- Exchange valuable technology and research
- Creating and advancing technology to allow for off-grid hydrogen production and use



Funding

- Increase grants and other funding to PHA
- Novel approaches using Public-Private Partnership structures



Jobs Creation

- Economic development – increase investment, jobs, taxes, living standards among partners
- Creation of FPH2 – first public H2 utility
- Continue recruiting H2 corporate professionals and investors for 2025–2026 PEP program (goal 5–6 companies)



DEI and Environmental Justice

- Provide “Living Lab” model of H2 city concepts to visitors from around the world
- Unique Hawai’i model

**‘ekahi
‘elua
‘ekolu
‘ehā**

Team Acknowledgements and Contacts

Thank you!

Contacts

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2023–2024 Program Round Winners



h2 Regional Energy Hub

Houston, Texas, United States (Mentor)
and Nuevo Leon, Mexico (Mentee)



Hy HouB

Houston, Texas, United States (Mentor)
and Barrancabermeja, Colombia (Mentee)



Houston–Nuevo Leon H_2 Regional Supply Chain Development

Presenter: Eduardo Sánchez, Director General, Renewable Energy Agency, State of Nuevo Leon



Team Overview

Project Lead: **Houston, Texas**

Mentor City

- Center for Houston's Future, an economic development focused nonprofit, leading development of the Gulf Coast clean hydrogen ecosystem



Project Lead: **Nuevo Leon, Mexico**

Mentee City

- The Renewable Energy Agency is committed to driving the energy transition in the state of Nuevo León, focusing on infrastructure, renewable energy, energy efficiency, human capital development, and cross-cutting projects.



Hydrogen Background

	Houston	Nuevo Leon
Production	Is a leading U.S. hydrogen producer, contributing 3.6 million tons per year, supported by abundant natural gas and renewable energy (wind and solar).	Plans to increase green hydrogen production from 48 kton (2020) to 295.6 kton by 2050, primarily for heavy industries like steel and cement. Projected CO ₂ reduction: 8,129 kton.
Infrastructure	Is developing hydrogen fueling stations for heavy-duty trucks and public transit buses, with plans for hydrogen storage and clean energy projects.	Hosts major hydrogen transport companies and industrial parks, aiming to be a hub for hydrogen production and export.
End Use	Is considering hydrogen-powered trucks to replace diesel ones at the Port of Houston, focusing on transportation and energy storage for a clean energy transition.	Plans to boost hydrogen use in heavy transport and fuel cell vehicle (FCEV) production by 2030. Key sectors include steel, refining, and energy storage.

Priority Sectors

- Local supply chain
- Hydrogen in industry and manufacturing processes
- Transportation
- Power plants and energy storage systems
- Skills development
- Equity and inclusion

Areas of Mutual Interest

- Supply chain integration
- Investment attraction
- Regulatory framework challenges
- Research and development
- Public awareness and community engagement



Project Summary

- The **H2 Twin Cities initiative** aims to develop a **collaborative framework** between **Houston, Texas, and Nuevo Leon, Mexico**, to advance **green hydrogen production and utilization**. Proposed activities include establishing **regulatory workshops**, optimizing **energy technologies**, fostering **market development**, and creating a **regional hub** for hydrogen projects.
- Each city will contribute through local **expertise, infrastructure, and stakeholder engagement** to ensure successful implementation.



Measures for Success

- **Increased Hydrogen Production:** Number of new hydrogen projects under development in the region
- **Infrastructure Development:** Investment in hydrogen-related infrastructure
- **Market Growth:** Number of companies adopting hydrogen as an energy source in Nuevo León and Houston
- **Stakeholder Engagement:** Stakeholder satisfaction surveys on collaboration and program progress
- **Training Programs Implemented:** Mexican national certification for competencies
- **Regional Collaboration:** Knowledge exchange measured in visits, seminars, and webinars between the two regions

Project Summary

- The project will utilize a coordinated approach involving bilateral workshops, joint research initiatives, and networking events to facilitate knowledge exchange and collaboration.
- Regular communication among stakeholders from both regions will ensure alignment on goals and progress tracking.

Contributions from Each Region/City

- **Houston:**
 - Assist Nuevo Leon in developing proposals for federal legislation related to hydrogen infrastructure
 - Organize workshops and networking events
 - Research collaborations
 - Infrastructure development
- **Nuevo Leon:**
 - Collaborate with local educational institutions to develop training programs and certification processes
 - Industrial transition from gray to green hydrogen
 - Identify business opportunities
 - Facilitate partnerships between public and private entities



Planned Activities



Regulation and Certification

Bilateral workshops will be held to establish a regulatory framework and certification process for green hydrogen technologies.



Efficiency and Technology Optimization

Workshops will be organized to share best practices in energy efficiency for both hydrogen production and industry applications.



Training Skills

Awareness of green hydrogen technology and career opportunities will be raised through collaboration with industry experts to design educational modules and organize certification workshops.

Status: NOVEMBER FIRST "HYDROGEN WEEK"

Planned Activities



Market Development

Market development involves identifying gaps, analyzing demand, and engaging stakeholders to foster collaboration. It includes organizing networking events to facilitate investment opportunities among Nuevo Leon, border states, and Texas in the hydrogen sector.



Regional Hub

Develop a roadmap for hydrogen projects in Nuevo Leon and Texas, identifying key milestones and sectors for deployment, while establishing public-private partnerships and facilitating financing connections.



Regional Hub

Incorporate gender equality and diversity into project planning to ensure equitable access to opportunities, while developing guidelines for tracking and reducing greenhouse gas emissions from hydrogen activities, emphasizing transparency and accuracy.

Team Acknowledgements and Contacts

Nuevo Leon

- Mr. Eduardo Daniel Sánchez Martínez , Director General, State Renewable Energy Agency, eduardo.sanchez@nuevoleon.gob.mx, +52-81-1880-8727
- Natalia de la Fuente Treviño, Director of Security and Energy Transition, natalia.delafuente@nuevoleon.gob.mx, +52-8182-56-9045

Houston

- Mr. Brett Perlman, Managing Director, Center for Houston's Future bperlman@futurehouston.org +1 281 686-1030





HyHouB Team Overview

Presenter: Kirk H. Waltz, Director, Business Development–Clean Energy Transition, American Bureau of Shipping



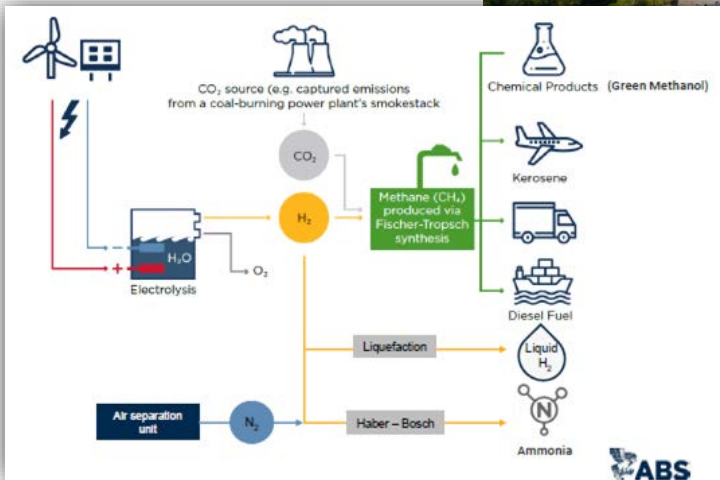
Team Overview

HyHouB

- **Houston, Texas, USA, Mentor**
- **Barrancabermeja, Santander, Colombia, Mentee**

Partners

- **American Bureau of Shipping (Mentor)**
- **Barrancabermeja Chamber of Commerce (Mentee)**
- **HyVelocity Hub (Knowledge Sharing)**
- **Blue Sky Maritime Coalition (Knowledge Sharing)**
- **Energy, Food and Water Nexus (Project Developer)**



Hydrogen Background

Houston, TX, USA

- Fuel cell electric trucks, industrial processes, ammonia, refineries and petrochemicals, and marine fuel (e-MeOH)
- 1,000+ miles of H₂ pipelines
- 33% of U.S. hydrogen capacity

Barrancabermeja, CO

- Interest in low emissions hydrogen, ammonia, methanol and sustainable aviation fuel (SAF), for oil refining, transport fuels and fertilizer industries.
- Largest refinery and fluvial port in Colombia
- Large biodiesel producer (138K Tpa, a potential methanol offtaker, currently importing it)

Priority Sectors

- Maritime and fluvial transportation
- Life cycle analysis of alternative fuels
- Safety considerations for port operations and multimodal transport
- Hydrogen production routes
- Hydrogen carrier molecules

Areas of Mutual Interest

- Low emissions industrial development policies in national, regional and municipal development plans
- Build industry and technology decarbonization roadmaps



Project Summary

- Knowledge sharing of industry best practices for hydrogen derivative production, transportation, and utilization Routes
- Webinars and blended (in person and virtual) working sessions:
 - ABS technical guidance, trainings, and industry partners collaboration



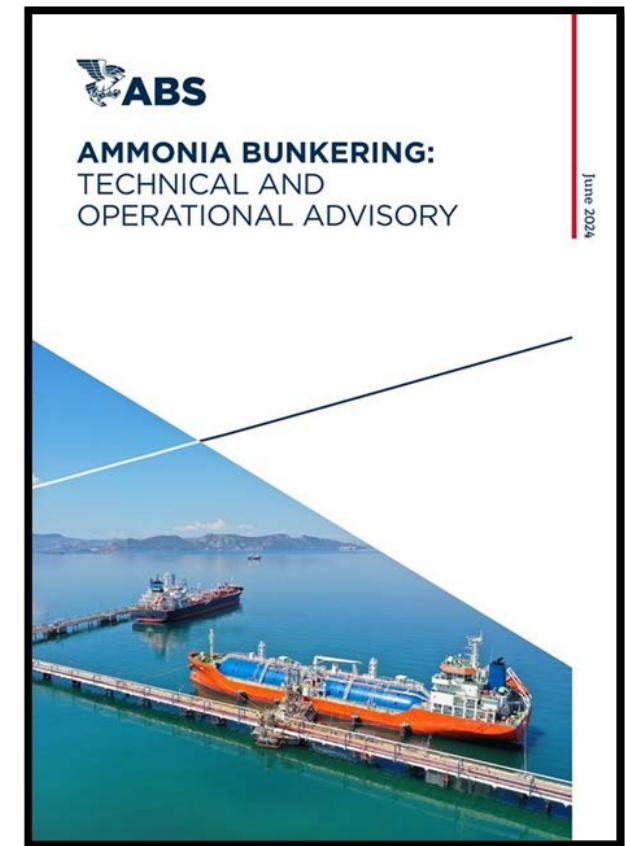
Measures for Success

Knowledge transfer participants from the community, government, industry, NGOs and academia	1266
Activities for the development of leadership skills to accelerate hydrogen adoption	19
Activities to prepare the mentee city for industrial scale hydrogen adoption projects (norms, standards, regulations, business models, partnerships)	43
Increased visibility for the twin cities, sponsors and partners through social media engagements	8600



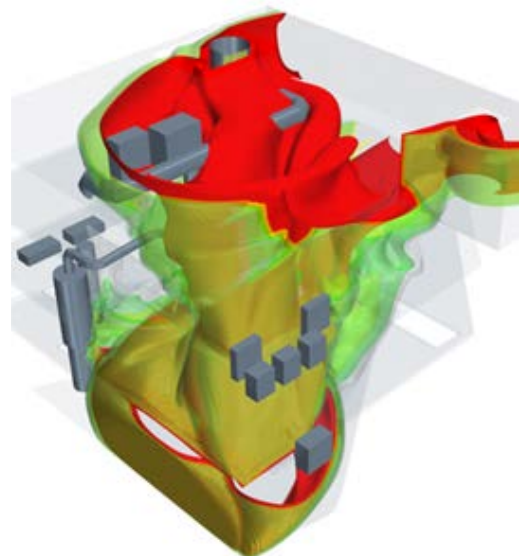
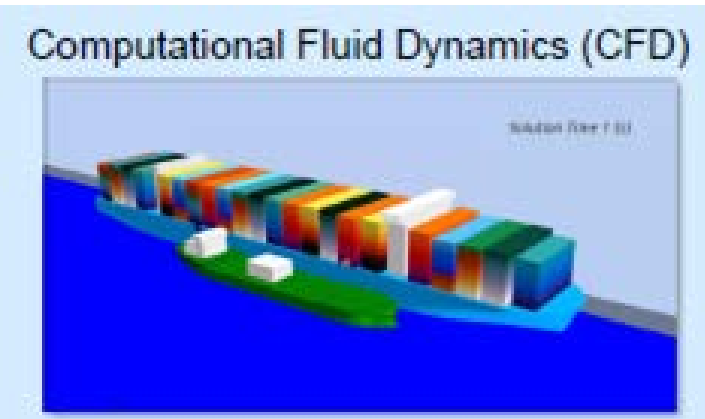
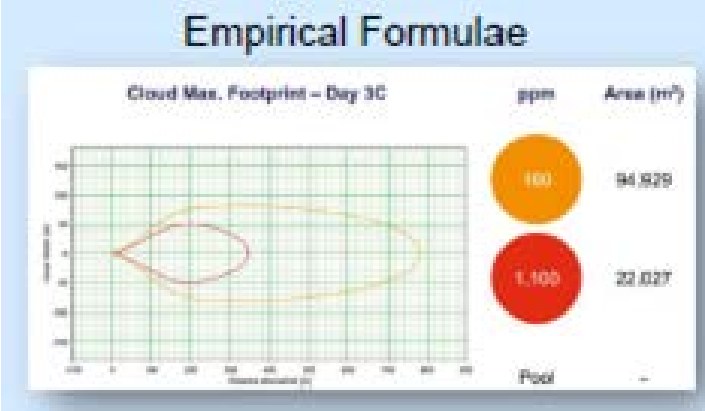
Hydrogen Derivatives Safety

- Sharing best practices for the marine transport of hydrogen carrying molecules



Hydrogen Derivatives Safety

- Risk Planning and Mitigation



Port and civilian
Emergency Plan
Evaluation

Dynamic Casualty
Analysis

Weather conditions
simulation

Port Resilience Assessment

Operational Level

Resource Allocation Optimization

- First responders (e.g. SCDF)
- Road blockages



Accomplishments / Planned Activities

- Communicated program results to support entities and the community, for early engagement.
- Award recipient institution NCAGE code obtained.
- Advancing towards having the award recipient institution registered in the SAM.gov platform.



Technology Acceleration and Outreach

- Activities on, among others:
- Transport and storage of H₂ derivatives
 - Vessel propulsion technologies
 - H₂ derivatives leak and flame detection
 - Emergency response



Emissions Reduction

- Life cycle emissions assessment of fluvial and maritime transportation with hydrogen derivatives, compared to conventional fuels



Jobs Creation

- Webinars or workshops on:
- H₂ supply chain business and job opportunities
 - Strategic alliances for training and reskilling
 - Inspectors
 - Port operators
 - Crews



DEI and Environmental Justice

- Webinars or workshops on:
- Low emissions hydrogen economy and inclusive employment opportunities
 - Diversity and inclusion programs for Hydrogen Hubs
 - Experiences and lessons learned

Team Acknowledgements and Contacts

The team would like to thank program sponsors, our partners, and supporting entities.

Contacts

- **Kirk Waltz**, Project kickoff and coordination – U.S. side, kwaltz@eagle.org
- **Andres Mantilla**, Project kickoff and coordination - Colombian side, EnergyTransition@ccbarranca.org.co
- **Ibrahim Muritala**, Technical guidance and execution, imuritala@eagle.org



HyVelocity Hub



prosantander



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Q&A

Thank You!

- Contact for general H2 Twin Cities inquiries:
h2twincities@nrel.gov
- www.energy.gov/eere/h2twincities

