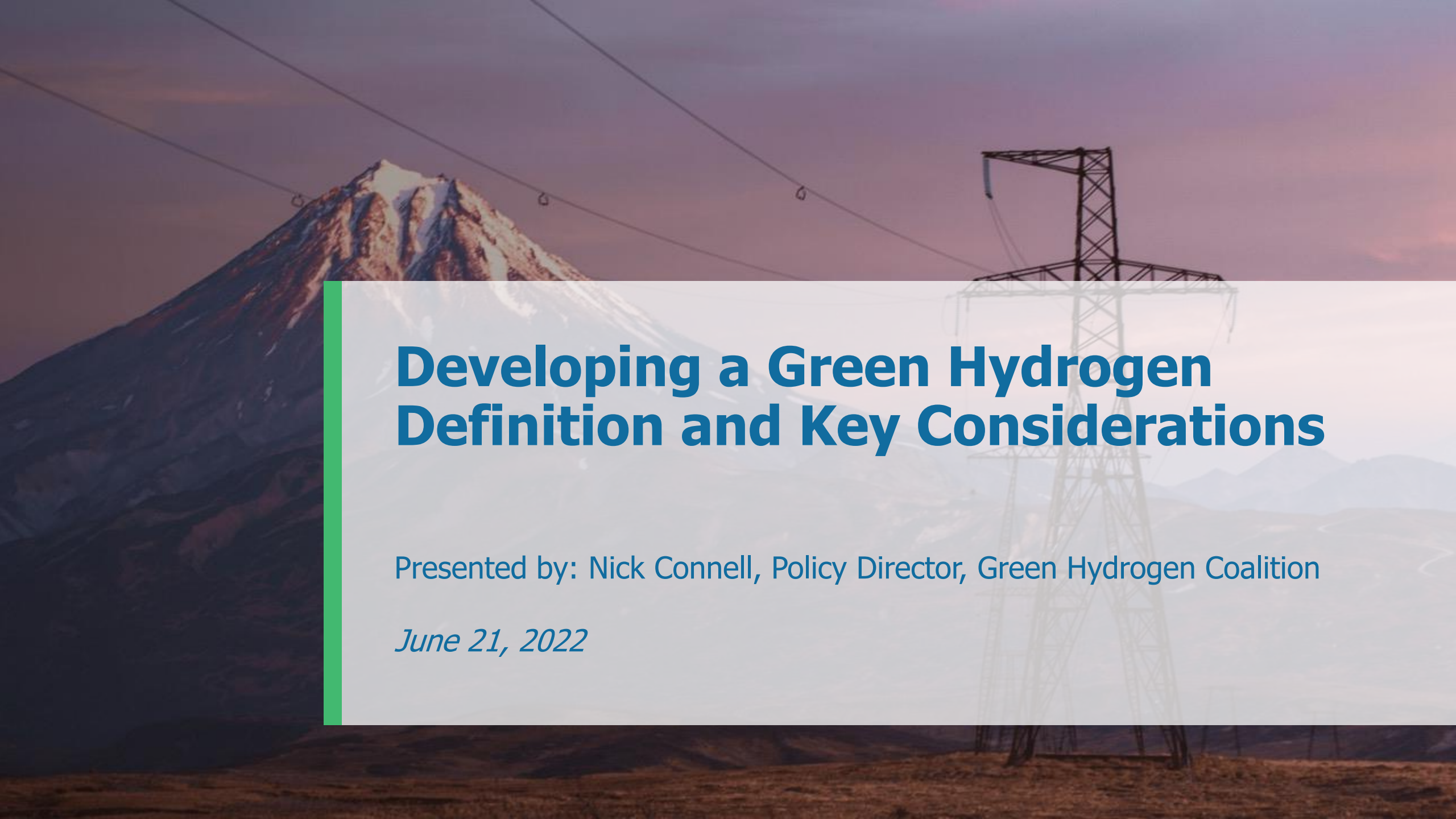
DOCKETED	
Docket Number:	22-IEPR-05
Project Title:	Emerging Topics
TN #:	243604
Document Title:	Presentation - Developing a Green Hydrogen Definition and Key Considerations
Description:	4E. Nicholas Connell, Green Hydrogen Coalition
Filer:	Raquel Kravitz
Organization:	Green Hydrogen Coalition
Submitter Role:	Public
Submission Date:	6/20/2022 11:53:57 AM
Docketed Date:	6/20/2022



Developing a Green Hydrogen Definition and Key Considerations

Presented by: Nick Connell, Policy Director, Green Hydrogen Coalition

June 21, 2022

GREEN HYDROGEN COALITION

About the GHC

Mission

Facilitate policies and practices to advance the production and use of green hydrogen in all sectors where it will accelerate a carbon-free energy future

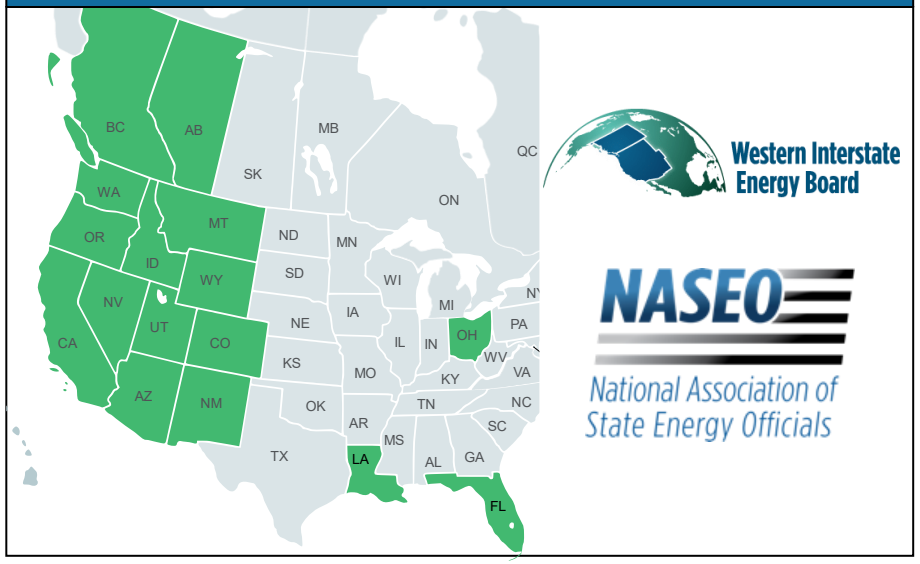
Approach

Prioritize green hydrogen project deployment at scale; leverage multi-sector opportunities to simultaneously scale supply and demand

***The GHC is a tax exempt 501(C)(3) nonprofit organization.**

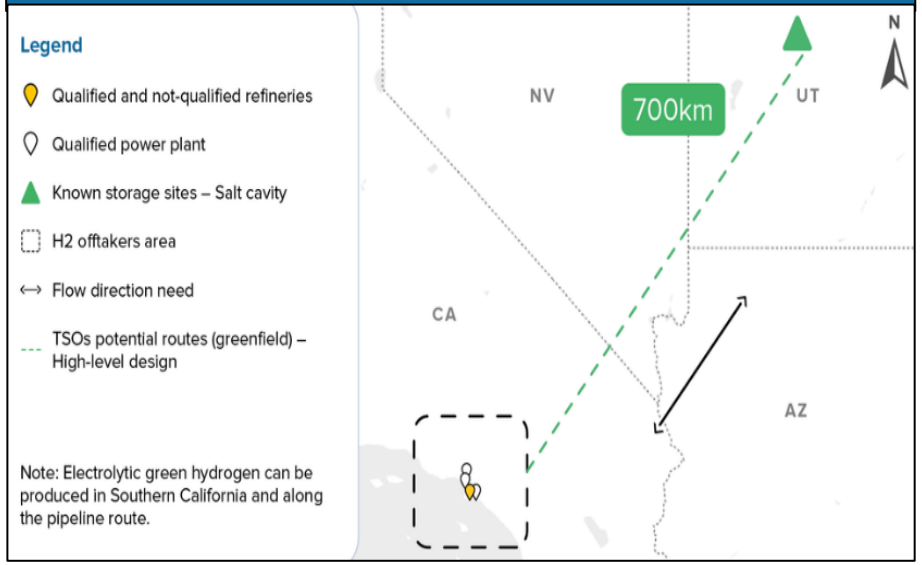
GHC launched 2 game-changing initiatives to drive policy and commercialization efforts that together will accelerate the North American green hydrogen market.

Initiative 1:
Western Green Hydrogen Initiative



Establish a regional green hydrogen strategy for the West by providing decision-makers with the information, tools, and policy support to deploy projects that advance energy reliability, decarbonization, and economic growth.

Initiative 2:
HyDeal North America



Develop high-volume supply chains to achieve $1.50/kg delivered green hydrogen costs in strategically targeted locations, starting in the Southwestern United States.

Increasingly, the proliferation of differing hydrogen shades is overly complicating the discussion. As a result, the GHC supports defining "green hydrogen" based on a carbon intensity framework.

Definition considerations

- Does it support non-fossil fuel feedstock diversity?
- Is it based on a quantifiable methodology?
- What is the hydrogen production CO2e threshold?
- Does it consider the lifecycle impacts?
- Does it support technology-neutrality?
- How will it be certified?

From complexity
(hydrogen colors)

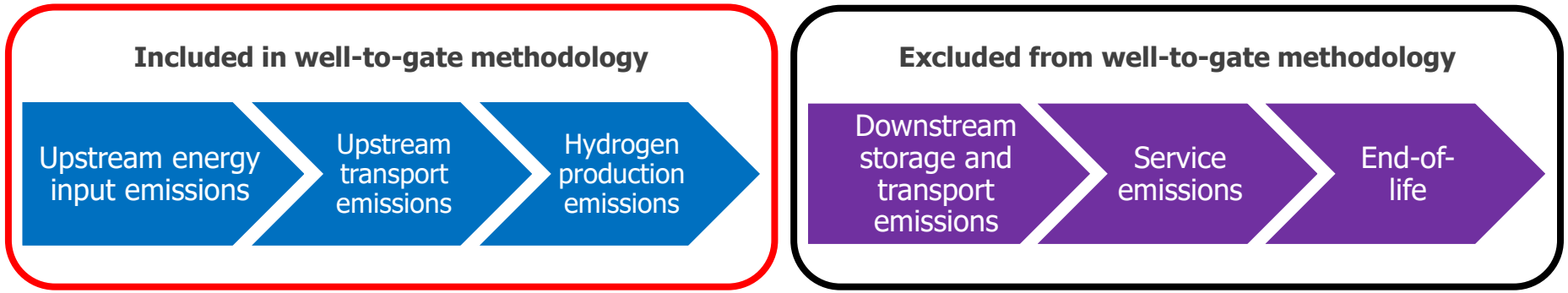
To one indicator based on CI
(e.g., kgCO2e/kgH2, gCO2e/MJ…)

- **A carbon intensity framework is a technology-neutral approach** to assessing the GHGs associated with hydrogen production. It opens the debate about competition between various hydrogen production routes that meet the required carbon intensity at the least cost.
- A carbon intensity framework can adopt a **threshold** and **certification scheme** to rigorously account for GHGs arising both at the site of production and upstream of production.

GREEN HYDROGEN COALITION

System boundaries are critical to defining green hydrogen when basing it on a carbon intensity framework. The GHC supports a "well-to-gate" lifecycle assessment to evaluate lifecycle emissions.

- The term 'well-to-gate' assessment evaluates the lifecycle emissions from feedstock through the point of production. This means emissions associated with upstream feedstock production, upstream transportation, and onsite hydrogen production.



"Well-to-Gate" system boundary

Source: International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE) "Methodology for Determining GHGs Associated with the Production of Hydrogen"

GREEN HYDROGEN COALITION

A carbon intensity framework is fundamental to establishing certification mechanisms and standards that can make or break early market growth.

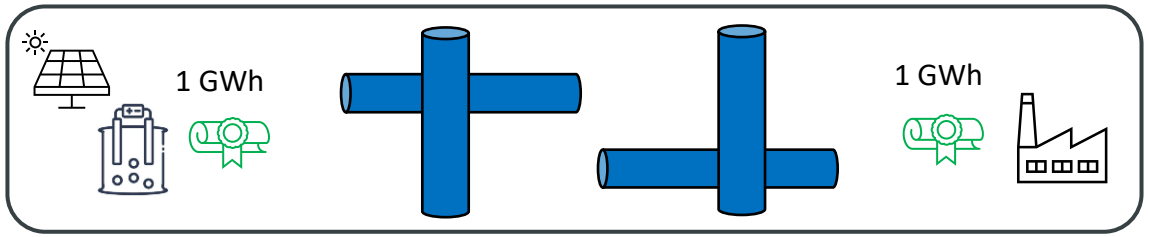
Certification considerations

- What accounting scheme will be used?
- Who is going to certify the hydrogen production?
- Who will oversee the process?
- Compatibility with renewable electricity certificates?

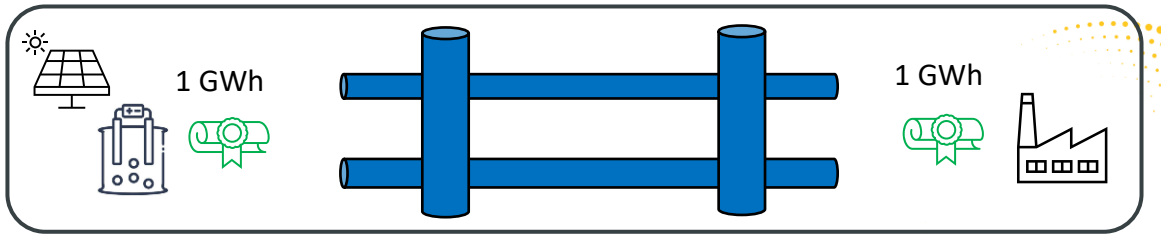
Market development considerations

- Is the H2 certification being held to a higher standard than other resources?
- Are the rules and requirements too restrictive for early development?
- How can we move the market to 'mass balancing' in time?

Book-and-claim (separate trade of certificate and commodity)



Mass balancing (physical link between all stages)



GREEN HYDROGEN COALITION

It is important that mechanisms ensure that green hydrogen is genuinely green. However, today's infrastructure/mechanisms to achieve 'mass balancing' is not yet mature.

- In the near-term, GHC supports leveraging existing infrastructure and systems that have worked for decades in the renewable electricity and gas markets to accelerate green hydrogen market development.

Near-term (current – late 2020s)

"Book-&-Claim" principle allows certificates to be traded separately from the physical product

- Helps ramp-up phase of H2 market
- Allows for flexibility for producers and end-users
- Increases competition
- Addresses near-term barriers due to lack of built infrastructure

Long-term (late 2020s – beyond)

"Mass Balancing" principle links the certificate with the respective delivery

- Able to trace renewable energy to use
- A physical link is established throughout the value chain
- Supports additionality and physical delivery
- Establishes a temporal correlation
- Reduces resource shuffling

GREEN HYDROGEN COALITION

There are four requirements that green hydrogen tracking systems should comply with. Compliance should only be required when commercial implementation is possible.

Temporal correlation: Green hydrogen tracking systems should operate on an appropriate time interval that will both meet the demand and support the establishment of future power purchase agreements, as well as include available production forecasts.

Geographical correlation: Green hydrogen tracking systems should require some degree of a physical link to ensure that the energy input is involved in the process of producing hydrogen that is claimed to be green.

Additionality for electrolytic applications: electrolytic green hydrogen development should contribute to the build-out or financing of new renewable electricity capacity, to avoid its development leading to increased shares of fossil-generated electricity elsewhere in the electricity system. However, the current market is nascent – therefore, a transitional period should be allowed during which the electrolyzer used to produce the hydrogen is enabled to take electricity from existing renewable sources, backed by RECs.

Technological specifications: It is essential that specifications provide full transparency and information on the resource used to produce the electricity, biogas, or biomass, and ensure its renewable nature.

GREEN HYDROGEN COALITION

Source: IRENA Coalition for Action (2022), Decarbonising end-use sectors: Green hydrogen certification, International Renewable Energy Agency, Abu Dhabi.

Contact Us

Nick Connell
POLICY DIRECTOR

nconnell@ghcoalition.org

(949) 558-1305

GREEN HYDROGEN COALITION