

# HYDROGEN & AMMONIA CERTIFICATION SCHEMES



ASIA PACIFIC  
**GREEN  
HYDROGEN  
2024**  
CONFERENCE & EXHIBITION

**10 - 12** JUNE  
2024

BORNEO CONVENTION  
CENTRE KUCHING, SARAWAK

Arthur Liu



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# Hydrogen Industry Main Challenge



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Why has hydrogen become a hot topic :

## Industrial hydrogen

- | In 2022, global demand for hydrogen was 94 million tons
- | Today 96% of hydrogen is produced **from fossil energies** (methane, oil, coal) and **used in industry** (oil refining, production of ammonia, methanol & chemicals).
- | This production produces **large quantities of CO<sub>2</sub> emissions** (> 10 tons CO<sub>2</sub> per ton of H<sub>2</sub>).

## Hydrogen energy



- ' Hydrogen can be produced through **water electrolysis** using renewable electricity, with almost no CO<sub>2</sub> emissions.
- ' It can allow to store intermittent renewable power surplus and is seen as **a mean to decarbonize the energy system**.
- ' As it does not emit CO<sub>2</sub> when burnt, **hydrogen can help to decarbonize** industry and heavy mobility sectors.

**Value of Hydrogen and derivatives (such as Ammonia) will mostly depend on sustainable and environmental attributes**

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## HYDROGEN INDUSTRY DEVELOPMENT ROADMAP



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## 1. REGULATION UNDER DEFINITION

- | **No common definition** of what is renewable and low carbon hydrogen
- | Building a global consensus will take time
- | Local regulations emerging



## 2. LACK OF TRUST

- | **Lack of visibility** both for developers and investors
- | **Lack of trust** from off-takers
- | Issues for cross-border trading



## 3. INDUSTRY'S DELAY

- | **Delays in investment decisions** making
- | Ramp up of production capacities is slowed



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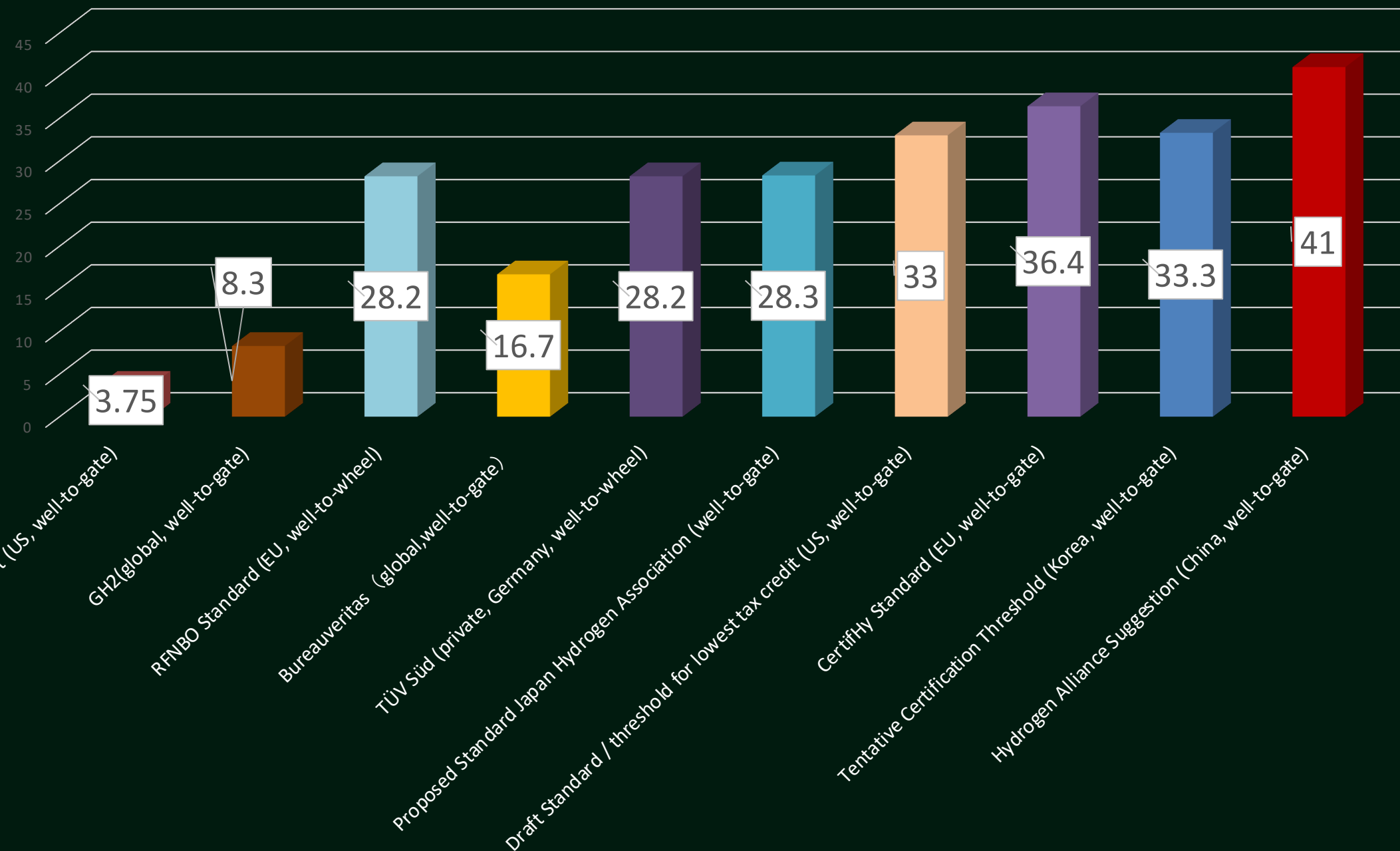


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Certification thresholds for clean/green hydrogen (gCO<sub>2</sub>eq/MJ)



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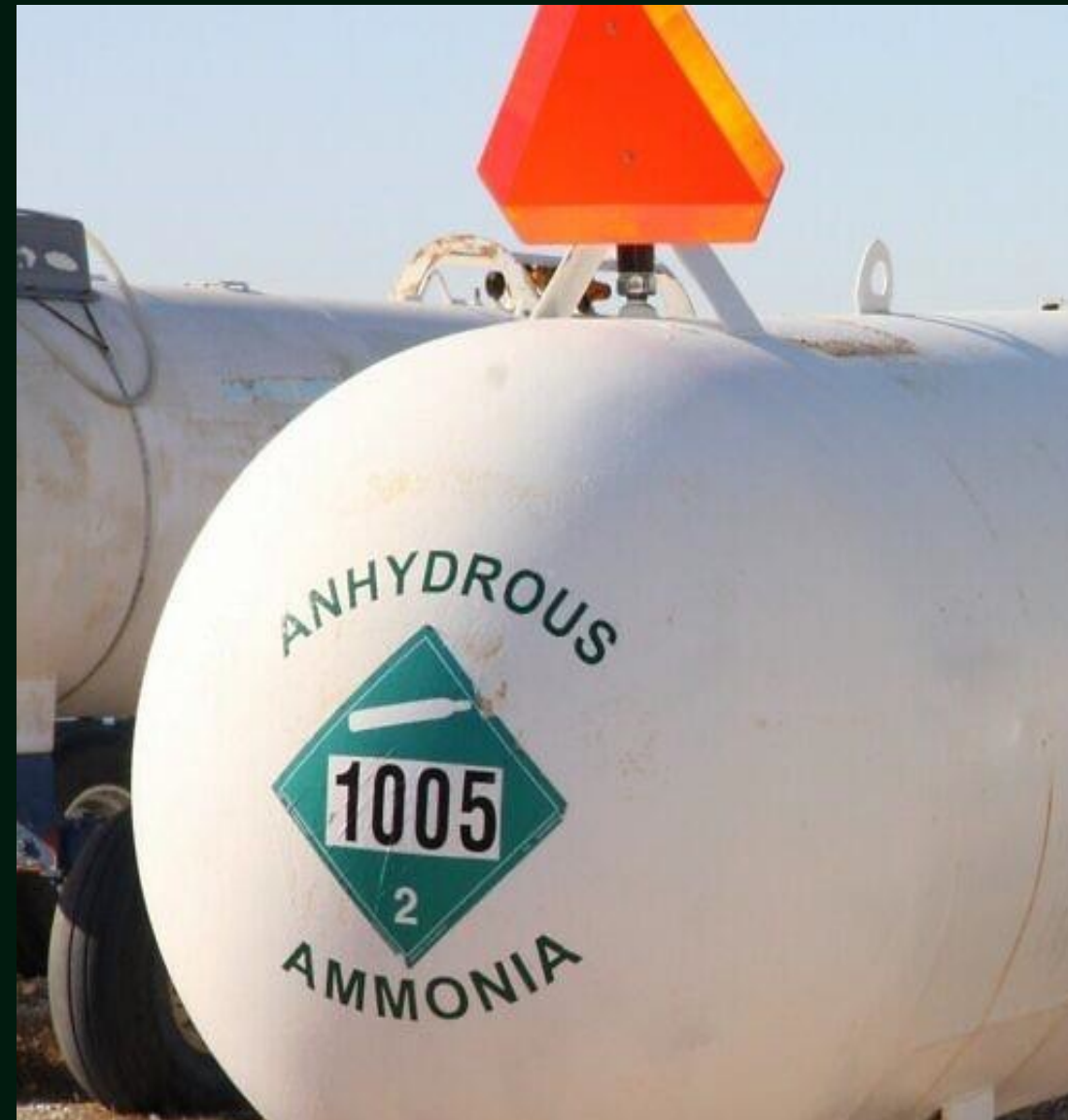
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## WHAT IS IT ABOUT?

- | In January 2023, BV launched a voluntary **CERTIFICATION** and **LABEL** scheme for **Renewable Hydrogen**.
- | Most of large-scale projects anticipate **conversion of Hydrogen into Ammonia**, which is easier to store and transport on long distances
- | BV has replicated its Renewable Hydrogen scheme to Ammonia, being a **First Mover in Renewable Ammonia Certification**
- | As for Hydrogen, **CERTIFICATION** addresses the **asset** and **LABEL** is delivered for the molecule



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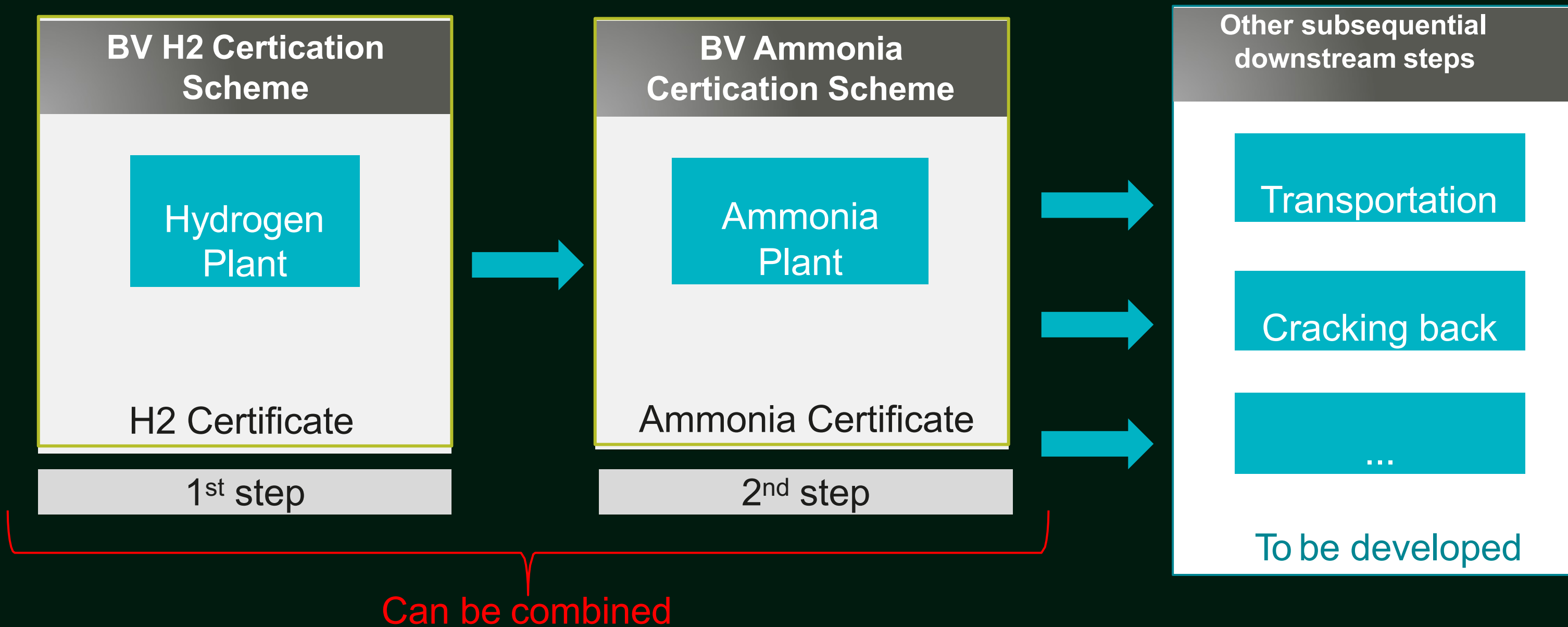
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SEQUENCE OF HYDROGEN & AMMONIA SCHEMES 10 - 12 JUNE 2024

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## UNIQUE SCHEME RELYING ON 3 PILLARS 10 - 12 JUNE 2024

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1



### SAFETY

- | Compliance with safety standards
- | Application of best practices
- | Process safety from design and construction until operations

2



### SUSTAINABILITY

- | Water footprint
- | Assessment of sustainability through ESG criteria
- | Environmental impact

3



### RENEWABLE INPUT

- | 100% renewable electricity
- | Overall carbon footprint below **2kg CO<sub>2</sub>eq / kg H<sub>2</sub>\***  
**0,5kg CO<sub>2</sub>eq / kg NH<sub>3</sub>\***

\*capital goods excluded



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## A CERTIFICATION PROCESS IN 3 STEPS

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### BV RENEWABLE H<sub>2</sub>/NH<sub>3</sub> CERTIFICATION SCHEME

1

#### At Design Stage CERTIFICATE

Certificate of Conformity  
- no surveillance activities -

LCA  
Safety  
ESG

Purely remote  
assessment  
based on  
documents

2

#### At Operational Stage CERTIFICATE

3 years validity period  
- with annual surveillance audits -

LCA  
Safety  
ESG

Combined  
remote &  
on-site  
assessment

3

#### At Operational Stage LABEL

1 year validity  
- with quarterly remote audits -

Remote audit  
of Renewables  
input vs. H<sub>2</sub>  
output

**Remark:**  
Valid BV certificate of operational plant as  
prerequisite

Asset life cycle – Renewable H<sub>2</sub>/NH<sub>3</sub> Certificate plant based

Renewable H<sub>2</sub>/NH<sub>3</sub> Label quantity based



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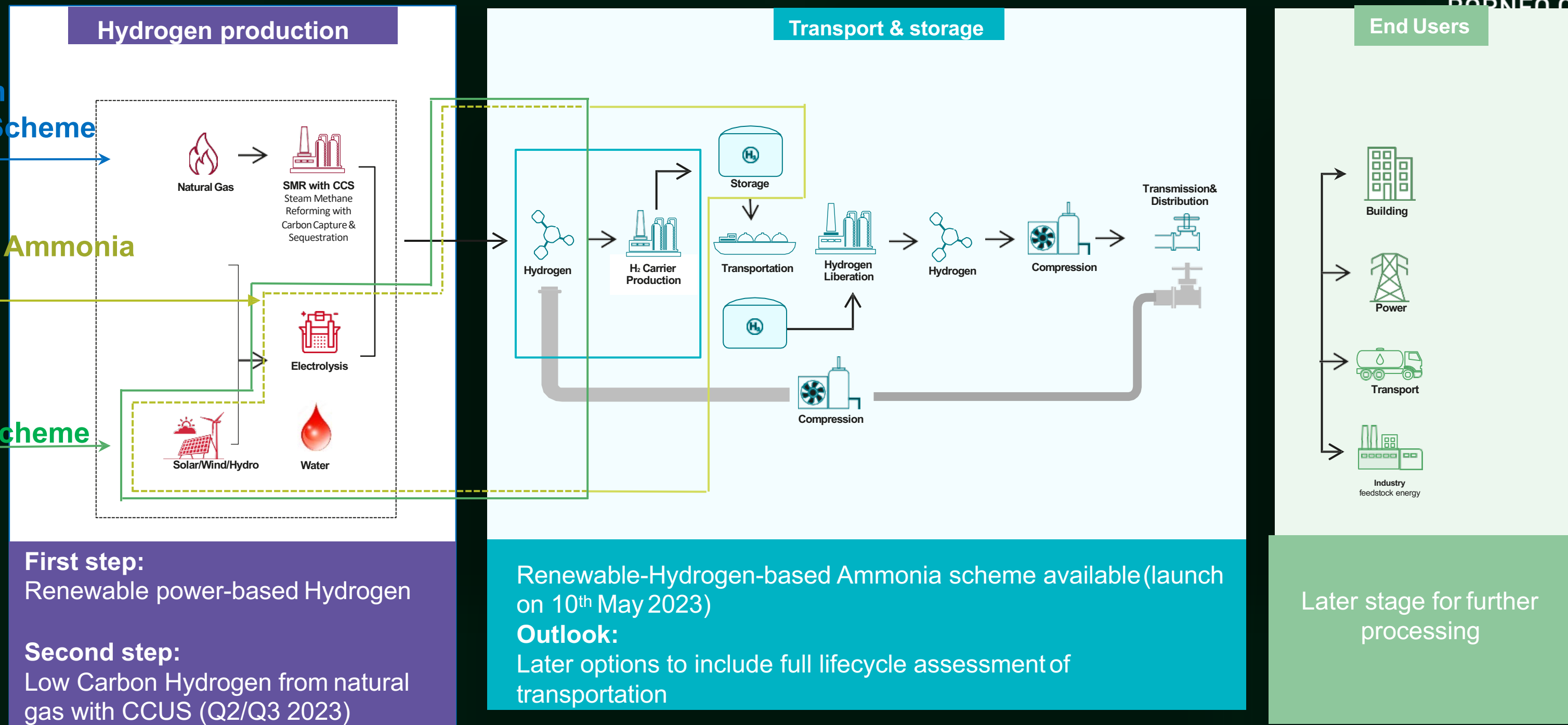
## ASSESSMENT SCOPE: A "WELL TO GATE" APPROACH

### HYDROGEN VALUE CHAIN

Low carbon  
Hydrogen Scheme

Renewable Ammonia  
Scheme

Renewable  
Hydrogen Scheme



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## ADDED VALUE FOR HYDROGEN INDUSTRY

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**Overall value of certification is 2-fold:**

- | Valuation of environmental attributes
- | Compliance check toward local or end-use market regulation

### DEVELOPERS

- | Providing credibility
- | Bankability of projects

### OFF-TAKERS

- | Increase confidence
- | Fostering the transaction
- | Allowing to transfer the “green” value proposition

### PRODUCERS

- | Securing business case
- | Fostering off-take
- | Retaining the “green” value proposition

### ASSETS INVESTORS/ FINANCERS

- | Selecting bankable & ESG compliant projects to invest in



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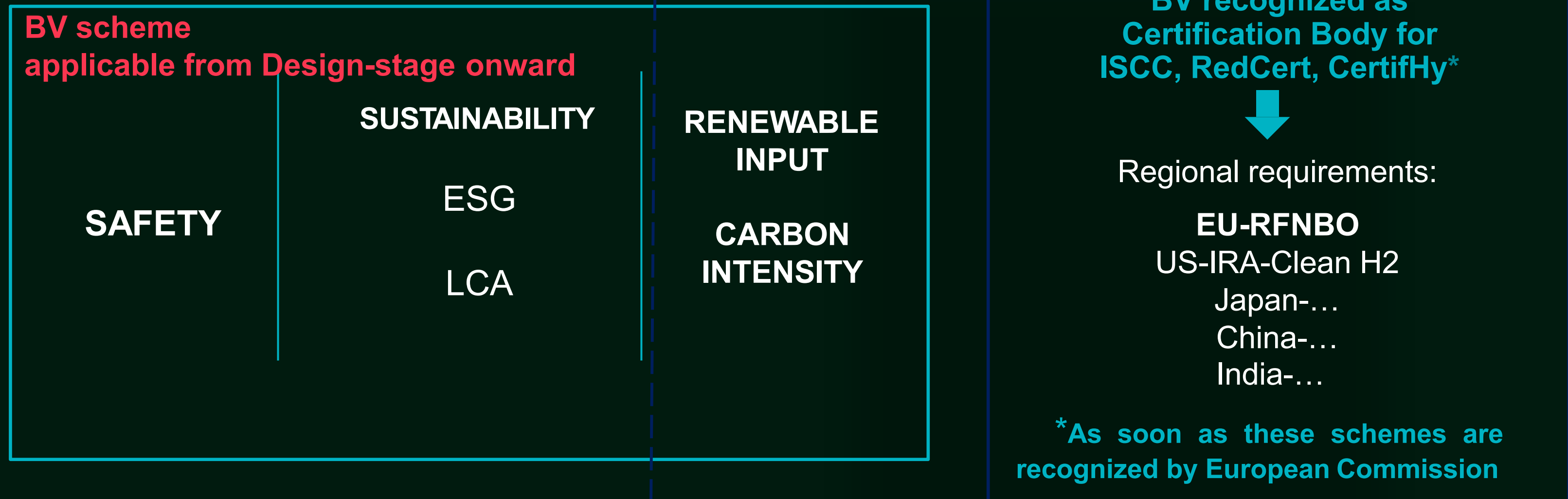
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## HOW TO DELIVER REGULATORY COMPLIANCE



➔ Once regulatory requirements are fixed, compliance assurance can be combined with BV Schemes



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**REMINDER:** to date,  
there is NO GLOBAL  
STANDARD or definition  
for hydrogen production  
requirements

Regulatory compliance is  
a BIG CONCERN for  
Hydrogen & Derivatives  
developers and off-  
takers

Compliance will be  
**assessed in**  
**combination with BV**  
**scheme** either to local  
and/or to end-market  
regulation



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# BUREAU VERITAS POSITIONNING ON HYDROGEN: BRINGING TRUST AND TRANSPARENCY

With our long-standing experience in the energy industry, especially in **risk & safety management** and **quality assurance**, our overarching role is to **bring trust** to the hydrogen energy industry.

## As an independent third party:

- | Certification of assets
- | Certification of equipment
- | Supply chain quality assurance
- | Independent testing and measurement

## As a technical expertise provider:

- | Owner's engineer
- | Technical advisory
- | Permitting support
- | Risk & safety management



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