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# GLOBAL HARMONISATION OF HYDROGEN CERTIFICATION

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# WHY HARMONISE STANDARDS FOR RENEWABLE HYDROGEN?

**Status Quo:** Currently, there is a variety of hydrogen standards globally. This means **less flexibility** for producers to address different **international markets** and **less liquid markets** in the future, leading to **inefficiencies** and possibly a slower market-ramp up

**Hypothesis:** Harmonised requirements enable a **global certification system**

**Research question(s):** What would it take to harmonise requirements? What is a „**common denominator**“ enabling suppliers to address different markets?

**Method:** We assessed **eleven hydrogen regulations/ standards** in terms of their **potential for harmonisation**

# CERTIFICATION GOVERNANCE

- Certification systems **mirror the legislative framework** of national markets
- Certification is an essential tool for **demonstrating compliance** with the regulatory framework of **state aid** provision in form of subsidies, tax/levy exemptions, or getting the hydrogen volumes counted towards national renewable energy targets

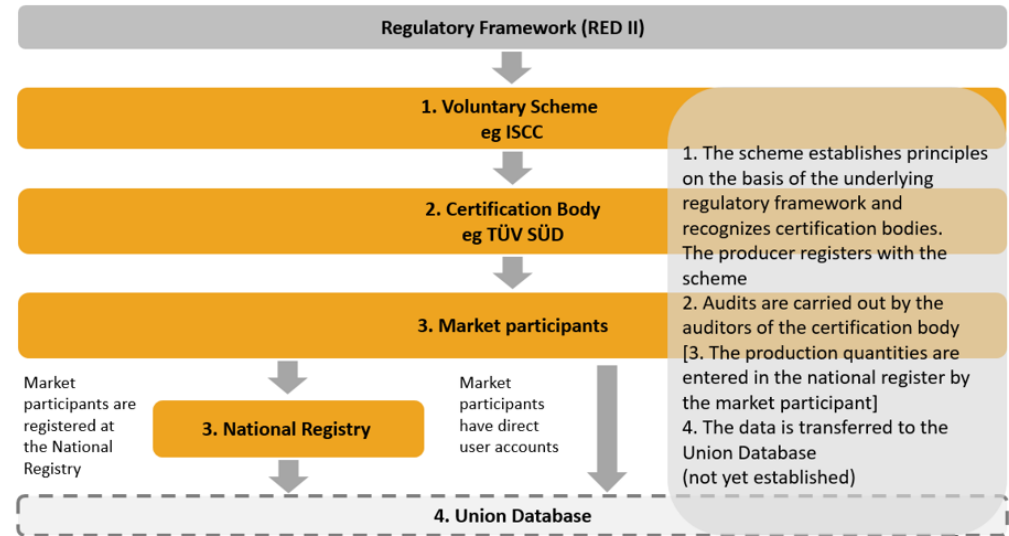


Figure 1: PoS certification process and competent bodies (modified from REGATRACE D4.1. (2021))

# POTENTIAL FOR HARMONISATION (1/3)

Sustainability criteria for powerfuels	Schemes							Funding Programme	Regulations		
Regulation/standard	ISCC PLUS	CertifHy	dena Biogas-register	TÜV Süd CMS 70	China Hydrogen Alliance' Standards	Certification Scheme	Zero Carbon Certification Scheme	H2 Global	LCFS	RED II	RTFO
Market	EU	EU	DE	DE	CN	JP	AU	DE	USA/CA	EU	UK
Purpose	v	v	r	v	n/a	v	v	r	r	r	r
Renewable electricity	+	+	+	+	+	+	+	+	+	+	+
Tracking models	MB	B&C	MB	MB; B&C	n/a	B&C	MB	MB	B&C	MB	MB

v= voluntary; r= regulatory; B&C= Book & Claim; MB= Mass Balance

# POTENTIAL FOR HARMONISATION (2/3)

Sustainability criteria for powerfuels	Schemes							Funding Programme	Regulations		
Regulation/standard	ISCC PLUS	CertifHy	dena Biogasregister	TÜV Süd CMS 70	China Hydrogen Alliance's Standard	Certification Scheme (Japan)	Zero Carbon Certification Scheme	H2 Global	LCFS	RED II	RTFO
Market	EU	EU	DE	DE	CN	JP	AU	DE	USA/CA	EU	UK
GHG emissions	Well-to-Wheel	Well-to-Gate	According to demand	Well-to-Wheel	Well-to-Wheel	Well-to-Gate	Well-to-Gate	Well-to-Wheel	Well-to-Wheel	Well-to-Wheel	Well-to-Wheel
Eligible carbon sources	+	tbu	+	Out of Scope	Out of Scope	n/a	+	+	+	Pending delegated Act	+

# POTENTIAL FOR HARMONISATION (3/3)

Sustainability criteria for powerfuels	Schemes							Funding Programme	Regulations		
Regulation/standard	ISCC PLUS	CertifHy	dena Biogas-register	TÜV Süd CMS 70	China Hydrogen Alliance' s Standard	Certification Scheme	Zero Carbon Certification Scheme	H2 Global	LCFS	RED II	RTFO
Market	EU	EU	DE	DE	CN	JP	AU	DE	USA/CA	EU	UK
Land use change	+	-	-	-	-	-	-	+	+	-	-
Water consumption	+/-	-	-	-	-	-	+/-	+/-	+/-	+/-	-
Social impact	+	-	-	-	-	-	-	+	+	-	-

+ = the criteria covered; - = the criteria is not covered; +/- = The topic is mentioned, but no actual criteria is implemented

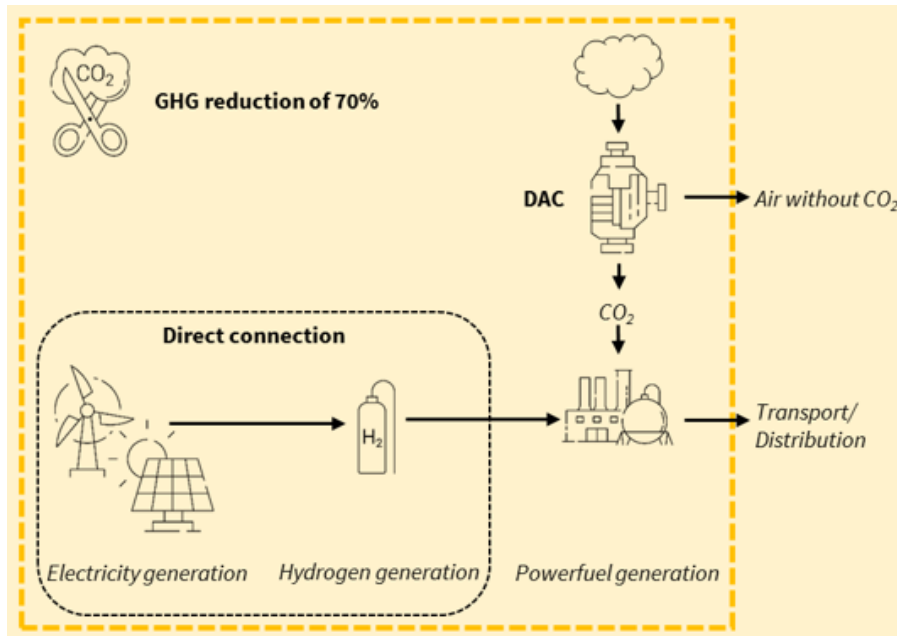
# HARMONISATION POSSIBILITIES OF SUSTAINABILITY CRITERIA

The most harmonised sustainability requirements are the use of **renewable electricity inputs**, **mass balancing** as the tracking model as well as the **eligibility of all carbon sources** as long as they are not deliberately produced for the synthetic fuel production.

- **Global recognition of certification bodies** in order to conduct the audits
- **Reliability and trust** towards hydrogen standards, certification schemes, and certification bodies of different markets
- **Robust mechanisms for avoidance of double counting/claims**
- Certificates from different schemes must be comparable and **recognised on different markets** (e.g. standardised data fields).
- **Harmonisation of the certification governance**



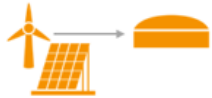

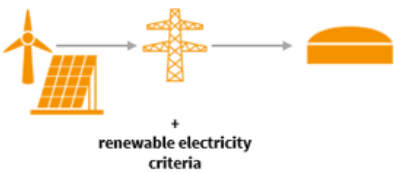
# THOUGHT EXPERIMENT: A PLANT CONCEPT WITH THE LARGEST GLOBAL OFFTAKE MARKET\*



- **Direct connection** between the renewable power source and the electrolyser
- **GHG reduction of 70%** compared to a fossil baseline
- **Carbon source: Atmospheric (DAC)**

\*Proof for mass balance needs to be provided along the value chain

# OTHER PLANT CONCEPT ELIGIBLE FOR DIFFERENT MARKETS

	Hydrogen plant concept	Hydrogen standards/regulations to demonstrate compliance
Direct connection		All assessed hydrogen standards & regulations
Indirect connection		China, Japan, Australia, CA/USA
Indirect connection + renewable electricity criteria		ISCC Plus, CertifHy, dena biogasregister, TÜV Süd CMS 70, H2Global, RED II, UK

# CONCLUSION

- The most harmonized sustainability requirements are the **use of renewable electricity inputs**, **mass balancing** as the tracking model as well as **the eligibility of all carbon sources** as long as they are not deliberately produced for the powerfuel production.
- **Currently, a harmonised global certification scheme seems out of reach**, because for some regulations/standards that would mean to give up on the most ambitious requirements, such as the renewable electricity criteria according to RED II Art.27.
- ...but, we can propose a plant concept which complies with all eleven hydrogen regulations/standards: **direct connection** to the renewable electricity plant, a **70% GHG reduction** compared to the reference value, and **carbon from DAC**. The chain of custody must be traced via **mass balancing**.

# DENA ACTIVITIES REGARDING HYDROGEN CERTIFICATION

## STUDIES



## PLATFORMS AND ALLIANCES



Report on Hydrogen Certification in Australia, Germany and Japan



# THANK YOU

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