

# *HIF Global*

*eMethanol project development and Methanol-to-Jet as a downstream processing option*

**Dr.-Ing. Timo Wassermann**  
**Chief Technology Officer**  
**HIF EMEA**

**November 6, 2024 – aireg Webinar**



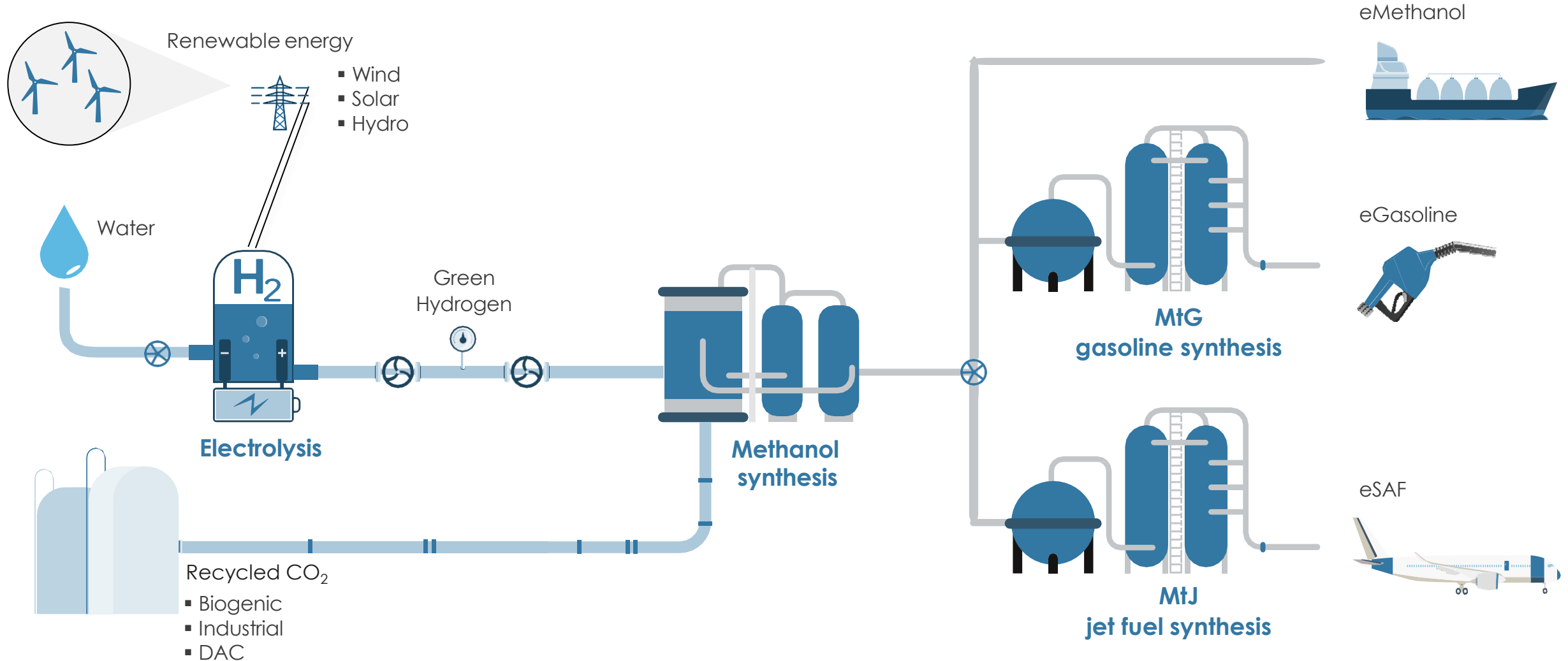
# How the HIF idea originated



**Strong winds throughout the year: Capacity factor ~70%  
(Average 2022 in Germany<sup>1</sup>: ~20%)**

# HIF's eFuel production process

The methanol route: Maximizing flexibility, optionality, resilience



# Methanol-to-Jet: Introduction



## Fundamentals

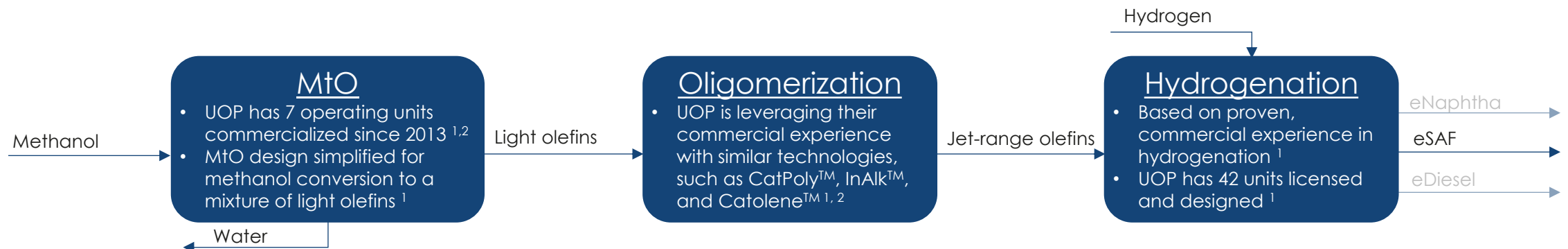
- Methanol-based middle distillate synthesis was first demonstrated by Mobil in the early 1980s
- Today's licensor landscape includes



## Process sequence

1. **Methanol-to-Olefins (MtO):** Methanol is converted over a catalyst to light olefins and water, the latter is discharged
2. **Oligomerization:** Light olefins are converted over a catalyst to jet-range, branched molecules
3. **Hydrogenation:** Olig.-products are hydrogenated for saturation of olefins to meet the jet specification
4. **Fractionation:** A final column separates jet fuel from minor naphtha and diesel by-products

## HIF selected UOP's eFinishing™ technology for its US e-SAF project



<sup>1</sup> Leigh Abrams & Timo Wassermann. 2024. Honeywell UOP and HIF Global are Powering an eFuels Future. Milan. GET Congress.

<sup>2</sup> Honeywell UOP. 2023. UOP-eFinishing-Datasheet v1.1. online.

# Advantages of the methanol route to eSAF



- ✓ Direct use of  $H_2/CO_2$  for MeOH synthesis and no need for RWGS
  - ✓ Load flexible operation of MeOH synthesis
  - ✓ Intermediate methanol can be stored and transported in liquid state
  - ✓ Option to separate MeOH synthesis and downstream processing
  - ✓ High yield & selectivity towards target product eSAF
  - ✓ Intermediate eOlefins are interesting product for chemical industry
- ! Current challenge: Pending ASTM certification

# HIF Global

We are fueling the world with renewable energy!



Commercial scale eFuels facilities planned for 2035

12

eFuels production capacity planned for 2035 (as eSAF)

8 billion Lpa

Development funding secured by Sept. 2024

\$480 million

Global employees

>150

Equity partners

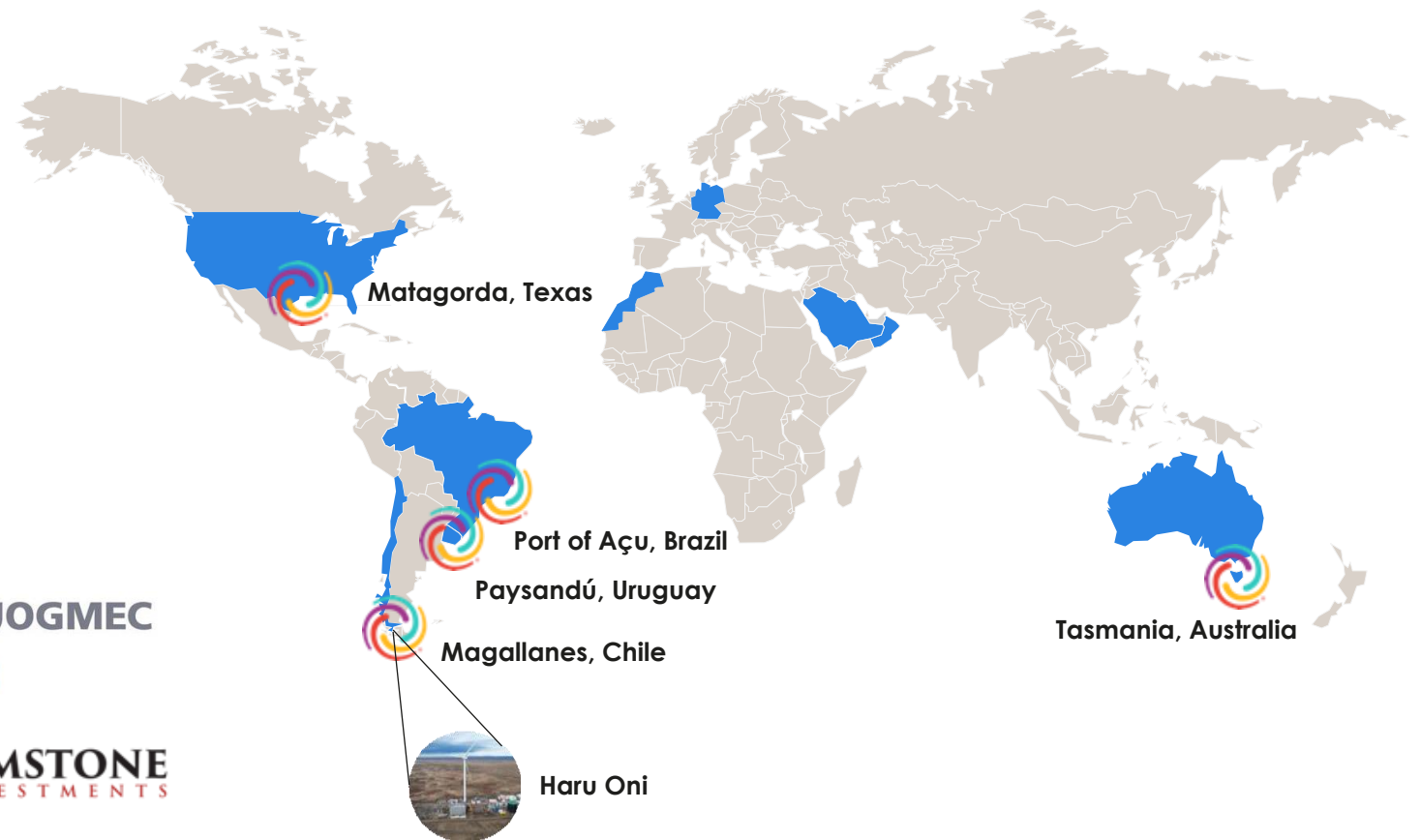


PORSCHE



 HIF project development

 Plant locations



# Haru Oni plant, Chile

## First eFuels produced in December 2022



### Key stats

Wind turbine capacity	3.4 MW
Electrolyzer capacity	1.2 MW
eMethanol production	350 t/a
eGasoline production	130,000 l/a
eLG production	7 t/a

### World Class Team

HIF Global as owner and lead developer

**PORSCHE** **ExxonMobil** **gasco**

Offtaker of the product      MTG technology licensor      Joint R&D in eLPG

**SIEMENS ENERGY** **enel** **ENAP**

Technology provider and integrator      Partner for wind power gen. and H<sub>2</sub> production      Infrastructure service provider



# Haru Oni plant, Chile

## Extending Haru Oni with DAC



## Key stats

- ✓ 2024 installation at HIF Haru Oni
- ✓ Up to 600 tons per year of captured CO<sub>2</sub>
- ✓ On-top output: water

## World class team



**VOLKSWAGEN**

AKTIENGESELLSCHAFT

**MAN Energy Solutions**



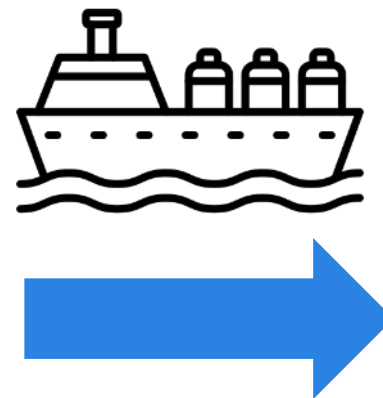
# Methanol-to-Jet in Europe

Unlocking renewable energies with off-site downstream refining



## Production of eMethanol at global renewable energy sweet-spot

- ✓ Reduction of complexity and technical risks in remote area
- ✓ Liquid methanol can be easily transported over long distances
- ✓ Ability to aggregate methanol from different sources for economies of scale



## Downstream refining to drop-in eFuel via methanol-to-X in refinery

- ✓ Existing infrastructure for utility supply and by-product utilization via co-processing
- ✓ Well-trained plant operation workforce
- ✓ Substitute fossil products in existing value chains of core markets
- ✓ In-region production





**More Information at:**  
[www.hifglobal.com](http://www.hifglobal.com)  
[www.haruni.com](http://www.haruni.com)

**Youtube Channel:**  
HIF Global