



SMARTENERGY

# RES to green Hard-to-Abate Sectors

Pedro Guedes de Campos, Director Business Development H2 and e-SAF

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# Smartenergy covers the entire green energy project value chain to deliver green power and H2-based e-fuels

**Extensive capabilities** along the entire project value chain...



...to deliver large-scale **clean energy technology assets**



We **AIM** higher to decarbonize hard-to-abate sectors: **Aviation** with e-SAF, **Industry** with green H2, and **Maritime** shipping with e-methanol & e-Ammonia



The basis for all we do: **Renewable power**





# AIM – Aviation

# We recently have reached key milestones in the development of our SAF projects in PT



## 1 Leça

Electrolyzer 250 MWe

c.80 kt e-SAF p.a.

Active Development

✓ Pre-FEED study with Worley for both sites ongoing



## 2 Galileu (Site I (VFX) + Site II (Aveiras))

Electrolyzer 500(+50)MWe

c.155 kt e-SAF p.a.

Active Development



✓ GtL plant pre-engineering & design package from Topsoe-Sasol obtained

**TOPSOE**



## 3 Mondego (Phases I+II)

Electrolyzer 750(+250)MWe

c.230 kt e-SAF p.a.

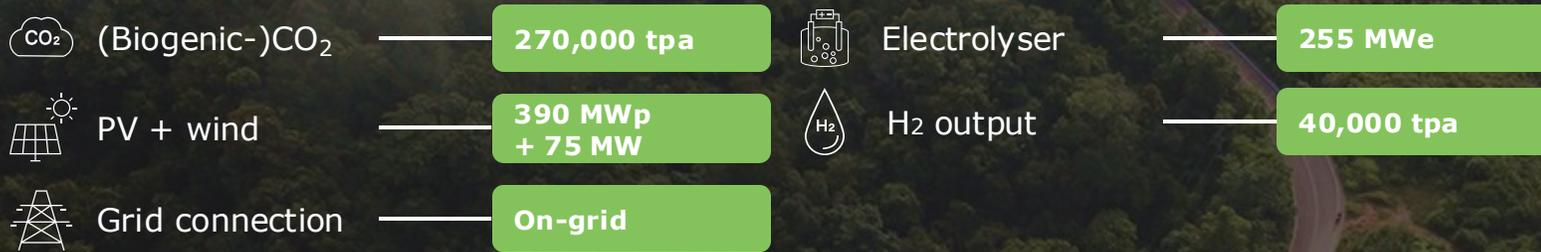
Under Assessment

✓ Learning from other pre-FEED studies to be used for project "Mondego"

Not in focus of this document



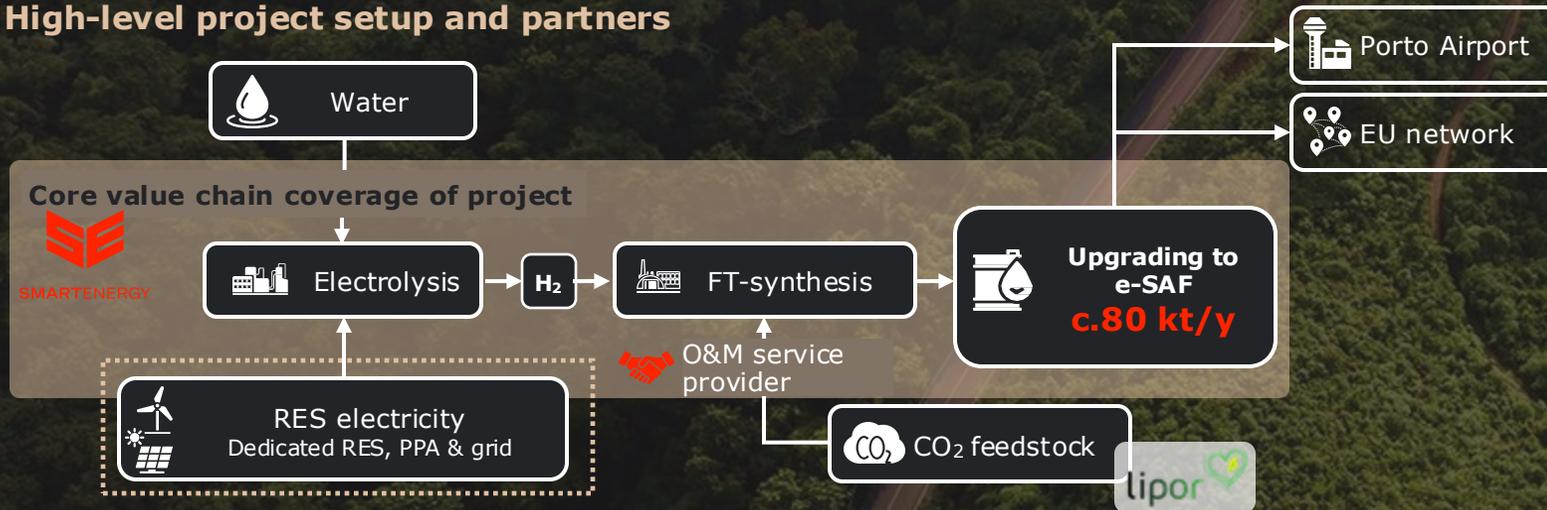
# Leça project targets production of e-SAF; MoU for supply of biogenic CO<sub>2</sub> and with pipeline owner to airport already signed



## Project description

- Repurpose natural gas infrastructure for green H<sub>2</sub>
- SAF production via synthesis of CO<sub>2</sub> from Lipor & Green H<sub>2</sub> from SE
- Supply of SAF to Porto Airport
- SAF exports via Port of Porto

## High-level project setup and partners



MoU signed (12/2023)



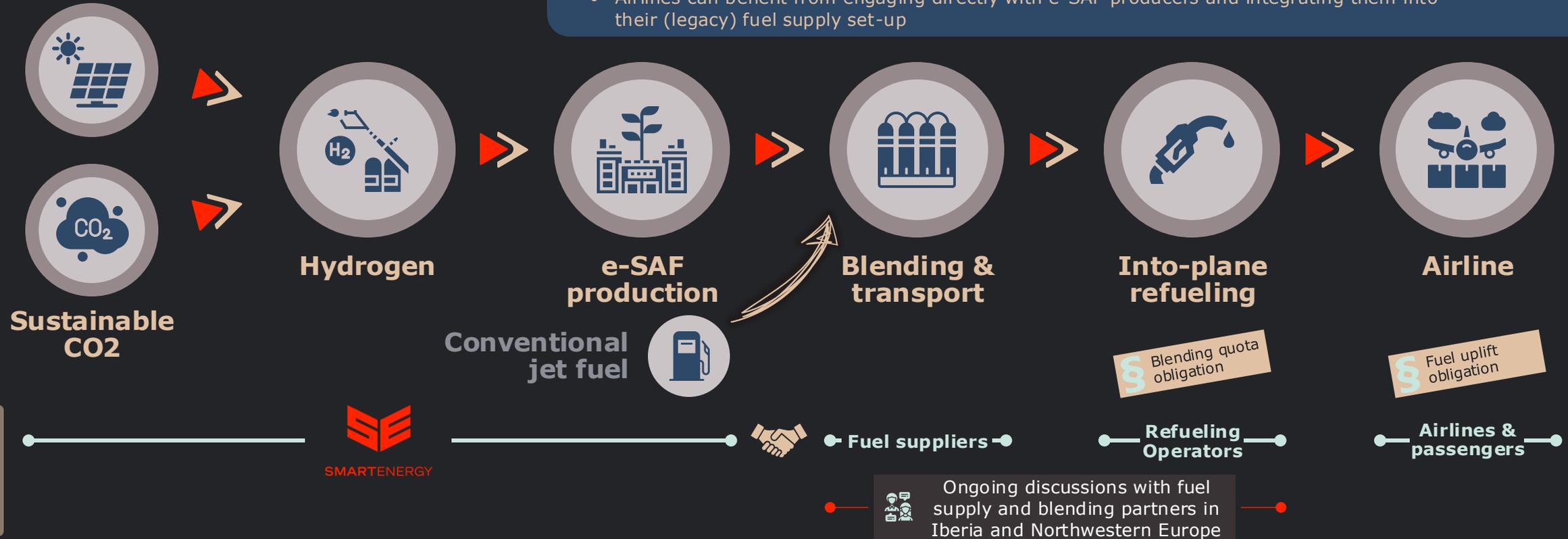
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# To drive e-SAF adoption within the aviation ecosystem, coordinated efforts between airlines, fuel suppliers, and e-SAF producers needed

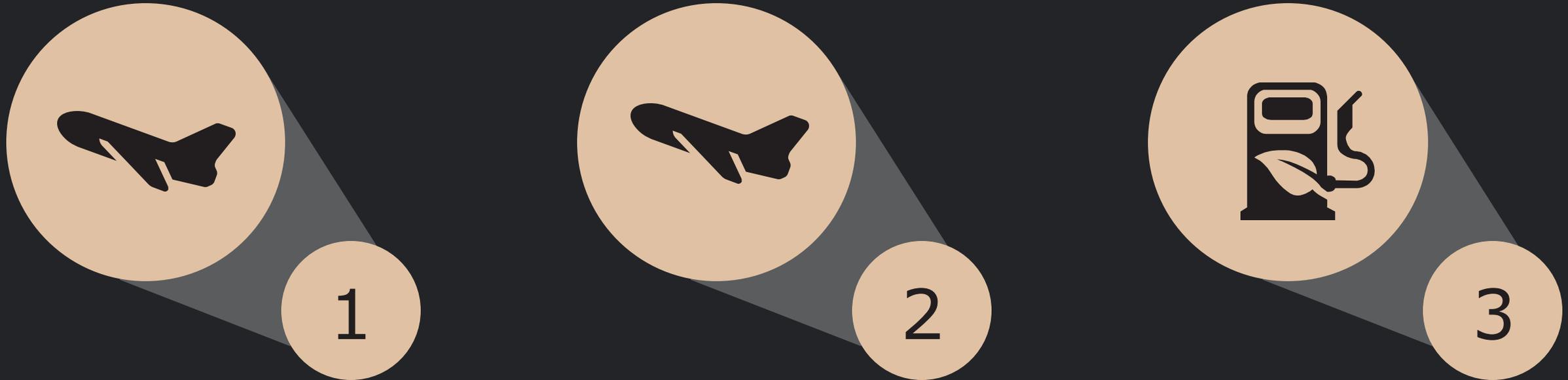
## Key benefits for airlines

- Supply-constrained market – e-SAF with limited availability and high price points
- Fuel suppliers will surcharge additional costs to airlines (pass-through of penalties or high e-SAF sourcing costs)
- Airlines can benefit from engaging directly with e-SAF producers and integrating them into their (legacy) fuel supply set-up

## Renewables



We take a holistic approach to identifying potential off-takers, targeting players from different stages of the value chain



**EU-based aviation companies - commercial**

SMARTENERGY participates in RfP(s) for e-SAF Sourcing to commercial airlines

**EU-based aviation companies (commercial & charters & cargo)**

Ongoing discussions with 10+ EU-based aviation companies

**Intermediaries**

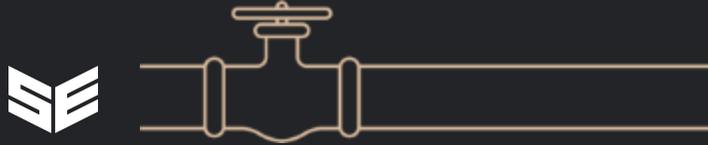
Ongoing discussions with fuel suppliers and commodity traders

A misty forest landscape with a red chevron pointing down.

# AIM – Industry

Project overview

Our three H<sub>2</sub> for industry have a total combined output of 45 k tons H<sub>2</sub> p.a. and are located in Portugal and Spain



1

**Project "Orange.bat"**

Onda-Villareal-Betxí, Spain



**15 k t**

H<sub>2</sub> output p.a.<sup>1)</sup>



**Ceramics industry**

energetic use



2

**Project "Aveiro"**

Aveiro, Portugal



**9.5-15 k t**

H<sub>2</sub> output p.a.<sup>2)</sup>



**Ceramics industry**

energetic use



3

**Project "Mira"**

Sines, Portugal



**15 k t**

H<sub>2</sub> output p.a.<sup>1)</sup>



**Chemical industry**

material & energetic use

Note: Preliminary information; may be subject to change

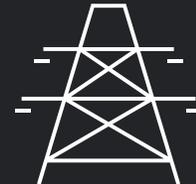
1) Assuming maximum load factor of 90%; 2) Assuming initial load factor of 54%, with a ramp-up to 90%



# Aveiro

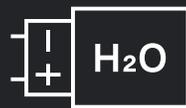


WIND/PV  
**170 MWp**



POWER GRID CONNECTION

**Off (or on)-  
grid**



ELECTROLYSER  
**105 MWe**



ANNUAL H2 OUTPUT

**9'500 – 15'000  
tons**

OFFTAKE MODEL

**HPA industry**

# Aveiro

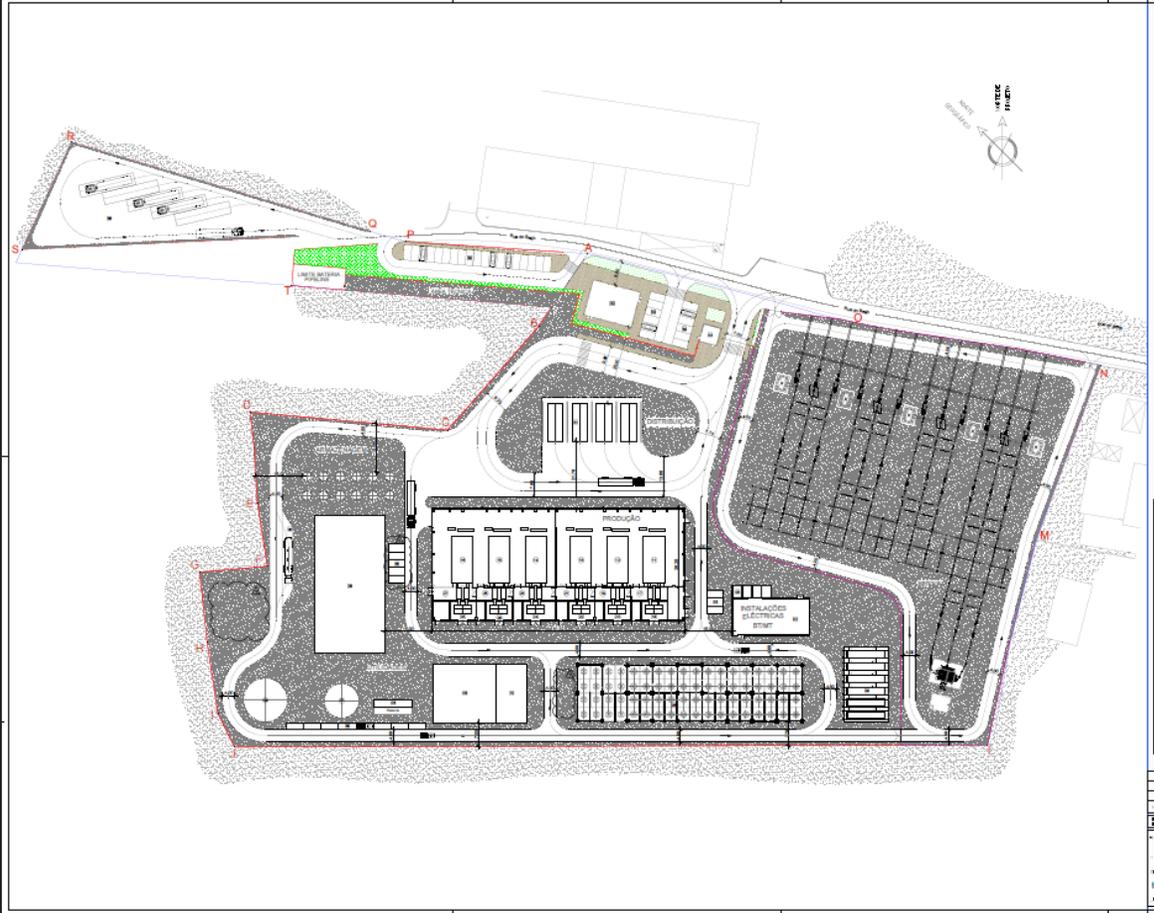


35%\*  
—  
— X

#13 LOIs for a total of 1'800 t green H<sub>2</sub> /year

Project location

# Aveiro

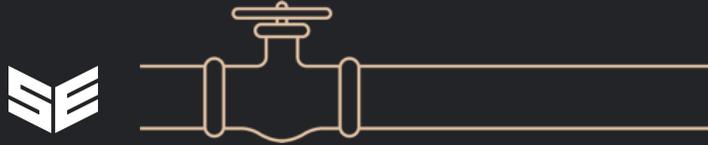




AIM – Maritime

## Project overview

The three lighthouse H<sub>2</sub>-projects for hydrogen-based e-fuels production are located in Portugal, Spain and Italy



1

**Project "Viseu"**



Viseu, Portugal



2

**Project "Sagunto"**



Valencia, Spain



3

**Project "Forlì"**



Rovigo, Italy



**c. 180 k t**

e-methanol p.a.<sup>1)</sup>



**c. 200 k t**

e-methanol p.a.<sup>1)</sup>



**c. 200 k t**

e-methanol p.a.<sup>1)</sup>



**Various north and west Iberian ports**

accessible through favorable railway connection<sup>2)</sup>



**All major south and east Spanish ports**

accessible through favorable railway connection<sup>3)</sup>



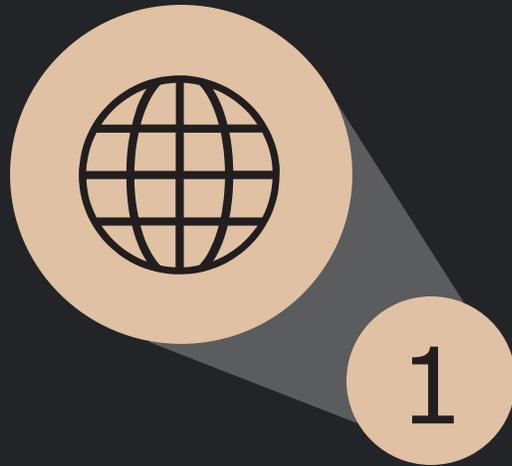
**Po di Levante**

Next to Adriatic LNG Shore Base

Note: Preliminary information; may be subject to change

1) Assuming maximum load factor of 90%, 2) Including ports of Sines, Setúbal, Lisbon, Figueira da Foz, Aveiro, Leça, Viana do Castelo, Vigo, Coruña and via Valladolid to Gijon, Santander, Bilbao and San Sebastian, 3) Including Barcelona, Tarragona, Sagunto, Valencia, Alicante and Cartagena

With our diversified e-fuel product offering, we are in ongoing discussions with potential off-takers from three different segments

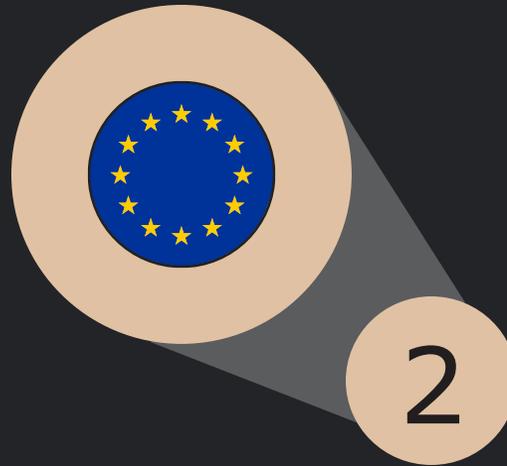


### Intercontinental Shipping

- Large **ocean-going vessels** departing from EU ports with a worldwide destination
- Highly **consolidated market** with few large potential off-takers

**e-ammonia**   **e-methanol**

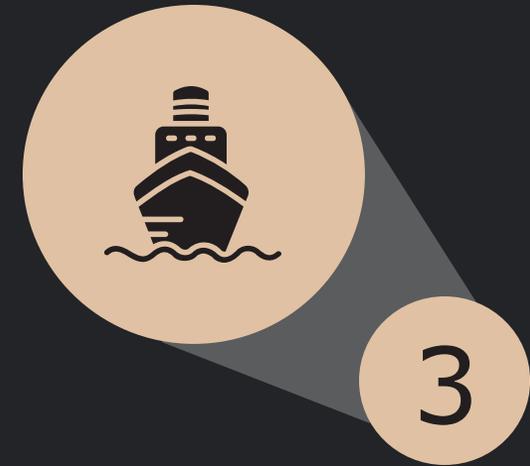
... Likely fuel option   ... Unlikely fuel option



### Intra-EU Short Sea Shipping

- Large ocean-going vessels used for **intra-EU trade by sea**
- Highly **consolidated market** with few large potential off-takers

**e-ammonia**   **e-methanol**



### Inland Waterways Transportation (IWT)

- Small-to medium-sized vessels for **inland waterways transportation** (e.g., Rhine, Danube, etc.)
- **Fragmented market** with large number of players

e-ammonia   **e-methanol**



# Committed.

**SMARTENERGY Group AG**

Sihleggstrasse 17  
8832 Wollerau SZ  
Switzerland

[www.smartenergy.net](http://www.smartenergy.net)