

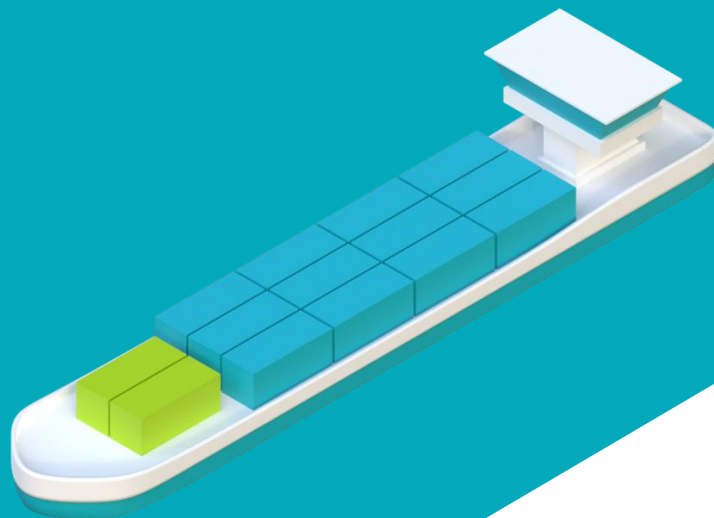




Condor H<sub>2</sub>

# Hydrogen shipping

A RH<sub>2</sub>INE zero-emission shipping project

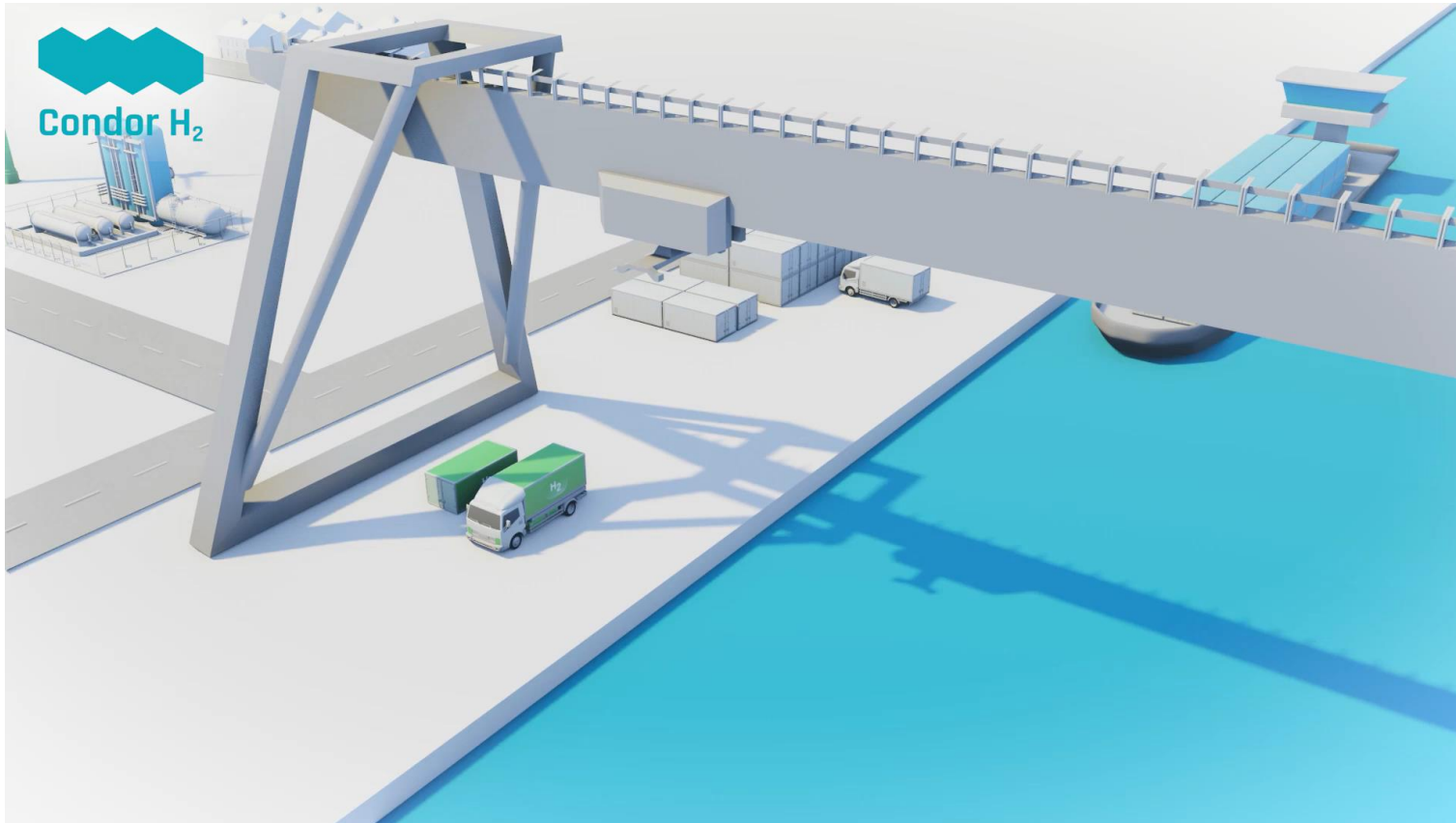


# Rhine Hydrogen Integration Network of Excellence

## RH<sub>2</sub>INE -Participating regions and countries



# The H<sub>2</sub> solution for inland/ near-shore shipping:

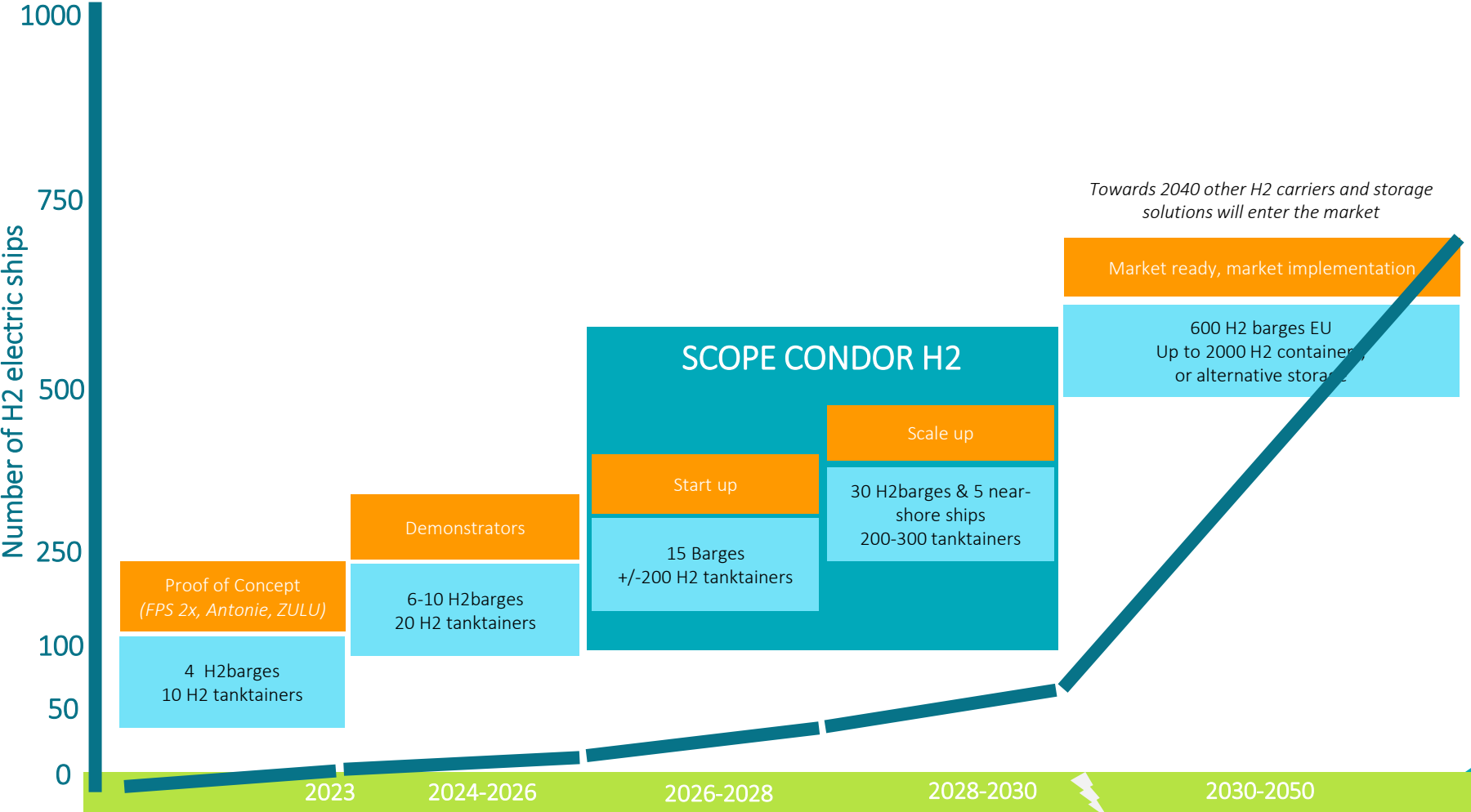


# Selection of compressed- H2- FC IWT projects- partly funded

Project name	Vessel name	Vessel owner	Sailing Location	(Target) sailing date H2	Technology	Notes
1	SWIM	H2-Watertaxi	Watertaxi	Netherlands	2024	Hybrid, small FC
2		Elektra	Imperial logistics	Germany	2024	Hybrid, small FC
3	ZEM ports, and other	H2 Barge 1 (Maas)	Future Proof Shipping	Netherlands	2024	Hybrid, small FC
4		Ab Initio	STC			Hybrid, small FC
5	WEVA	MS Antonie	Lenten BV			155m dry cargo, new
6	FCH- JU Flagships	FPS Waal	Future Proof Shipping			110m dry cargo, retrofit
7	FCH- JU Flagships	Zulu06	Compan			Hybrid, Fuel Cell Tanker, New
8	RH2IWER	FPS Rijn				C-H2, Fuel Cell 135m dry cargo, retrofit
9	RH2IWER	MTS Volendam				C-H2, Fuel Cell 135m tanker, retrofit
10	RH2IWER			2024		C-H2, Fuel Cell 110m dry cargo, new
11	RH2IWER			2024		C-H2, Fuel Cell 135m tanker, new
12	RH2IWER		Netherlands	2025		C-H2, Fuel Cell 86m dry cargo, new
13	RH2IWER		Netherlands	2026		C-H2, Fuel Cell 110m dry cargo, retrofit
14	MAGPIE		Netherlands	2024		Battery- C-H2, FC 110m dry cargo, retrofit
15	German subsidy		Germany- Netherlands	??		Hybrid, C-H2, Fuel Cell, generators ??
16	German subsidy		RHENUS	Germany	2024	Hybrid, C-H2, Fuel Cell, generators ??

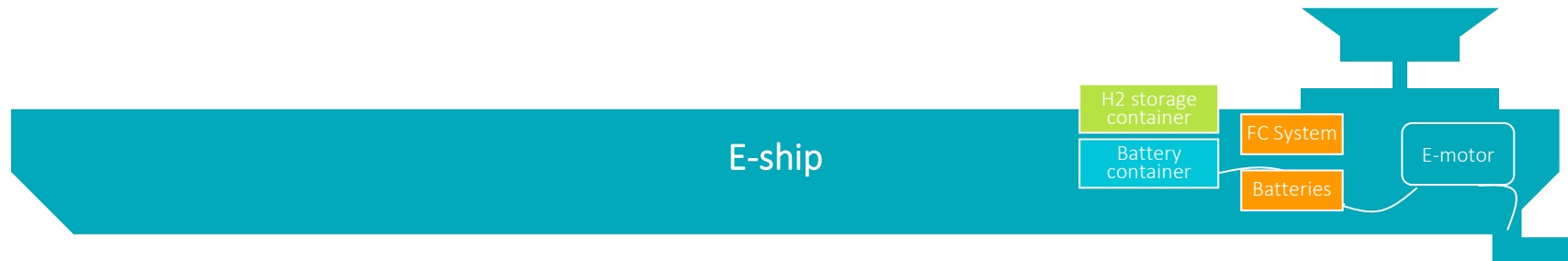
Message: plenty of IWT demonstrators on its way!  
 How to make it scalable to rest of IWT + Shortsea?

# Scale-up and phasing- H2-electric ships



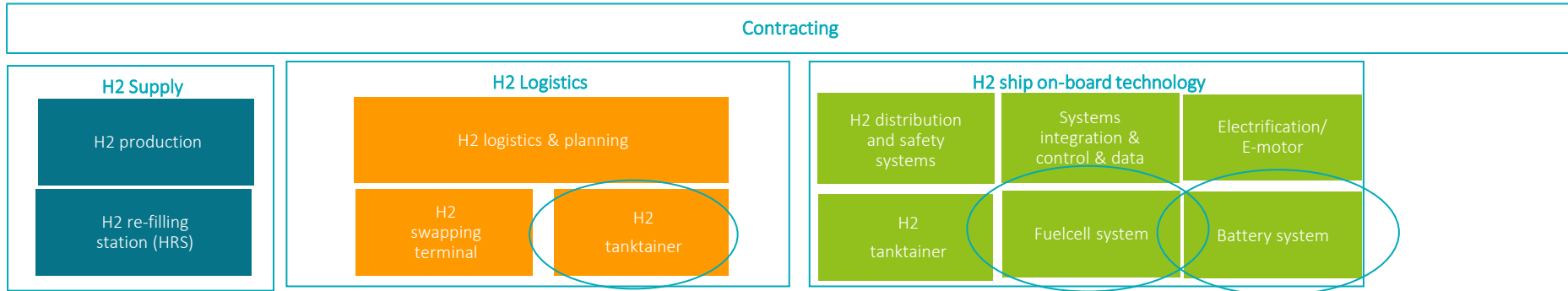
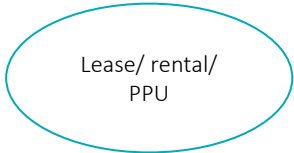
# Goal: **Speed up** emission-free shipping with 5-10 years, by:

- 1.**  
**Operational, technical and economical** feasibility by 2033
- 2.**  
**Modular, standardised & scalable** solutions, electrification as “no-regret”
- 3.**  
**Reduce** necessary investments for shipowners with **pay-per-use**
- 4.**  
Implement **50 ships** by 2030, inland and short-sea
- 5.**  
Facilitate **open, flexible** hydrogen supply market for shipping



# The concept: Towards an EAAS-business model for H2 shipping

Elements of possible service-model:



- H2 suppliers
- Create a pool of standardized tanktainers
- Offer tanktainers PPU to shipowners, incl services
- Several H2C suppliers/ EOMs
- Open for & accepted by key H2 suppliers
- Offer FC and battery systems PPU to shipowners
- Several FC system and battery system suppliers/ EOMs
- Several integrators/ installation companies
- Several yards



# Current Condor H2 consortium partners

Group	Party
<b>Bank/ investor</b>	Rabobank
	KBC
<b>Shipping</b>	Naval shipping
	NPRC
	DFDS
	Future Proof Shipping
	HTS Maritiem
	Theo Pouw B.V.
	Verenigde Tankrederij
	Samskip
<b>H2 suppliers</b>	Air Liquide
	Air Products
	Linde
	Inovyn
	Shell
	Engie
	BP
	EOLY/Virya
<b>E-ship design/ build</b>	Concordia Damen
	Koedood
	Marin
<b>Fuel Cells</b>	Ballard
	Nedstack
	Zepp Solutions

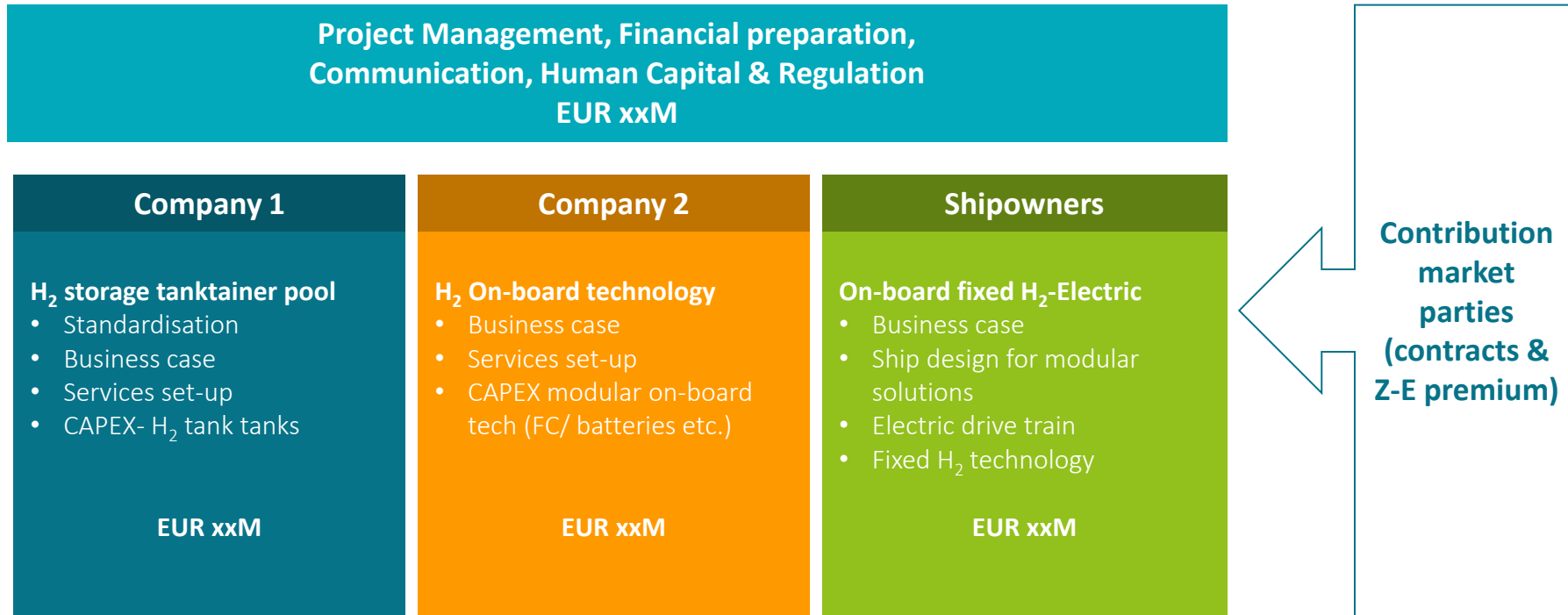
Group	Party
<b>H2 tanktainers/ logistics</b>	Blue H Engineering
	NPROXX
	H2storage BV
	Umoe
	VITRITE Middelburg
<b>H2 logistics</b>	Rotterdam Shortsea Terminal (RST)
	Schenk Tanktransport
	FinCo
<b>Ports</b>	Port of Antwerpen Brugge (Port) Nijmegen
	Port of Rotterdam
	Port of Amsterdam
	Port of Duisburg
	Northseaports
<b>Other stakeholders</b>	De Vlaamse Waterweg
	Provincie Zuid Holland
	Provincie Noord Holland
	Waterstofnet
	EICB
	STC
	Maritime Academy Harlingen

# Project set-up

<b>Supportive</b>	<b>WP1: Project building, management &amp; communication</b> <ul style="list-style-type: none"> <li>• Business plan, business models for scaling</li> <li>• Project funding strategy &amp; proposal writing</li> <li>• Legal structures/ entities</li> <li>• Coordination stakeholders, Communication &amp; Dissemination</li> </ul>			<b>WP7: Z-E Insetting &amp; Market development</b>
	<b>WP2: Finance</b> <ul style="list-style-type: none"> <li>• Economical impact, ToC &amp; SCBA (MKBA), incl scenario's</li> <li>• Funding plan, state aid</li> <li>• Business cases of companies &amp; ships</li> <li>• Investments, financing</li> </ul>		<b>Inland Vessels:</b> Cargo/ passenger/ push boats (New / Retrofit)	
	<b>WP3: Human capital</b> <ul style="list-style-type: none"> <li>• Training &amp; Education</li> </ul>			
<b>WP4: H2 supply &amp; logistics</b> <ul style="list-style-type: none"> <li>• H2 supply network</li> <li>• Storage standardisation</li> <li>• Creation of H2 storage pool</li> <li>• H<sub>2</sub> logistics, incl. data &amp; digitalisation</li> <li>• Contracting/ maintenance/ after sales services</li> </ul>	<b>WP5: On-board H2 technology</b> <ul style="list-style-type: none"> <li>• Fuel cell systems</li> <li>• Battery systems</li> <li>• H<sub>2</sub> distribution system</li> <li>• System integration &amp; control</li> <li>• Data &amp; digitalisation/ maintenance/ after sales services</li> </ul>	<b>WP6: E-ship design</b> <ul style="list-style-type: none"> <li>• Electrification</li> <li>• Modular design, retrofit blueprints</li> <li>• Preparation of vessels for H<sub>2</sub> technology</li> </ul>	<b>Shortsea Vessels:</b> Cargo/ passenger/ Ro-Ro (New / Retrofit)	<b>Cargo owners</b>
<b>Regulation &amp; Standardisation</b>			<b>Near-shore Vessels:</b> (New / Retrofit)	
<b>Regulation &amp; Standardisation</b>			<b>Other Vessels:</b> (New / Retrofit)	

# Concept set-up & budgeting full scope

Budget blocks for investments and subsidies



# Condor H2 consortium partner levels

ROLE*	Contribution	Benefits/role	Entry Fee
<b>PRIMARY-(INVESTOR)</b>	Pro-active contributor: knowledge/ expertise and funding	Party considered as possible <b>investor</b> . Informed 6 weekly.	<b>Min.€ 5K**</b>
<b>PRIMARY (STAKEHOLDER)</b>		Direct recipient of funding, or large stakeholder. Informed 6 weekly.	<b>Min.€ 5K**</b>
<b>SECONDARY (STAKEHOLDER)</b>	Re-active contributor: Knowledge/ expertise for pre-defined scope (one WP)	Party considered as part of consortium, (e.g. suppliers, customers, other stakeholders). Informed quarterly.	<b>Min. €2,5K</b>
<b>SUPPORTER</b> (not mentioned as consortium partner)	Sign LoS for subsidy application	Other stakeholders, will be informed ad-hoc.	<b>€ -</b>

\* In 2023 an LOI must be signed with Port of Rotterdam to become a consortium partner

\*\*Primary partners will be asked for an additional contribution for a large subsidy application during 2<sup>nd</sup> half 2023.



**Condor H<sub>2</sub>**

**Will you join us to accelerate zero-emission shipping?**

**Contact**

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