FLASC

Renewable Energy Storage

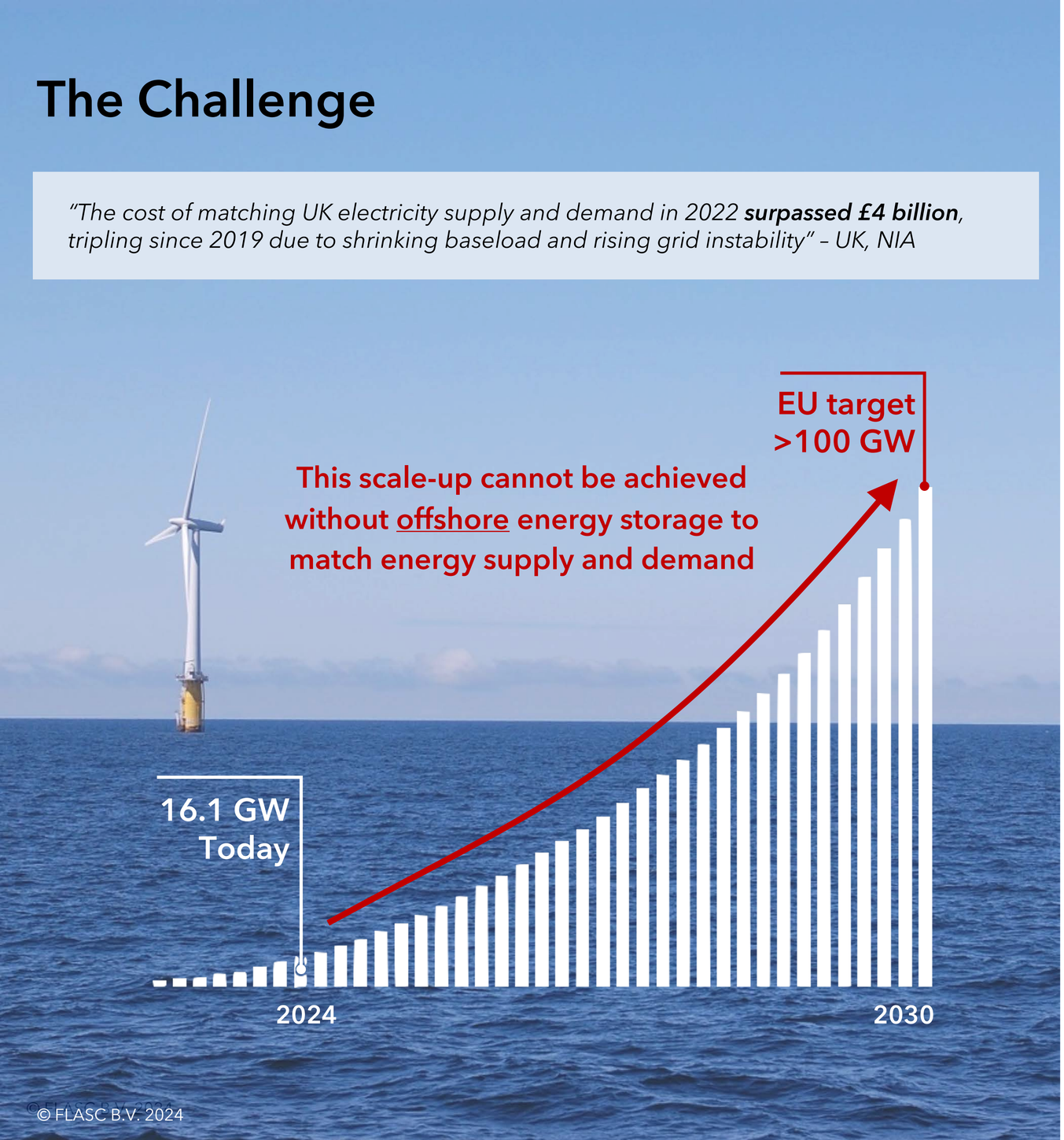
www.offshoreenergystorage.com

FLASC B.V., Paardenmarkt 1, 2611 PA Delft, The Netherlands

Non-Confidential
Investor Deck
March 2024

The Challenge

"The cost of matching UK electricity supply and demand in 2022 ***surpassed £4 billion****, tripling since 2019 due to shrinking baseload and rising grid instability" – UK, NIA*



Supply-Demand Mismatch

- Offshore wind generation is intermittent and can only be used **when** there is immediate energy demand.
- When the onshore grid is constrained, offshore power cannot be delivered **where** it is needed and ends up being wasted.

Client-Specific Pain Points

Offshore Wind Developers

End Client

- Exposure to wind intermittency, demand fluctuations, grid congestion and market volatility.
- Decreasing offshore wind profitability and bottle-necks around future wind farm deployments.
- Current offshore energy storage solutions are not scalable for offshore wind applications:
  1. High CAPEX
  2. Very Large & Complex Infrastructure
  3. High Maintenance Cost

Our Solution: FLASC HPES

FLASC HPES (Hydro-Pneumatic Energy Storage) is the first utility-scale energy storage solution tailored for co-location in offshore wind farms

It enables wind developers to store energy **where** it is produced and deliver it **when** needed, improving the economics of their wind farms.

- **Patented Innovations to address Client Pains:**

Pneumatic Pre-Charging:

- **100x higher energy density** in shallow water applications resulting in a Levelised Cost of Storage **competitive with onshore systems**

The Ocean as a Natural Heatsink:

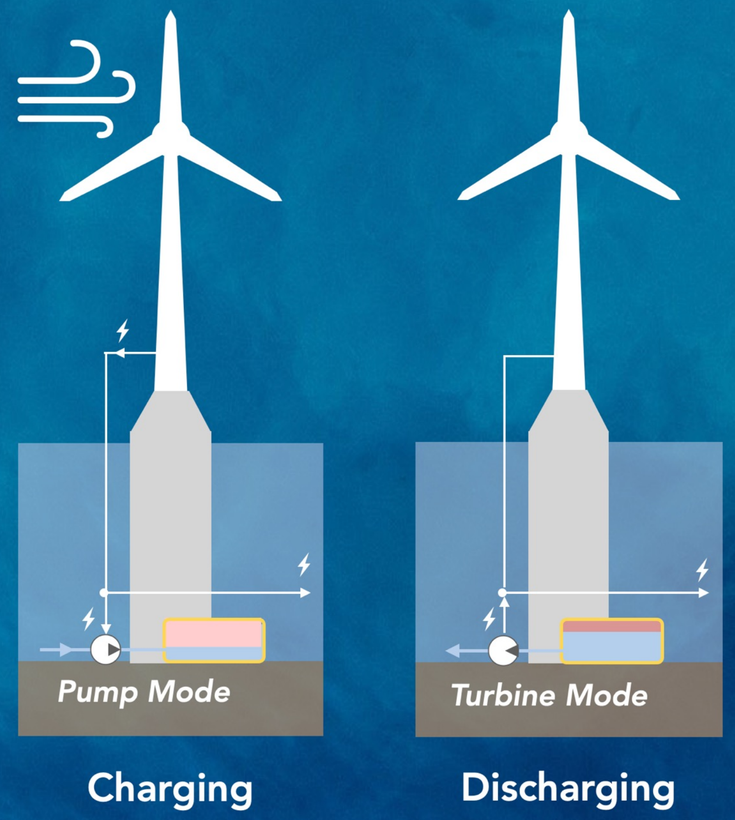
- **70-75% Round-Trip Efficiency** without complex thermal storage or heat exchangers, which adds **10-15% more value** per project

Main Features:

- Scalability: **>100 MWh**
- Storage Duration: **4-12 hours**
- Long Lifetime: **+30 years**
- Roundtrip Efficiency: **70-75%**
- No flammability risks or chemical hazards
- Robust global supply-chain
- Circular: built primarily out of steel and can repurpose existing offshore assets

"FLASC's solution is an innovative technology with significant potential, offering a competitive and more sustainable alternative to Li-ion battery farms."

– Thomas Sunde, VP Strategy & Technology, Subsea7



▲ FLASC HPES converts electricity into hydraulic power during charging and back to electricity during discharging

Scalability & Versatility

- Suitable for **bottom-fixed and floating applications**

FLASC HPES =

Energy Conversion Unit (ECU)
Modular electrical interface housing pumps, turbines and power conversion equipment.

+

Pressure Containment System (PCS)
Storage volume housing the compressed air.

In Progress: ECU for Floating Wind Demo
Part of EU-funded project (H2020 BG-05-2019)[1]

Option to re-purposing **existing** offshore assets as a PCS promotes circularity and sustainability

FLASC can be deployed in a range of configurations:
(1) bottom-fixed wind; (2) offshore PV; (3) floater-integrated;
(4) stand-alone centralized unit; (5) in a repurposed existing offshore pipeline.

[1] Funding secured through University of Malta as part of H2020 project MUSICA

Proven Technology

TRL 6

▲ **First Prototype (2018)**
Grand Harbour, Malta

+400
Charging Cycles

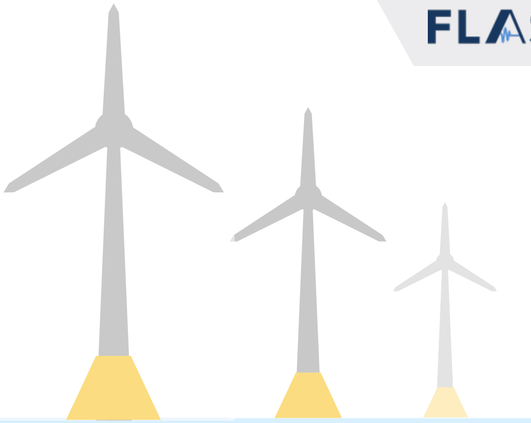
+15 Months
Continuous Operation

>96%
Thermal Efficiency

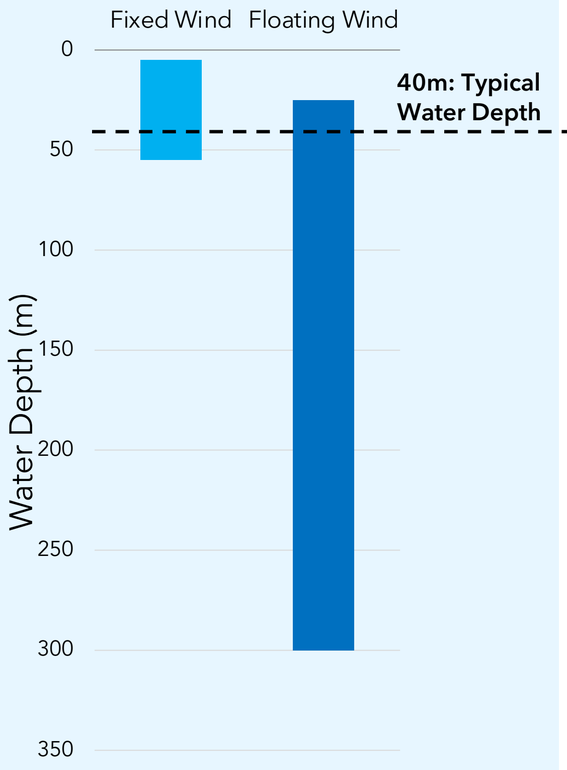
+98%
System Availability

Competitive Landscape: Offshore Energy Storage

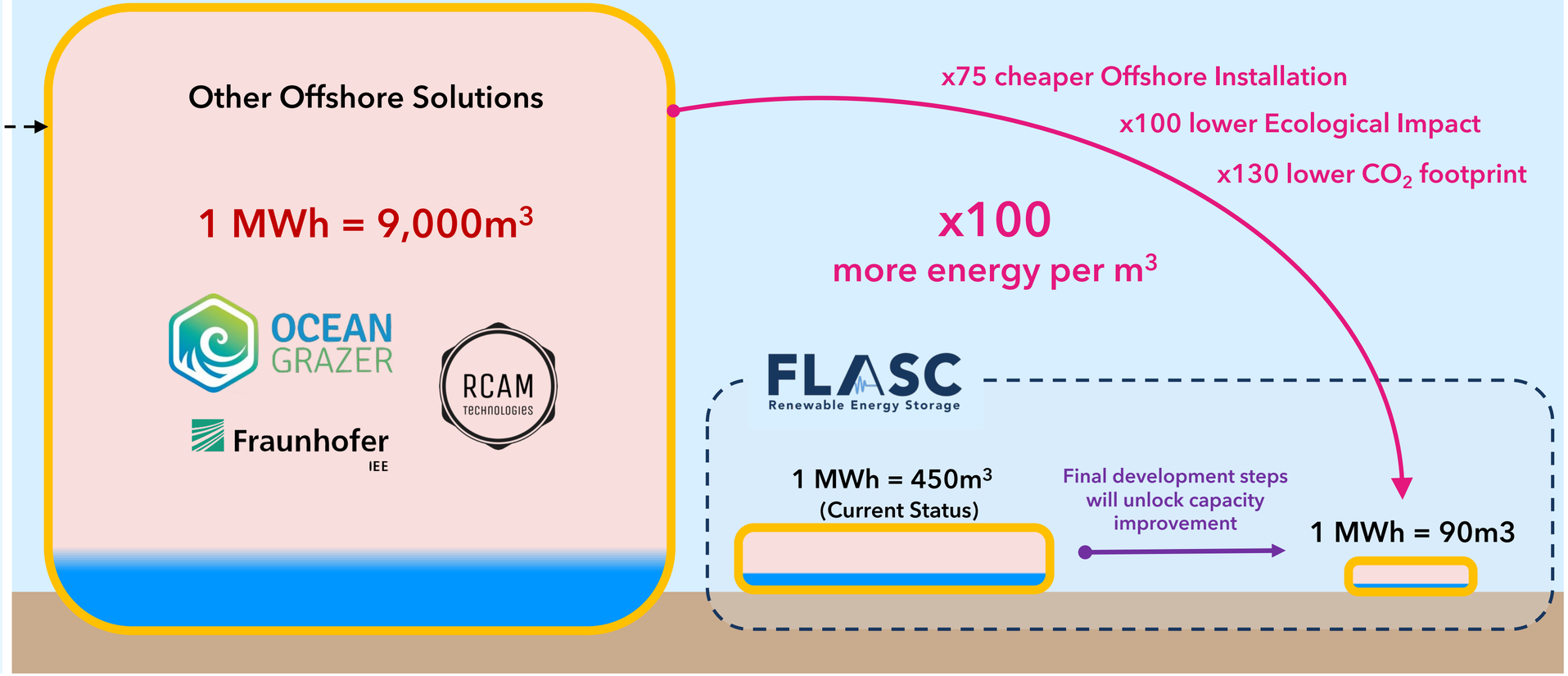
- Market research shows that **upcoming offshore wind projects will be in shallower waters (<300m)** [1]
- FLASC is the **first solution** suitable for this water depth



Water depth ranges for operational and planned offshore wind projects [1]



Volume Requirements for Typical Fixed-Wind Installation Depth (40m)

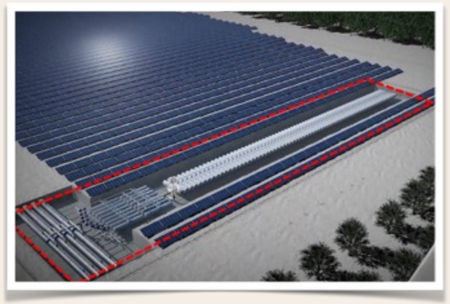


[1] Offshore Wind Market Report 2021 Edition: Global offshore wind energy projects by depth, country, and project size (US Dept of Energy)

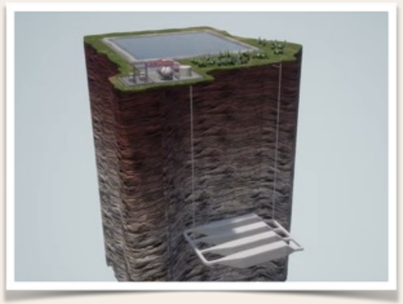
Competitive Landscape: existing technologies do not solve the problem

Onshore Long-Duration Energy Storage

- Large-scale infrastructure with significant topographical constraints
- **Does not adequately address spatial mismatch for offshore wind**



▲ Land-based HPES (Augwind)



▲ CAES (Hydrostor)

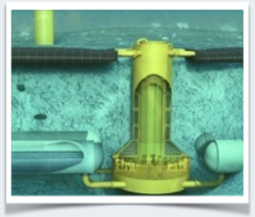
▲ Gravity Storage (Energy Vault)

▲ LAES (Highview Power)

Offshore Energy Storage

- Solutions using hydrostatic pressure require deep water
- **Too big and too expensive for co-location with offshore wind**

▲ StEnSea (Fraunhofer)

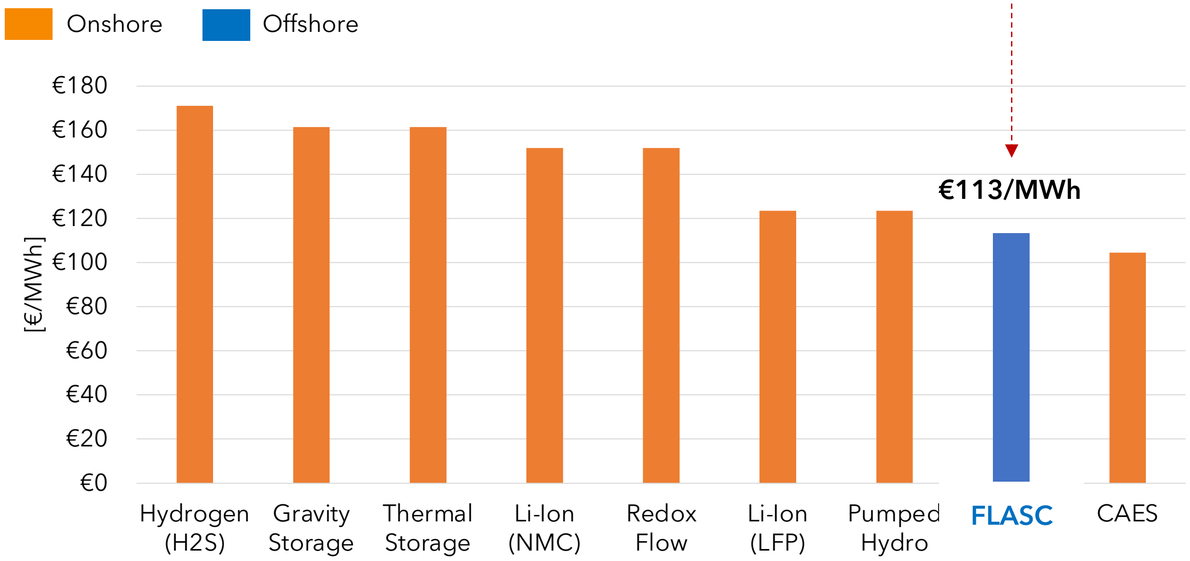


▲ Ocean Grazer

FLASC
Renewable Energy Storage

- FLASC is specifically positioned to address temporal and spatial mismatch in offshore wind applications
- Energy density up to x100 greater than existing offshore solutions
- **Levelised cost that is competitive with the cheapest land-based storage**

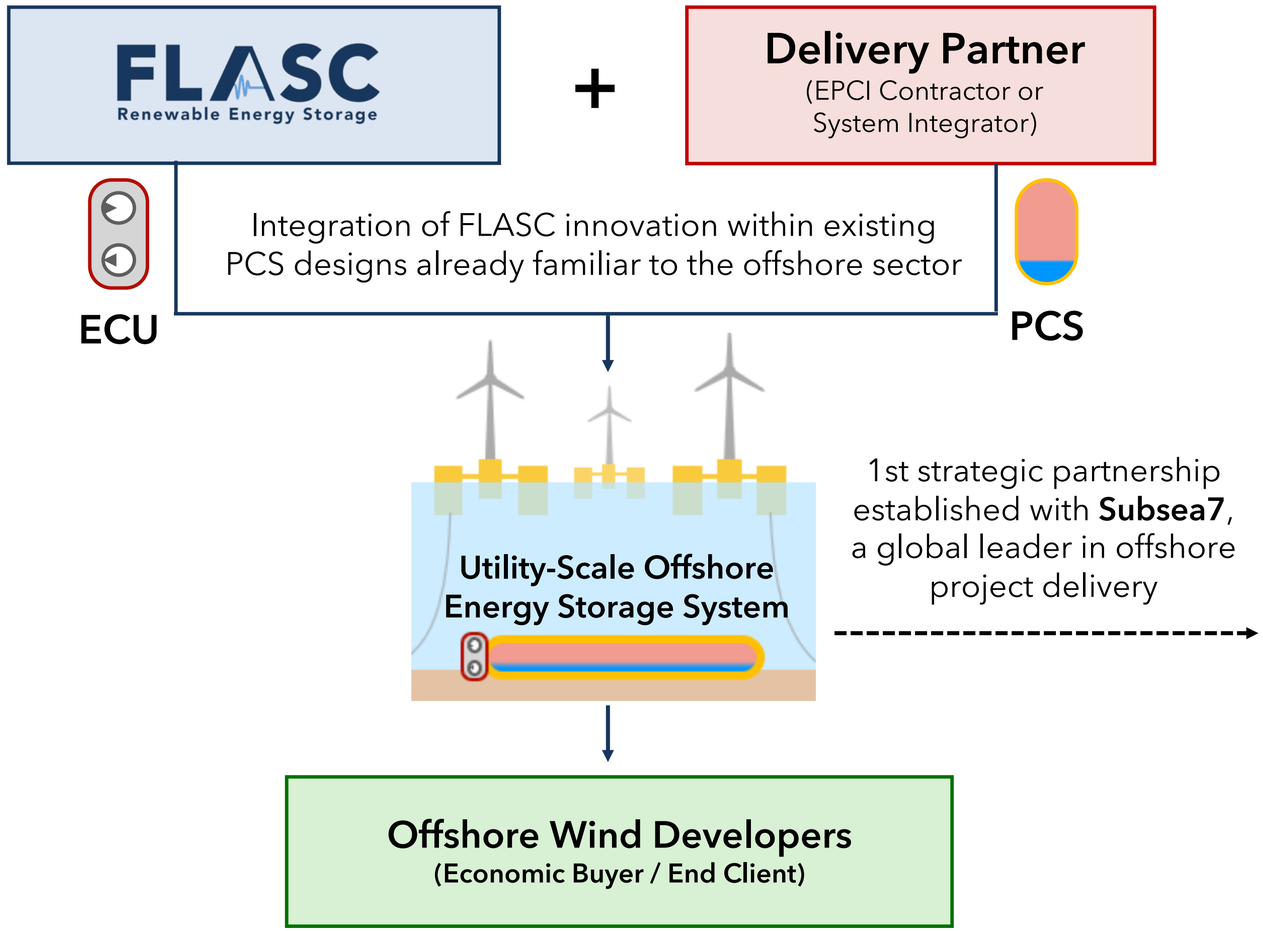
2030 Levelised Cost of Storage (LCOS)[1]



[1] 2022 Grid Energy Storage Technology Cost and Performance Assessment (US Dept of Energy) (+100MW / 10-hr Duration)

Business Model (B2B)

- Scalable revenues from selling modular **ECU equipment** into joint-projects.
- Scalable production **with low CAPEX intensity** that can be ramped up as needed.
- Working with established delivery partner **eliminates offshore execution risk**.



PowerBundle

- FLASC HPES embodiment jointly-developed with Subsea7
- Leverages proven subsea bundle design in operation for +40 years
- Utilises existing Susbea7 fabrication and installation capabilities

PCS: Pressure Vessels integrated within Bundle

ECU: Pump and Turbine integrated within Towhead

FLASC enables Developers to improve the Business Case of Offshore Wind Farms

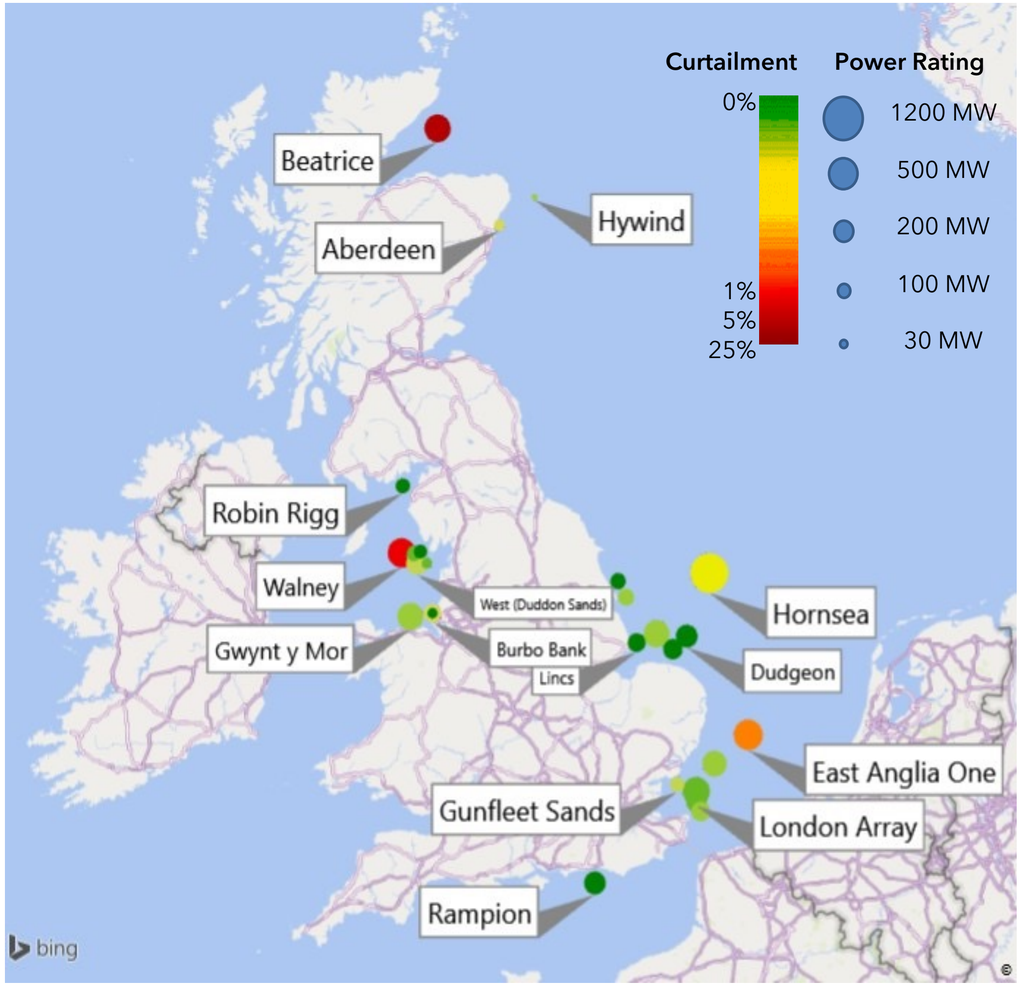
- Evaluation of Offshore Wind Business Cases with Siemens Energy
- Case study on 26 UK offshore wind farms presented at *WindEurope* 2024 [1]

- Co-locating FLASC with UK offshore wind farms corresponds to an **IRR of 18%**
- Based on 2021-22 markets, FLASC would add **€300m/yr** to UK wind revenues
- Value add increases significantly to 2030 as wind penetration increases.
- Co-located energy storage being incentivised in recent subsidy schemes.

Adds at least **10% more value** to existing UK offshore wind farms

Enables participation in **balancing markets** by hedging against volatility

Offshore wind can become an **active provider** of grid flexibility



[1] Singuran et al. (FLASC / Siemens Energy) "Clean energy when the wind is not blowing: evaluating business cases for co-located offshore energy storage across 26 UK offshore wind farms". *WindEurope 2024*

Market Opportunity

- Enabling offshore wind deployment and stabilising intermittent power using co-located **FLASC offshore energy storage**

TAM: Global Co-Located Offshore Storage

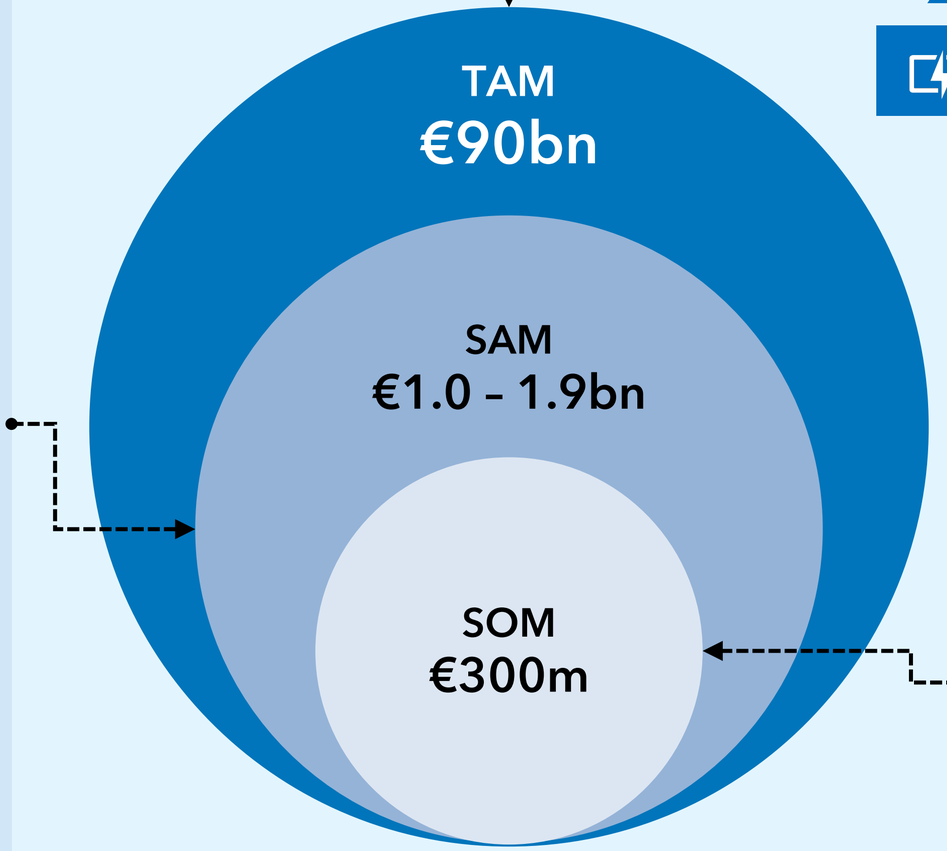
250 GW Global Offshore Wind by 2030[1]

capacity based on energy storage sizing/duration needs

100GWh / €90bn
co-located offshore storage by 2030

~2% of Global Long Duration Energy Storage (LDES)

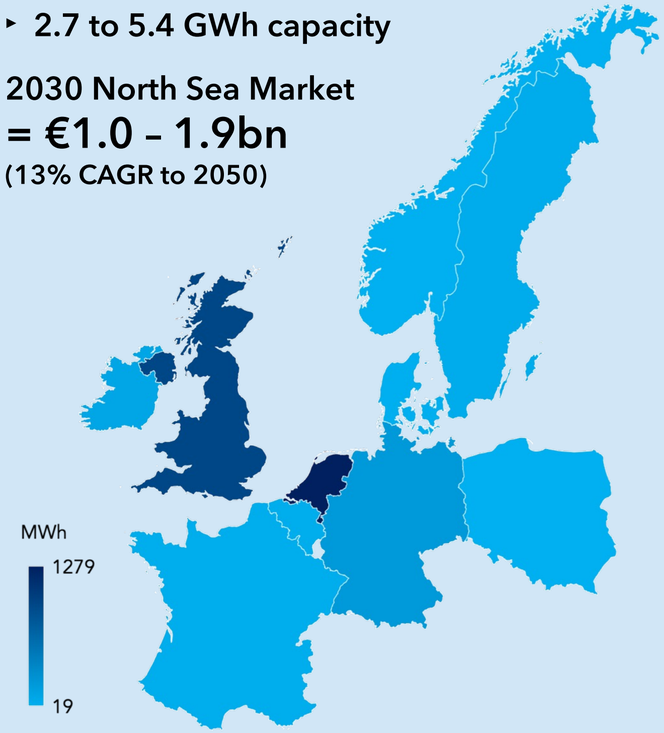
4-6TWh / €3.6tn Global LDES by 2030[2]



SAM: North Sea Region (2030)

- Bottom-up market estimate based on real project data[3] from the North Sea (shallow water)
- Two adoption scenarios computed:
- **2.7 to 5.4 GWh capacity**

2030 North Sea Market
= €1.0 – 1.9bn
(13% CAGR to 2050)



SOM: 2030 Annual Revenue

- Bottom-up estimate based on FLASC cash-flow projections built on ECU sales business model
- Accounts for unit economics on early projects and roll-out across the entry market
- **1.1 GWh project pipeline**

= €300m/yr
2030 revenue for FLASC

FLASC Renewable Energy Storage

[1] IHS Markit Data: Global Offshore Wind Outlook to 2050 by Region [2] Solar and LDES: Critical Partners to Ensure 24/7 Reliable Renewable Energy, LDES Council, Dec 2023 [3] Offshore wind market data: Subsea 7(C365)

Traction

7
LoIs

- Wind developers with confirmed interest to deploy FLASC systems in their projects.
- Representing an installed capacity of **+1GWh** by 2030

3
MoUs

- FLASC included in 2 North Sea offshore wind farm tenders since 2020

Ørsted sse Renewables icepco

x3

- World-leading delivery partners and suppliers ready to support our growth

subsea 7 SIEMENS energy VHT VAN HALTEREN TECHNOLOGIES

+€1m

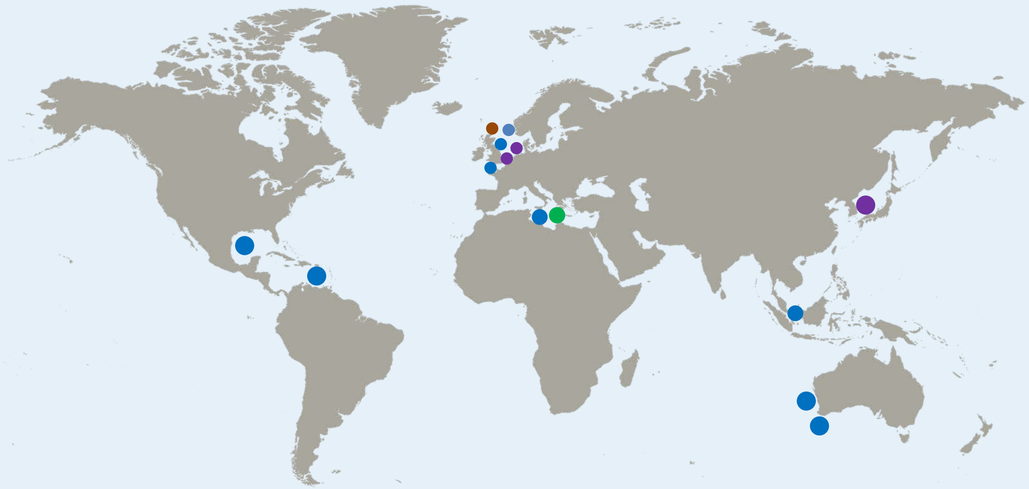
- Already generated from early revenues

+60

- NDAs established across our value chain including early commercial leads

5
Regions

- Technology versatility and established delivery partners enable a global reach



Demo Project Deployment
MoUs / Project Bids
FEED Studies
Feasibility Studies

The Team

- First movers in offshore energy storage since 2015
- Supported by a team of passionate engineers and experienced market specialists (9FTEs)

Daniel Buhagiar
Co-Founder / CEO

- Business development and commercialisation
- Ph.D. in offshore energy storage
- Experienced in offshore projects

Tonio Sant
Co-Founder / CTO

- Research and technical development
- Award-winning Ph.D. in wind turbine aerodynamics from TU Delft
- +120 peer-reviewed publications

Robert Farrugia
Co-Founder / R&D Specialist

- +25 years of experience in wind measurement and data analysis
- Leading research on offshore energy storage for green hydrogen production

Anton Bartolo
Executive Director / IP Specialist

- IP and technology transfer expert
- Strategy development
- Partnership agreements and stakeholder relations

L-Università ta' Malta

University of Malta Spin-Off

FLASC actively collaborates with the University and holds an exclusive license to all HPES-related intellectual property and know-how.

Buccaneer Delft
accelerating energy & offshore

Part of the Buccaneer Delft Accelerator (The Netherlands)

Founded by Joop Roodenburg in the heart of the offshore energy sector with an extensive partner network.

Supported by:

Blue Pelican Capital (BPC) a European sustainable Climate Innovation advisory and investment company

Mevin Kistnassamy

Jerome de Richemont

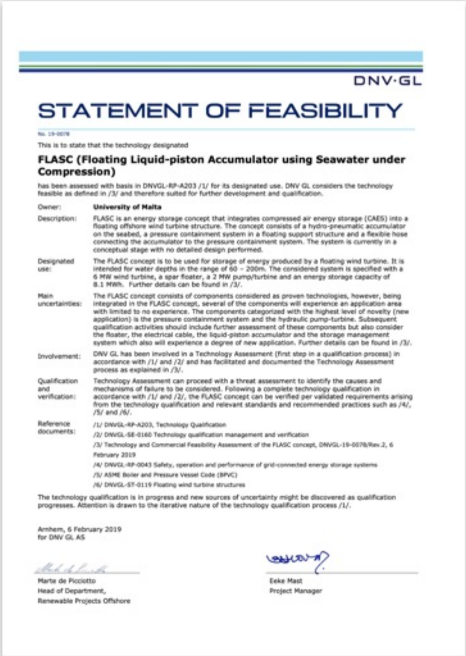
- Operational and investment expertise in the offshore energy sector.
- Supporting FLASC on developing strategic partnerships, investor engagement and financial aspects.

FLASC Advisors:

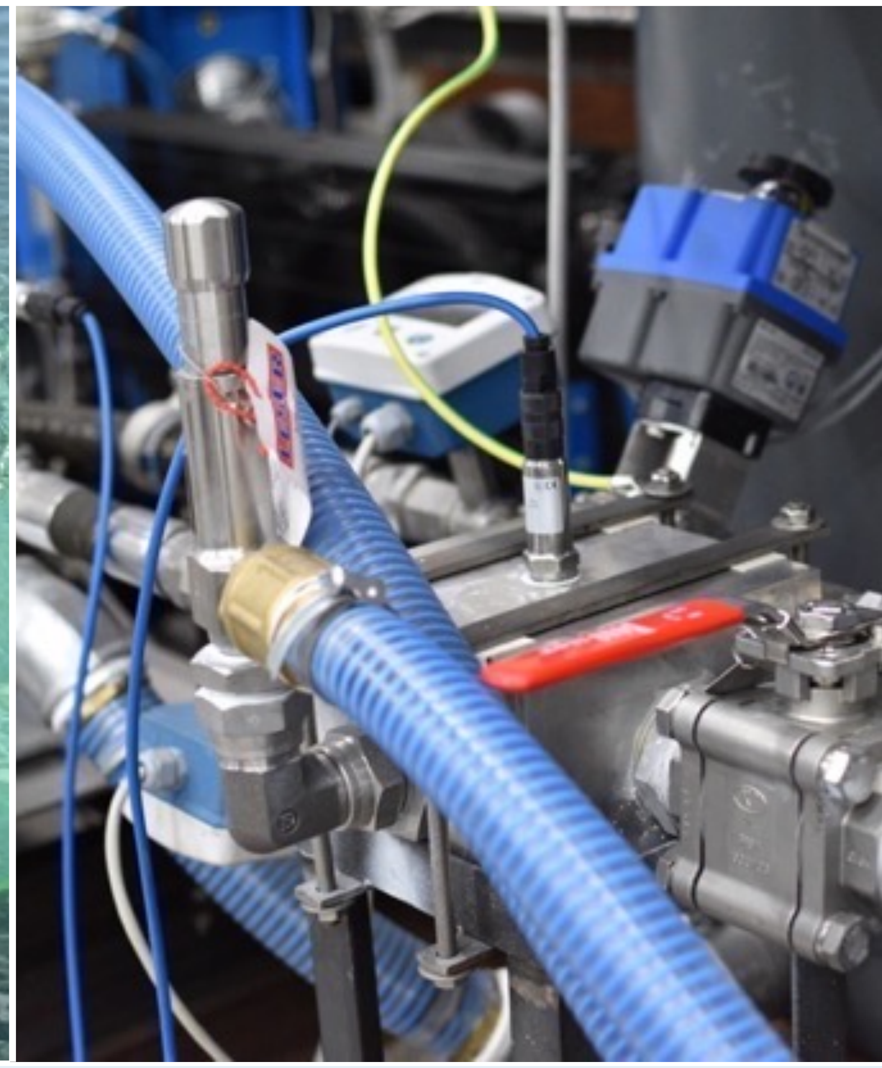
- **Martin Van Onna**
  CEO at Strohm
  Founding member of a leading manufacturer of composite pipes for renewable energy and oil & gas applications
- **Kees Willemse, Ph.D.**
  Independent Advisor
  Ex-TU Delft Professor of Offshore Engineering with extensive energy and maritime sector experience
- **Paul Chang**
  Technical Specialist (Subsea Engineering)
  Specialist engineer with decades of experience in subsea engineering, currently lead controls engineer at Equinor
- **Jessica Settino, Ph.D.**
  Technical Specialist (Green Hydrogen)
  Expert researcher on modelling of energy systems, including green hydrogen production from wind.

Development Milestones

Year	Milestone	Details
2017	Proof-of-Concept [TRL5]	
2018	International Patents Granted	▲ **Patents Granted**: Europe, US, China and Japan
2019	DNV Statement of Feasibility	
2020-23	Floating Wind Demo [TRL7] H2020 BG-05-2019	‣ Grid-connected ECU system to be deployed offshore on a floating wind turbine.
2024-25	**Final Technology Qualification [TRL8]**	‣ **Onshore qualification and grid-compliance as the only remaining step before market entry**
2026	Secure 1st Offshore Project	‣ x7 Wind Developers have declared their interest to deploy FLASC in their wind farms after qualification
2027-30		‣ Roll-out FLASC systems across North Sea wind farms: 20 units by 2030



EIC Accelerator



European Innovation Council

Interreg Vlaanderen-Nederland

Gefinancierd door de Europese Unie

Horizon2020 European Union Funding for Research & Innovation

Rijksdienst voor Ondernemend Nederland

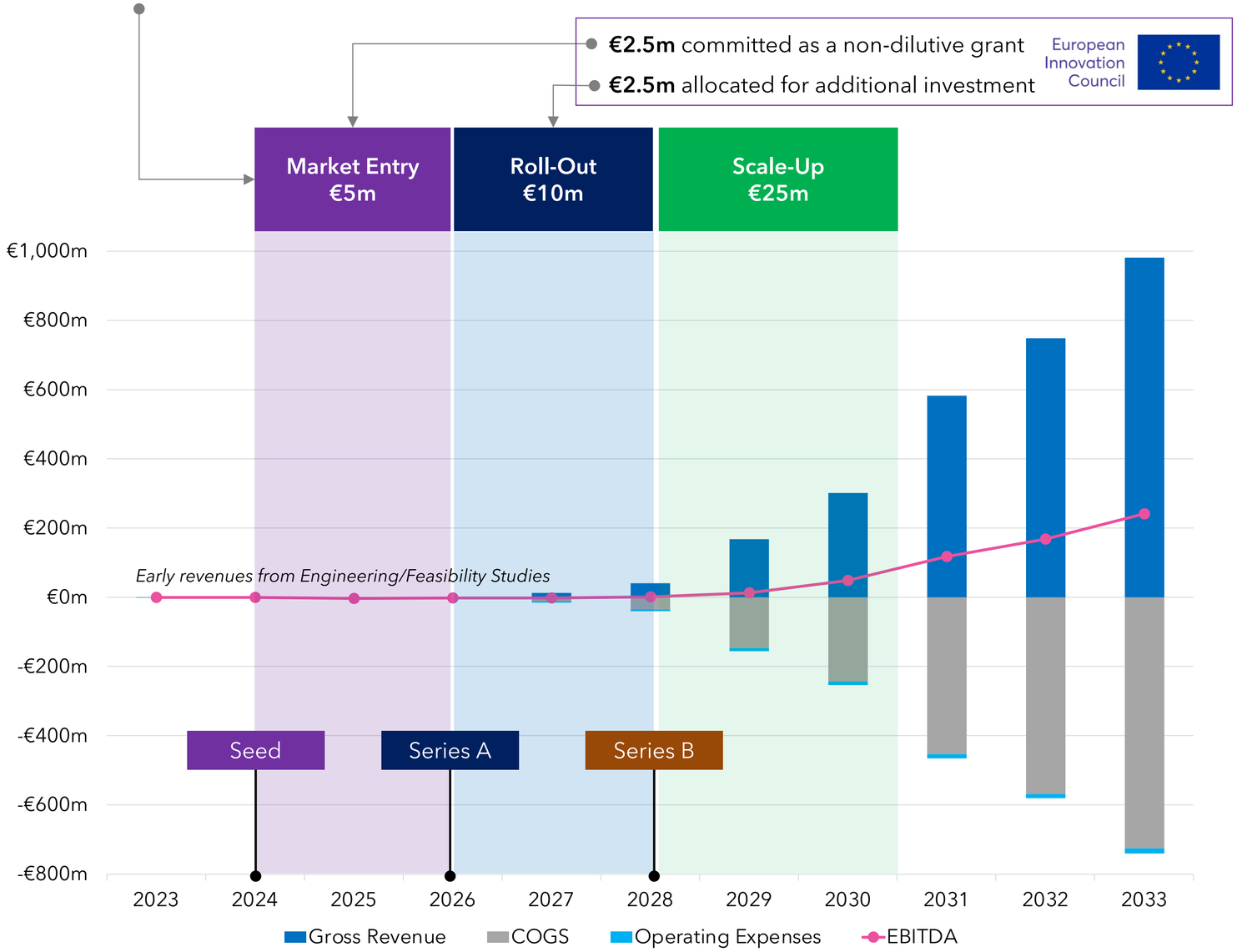
Department for Energy Security & Net Zero

PowerUp! by EIT InnoEnergy

BLUE INVEST

Financial Projections & Funding Strategy

- Current funding need: **€2.5m** to co-finance Market Entry



Key Milestones:

- **2024-2026:** Technology Qualification (TRL 8)
- **2026:** 1st commercial project committed
- **2028:** Series B Scale-up Round (€25m)
- **2030:** €300m revenues (20 Units)
- **2040:** >5GWh FLASC storage (1% of LDES market[1])

+1billion tons of CO2 avoided by 2040

[1] McKinsey & Company, Net-Zero Power: Long Duration Energy Storage for a Renewable Grid (2021)

Funding Need: Seed Round (2024 – 2026)

- Seeking **€2.5m** in additional co-financing
- Preference is for a Convertible Note / SAFE that will convert at Series A (2026)

European Innovation Council

€2.5m already committed as grant funding from the **EIC Accelerator** (Nov-2023 cut-off)

Funding need to Prepare for Market Entry (2024-26):

- Build ECU module and obtain third-party qualification (DNV)
- Grow the team (+6 FTEs) to support development and market entry
- Secure first commercial-scale project

Summary

FLASC is addressing **supply–demand** mismatch for offshore wind

Bringing 10-20% in additional revenue to offshore wind farms

Cost-competitive with the cheapest land-based storage

Working with the world's leading wind developers and delivery partners

European Innovation Council

- Supported by the EU's most prestigious funding scheme for disruptive high-impact innovation

- Seeking **€2.5m** to prepare for market entry

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FLASC B.V. is a spin-off from the University of Malta, established in The Netherlands with registration number: 76566404. The company is part of the Buccaneer Delft energy & offshore accelerator.