



# Network connectivity through stratospheric drones

# Our mission

To provide unique advantages of high-altitude platforms to enable autonomous connectivity and surveillance opportunities



# Our company

- Founded in 2021, in Estonia.
- 5 team members with broad experience in business development, drones, communication systems, satellites and space technologies.
- Supported by the EIT Climate-KIC, CleanTech Estonia and ClimAccelerator Baltics & Slovakia.
- R&D tests ongoing in collaboration with Tallinn University of Technology and The University of Tartu.
- Already sent two satellites into space and performed seven stratospheric experiments.

# Team



Liina Freivald  
CEO

- +20 years in business development related with IT management as IT Project Portfolio Manager at Swedbank.
- Senior Program Manager at Microsoft



Rauno Gordon  
CTO

- +15 years and PhD. in Physics, Electronics and Biomedical Engineering.
- Position as Space Center Manager at Tallinn University of Technology



Timmu Tollimägi  
Chief Engineer

- +5 years in Mechatronics in positions at EnergeX Energy Experts as Mechatronics expert
- Tõmmits OÜ as consultant
- CEO at Unsinkable Robotics OÜ.



Maksim Maljutin  
Architect

- +20 years in computer & information sciences as programmer
- Software developer at companies as PRIA, Softronic, Videobet, Satprof and Proekspert AS



Maximilian-Peter Werner  
Account Manager

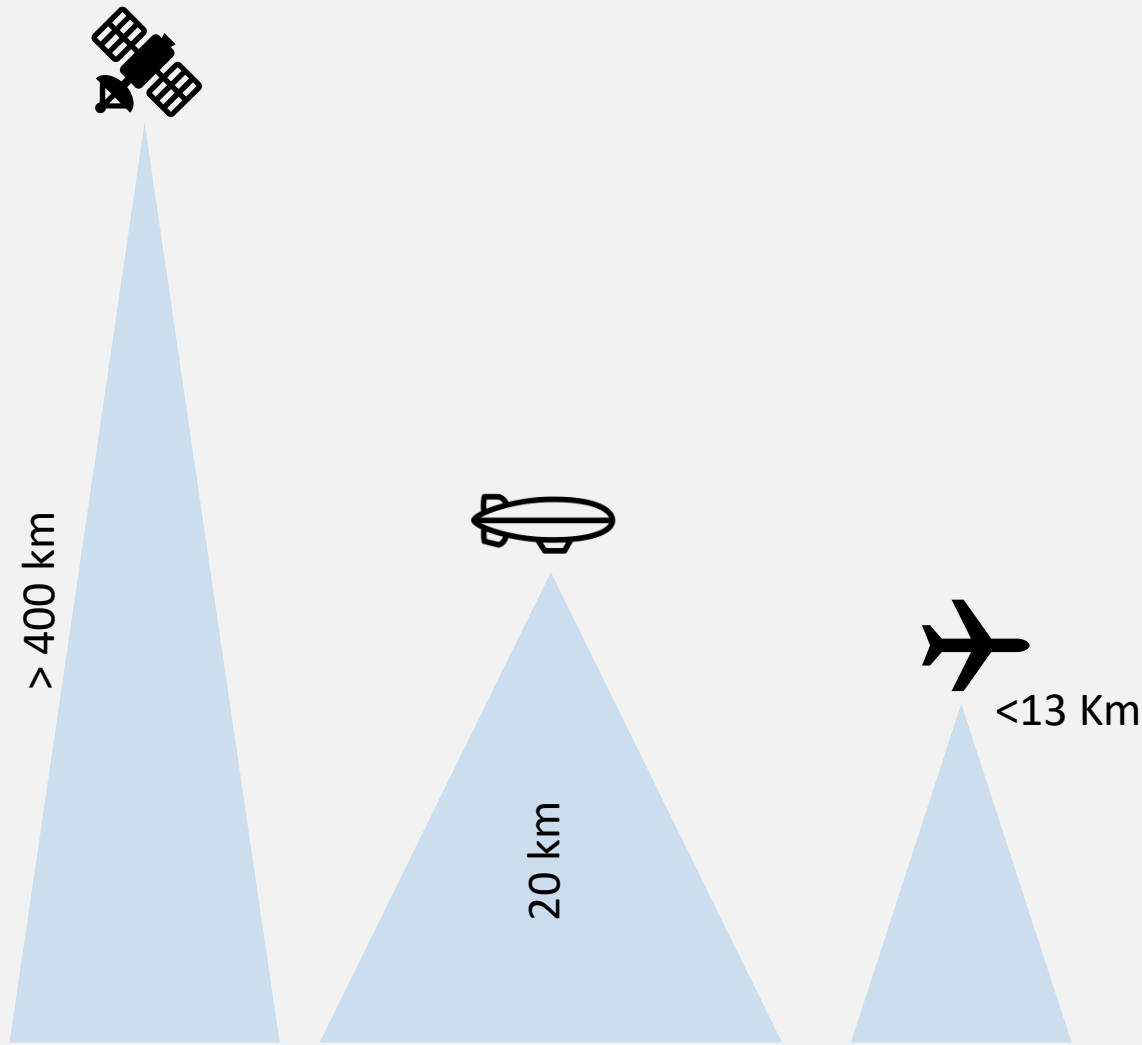
# The Problem



- Space debris consists of discarded launch vehicles and parts of spacecraft, which speed around hundreds of miles above Earth.
- According to NASA, there are about 9,000 metric tonnes of debris scattered throughout space.
- An average of one cataloged piece of debris has fallen back to Earth each day for the past 50 years.
- Space debris could cause significant damage to a satellite or a spacecraft in case of a collision.
- Not only a hazard, but space debris also increases the cost for satellite operators.

**This growing volume of space debris is threatening all satellite-enabled services, from GPS to Earth observation. There is a compelling need for an alternative as conventional satellites create space debris and are very expensive to manufacture and send to orbit.**

# Innovation: VAAL HAPS



- To be propelled into near-space, VAAL Airships is developing VAAL HAPS (High-Altitude Pseudo Satellites).
- VAAL stratospheric vehicle is a steerable balloon (blimp) together with a payload (tele-communication equipment) and control systems.
- VAAL HAPS can supply 4G, 5G, and IoT services – acting as a terrestrial cell tower that can receive signals even far away from urban areas.
- VAAL operates at much lower altitudes than satellites and are capable of continuously covering a specific region significantly more effectively.
- VAAL HAPS can be launched on demand and are simple to deploy anywhere, lowering the launch costs.

# Value Proposition

## Willingness to pay:

- 100x more cost-effective than an internet satellite.
- 10x smaller CO2 footprint (102 tonnes less per flight).
- 0x added space debris.
- Much higher internet speeds and under 100ms lower internet latency.
- Increased precision in localization-navigation services.
- High resolution imaging with up to 10 cm/px.



### Unique

24/7 coverage from a single platform



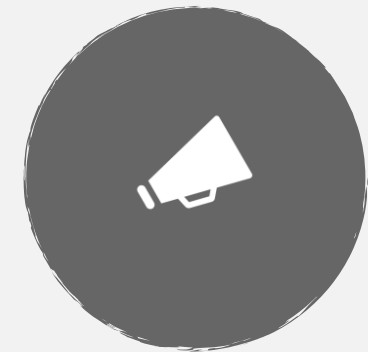
### Cost

HAPS are comparatively less expensive and can be maintained and upgraded easily



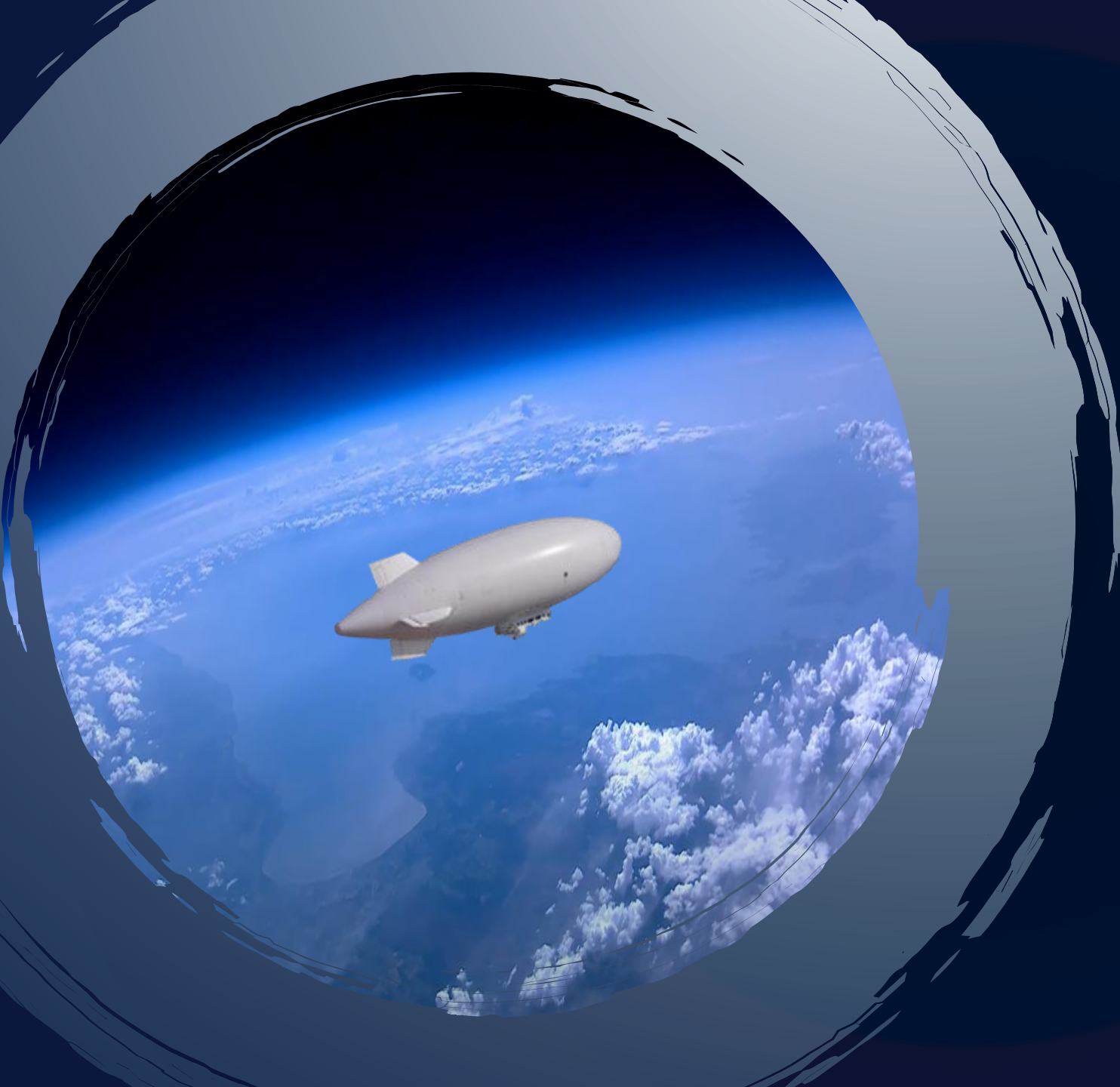
### Connection

Better telecommunications and lower latency compared to satellites



### Novelty

HAPS is a new platform for many services, and give advantages over satellites



# Unique selling point

- VAAL HAPS system does not generate space debris.
- Its monitoring and communications have lower latency and capture higher resolution images.
- The communication is faster because the distance to the ground is over 15 times less and no big constellation is required for continuous coverage.
- The final service may be cheaper for the target group.

# Market opportunity

**\$10B**

**Total Addressable Market**

Global small satellite  
market

**€64M**

**Serviceable Addressable  
Market**

Global High altitude  
Pseudo Satellites

**€35M**

**Serviceable Obtainable  
Market**

European High-  
altitude Pseudo  
Satellites (HAPS)  
market





# Market position

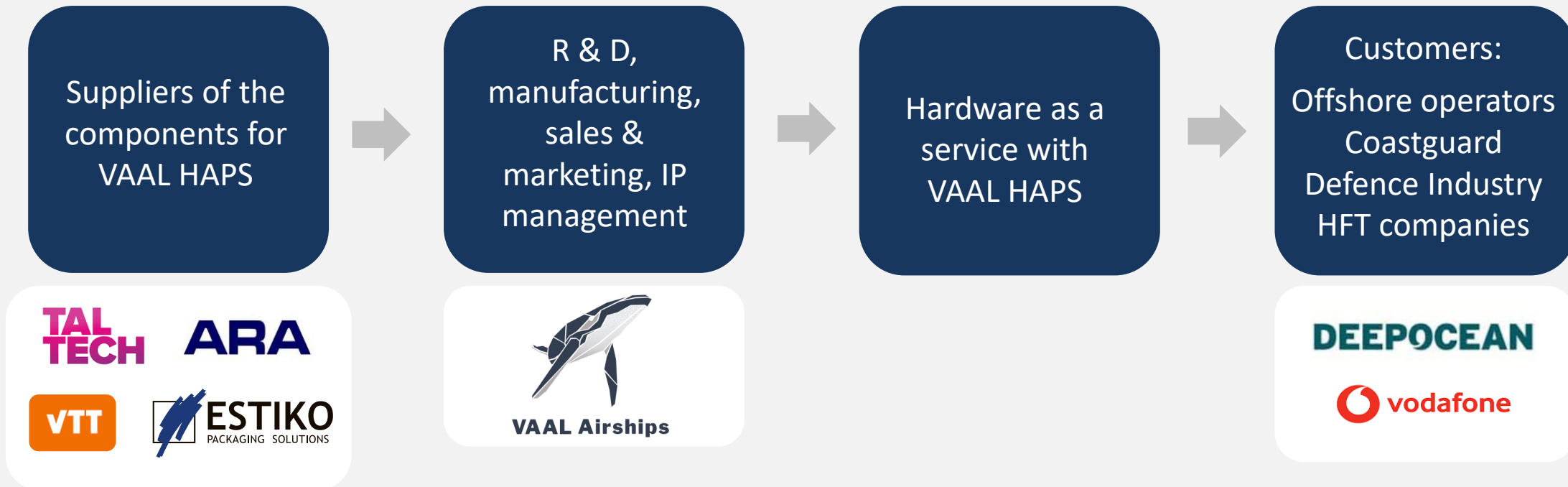
## Commercial opportunity

- The global small satellite market is expected to grow at a CAGR of 12.55%.
- High-altitude Pseudo Satellites (HAPS) market is expected to grow at a CAGR of 7.71%

## Key market drivers:

- Growing demand for satellite communication services
- Surging demand for the drones for surveillance and civil applications

# Value chain



# Competition

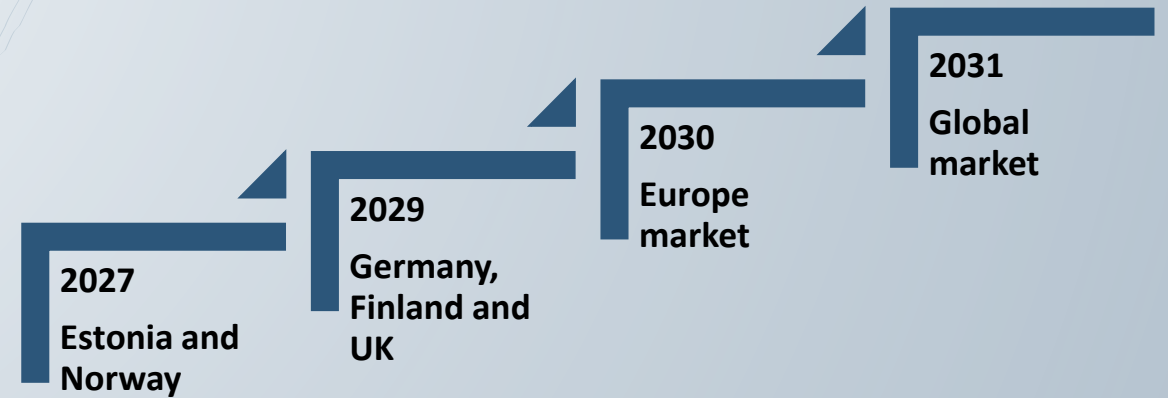
Market Product	Space debris creator and expensive rockets to reach their operational altitude	Communication quality	Price	Status/requirements
<i>Geostationary satellites</i>	Yes	High latency, low bandwidth	10 k€ per 1Mbps connection per month.	Requires large receiver disk
<i>Starlink new satellite</i>	Yes	Low latency, medium bandwidth	500€/month for 150-500Mbps.	Requires large receiver disk
<i>Thales-Alenia</i>	No	Low latency, good bandwidth	Very high	Not Available yet
<i>Airbus</i>	No	Low latency, good bandwidth	Very high	Not Available yet
<i>SCEYE</i>	No	Low latency, medium bandwidth	High	Not Available yet
<i>Stratosyst</i>	No	Low latency, low bandwidth	High	Not Available yet
<i>Drones</i>	No	Low latency, high bandwidth, ultra-short duration	Not feasible	feasible due to very short flight time
 <b>VAAL Airships</b>	No	Low latency, high bandwidth, long duration. 5G provided to mobile phones and IoT devices.	1Gb connection on demand anywhere for 10k\$/month	Internet can be accessed directly by mobile users. The HAPS is stationary so constant area coverage requires only 1 HAPS

# Commercialization Strategy

- B2B HaaS model
- Contract based

## Revenue:

- Offshore operators: €120k/year (1 HAPS)
- Coast Guard: €400k/year (2 HAPS)
- Defense industry: €1M/year (at least 2 HAPS)
- HFT companies: €10M/year (20 HAPS)



## Market traction



## Partners



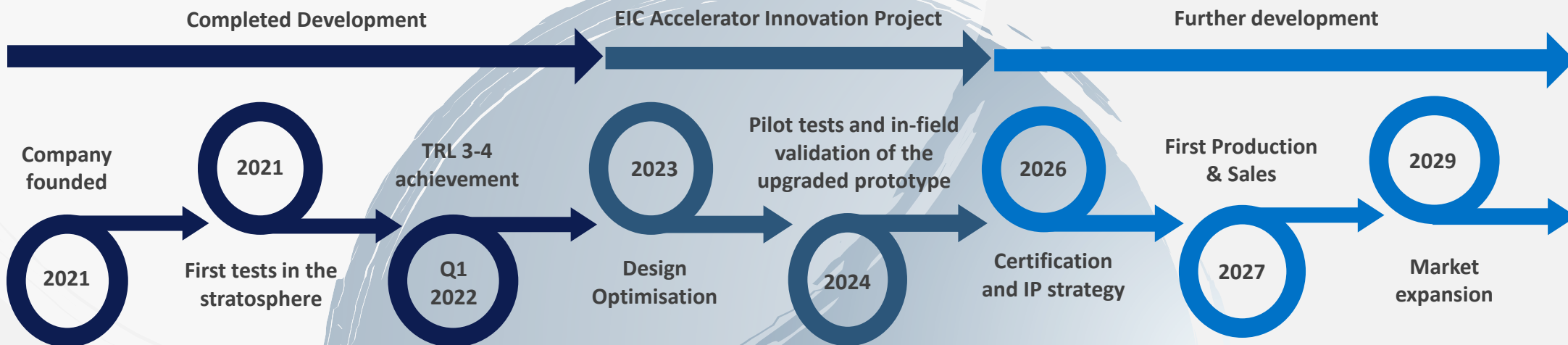
# Financial plan

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Coast Guard	0	0	0	1*	5*	8	12	20	31	56
Defence industry	0	0	0	0	0	1	2	3	4	5
HFT companies	0	0	0	0	0	0	0	0	0	1
Offshore operators	0	0	0	1*	5*	8	12	20	31	56
<b>Total Revenues</b>	0	0	0	€0,52M*	€2,6M*	€5,16M	€8,24M	€13,4M	€20,12M	€44,12M
<b>COGS</b>	0	0	0	€0,31M	€0,95M	€2,1M	€3,53M	6,72M	€9,07M	€16,7M
<b>Fixed Costs</b>	€0,70M	€0,90M	€1,03M	€1,69M	€2,20M	€2,86M	€3,71M	€4,83M	€6,27M	€8,16M
<b>Net income</b>	-€0,70M	-€0,90M	-€1,30M	-€1,48M	-€0,55M	€0,20M	€1,00M	€1,85M	€4,78M	€19,26M
<b>Employees</b>	4	6	9	14	20	27	37	50	67	91

# Assumptions

- Paying pilots in 2025 and 2026
- BEP in 2030
- COGS include mainly technology cost, maintenance, and other operational costs.
- Fixed costs include personnel costs, R&D activities, sales and business development, administration, legal & IP teams and office rent.

# Product Development Roadmap



# THANK YOU

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