



Network connectivity through stratospheric drones

Our mission

To provide unique advantages of high-altitude platforms to allow 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

Software Developer

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



Susanna Freivald

Project Coordinator

- Project management degree from Tallinn School of Economics, managing social media, documentation, and budgets.

The Problem

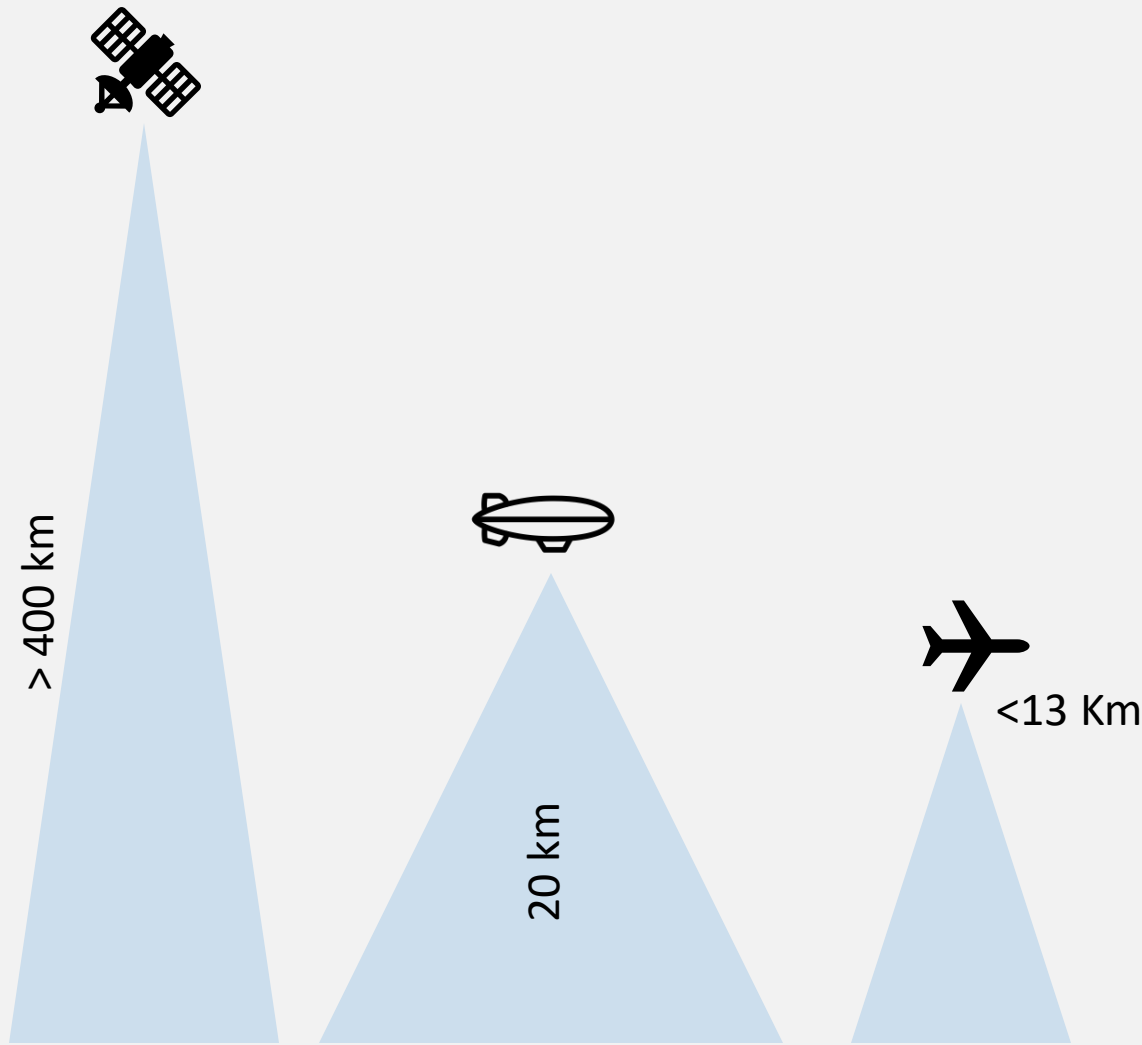


- Space debris consists of discarded launch vehicles and parts of spacecraft, which speed around hundreds of miles above Earth.
- According to NASA, there are about 9,000 metric tonnes of debris scattered throughout space.
- An average of one cataloged piece of debris has fallen back to Earth each day 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

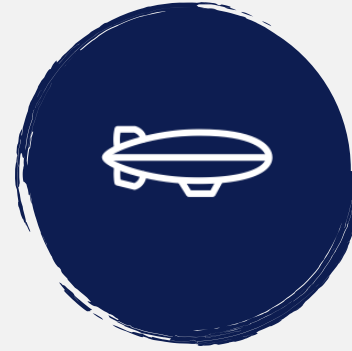


- To be propelled into near-space, VAAL Airships is developing VAAL HAPS (High-Altitude Pseudo Satellites).
- VAAL stratospheric vehicle is a steerable balloon (blimp) together with a payload (tele-communication equipment) and control systems.
- VAAL HAPS can supply 4G, 5G, and IoT services – acting 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



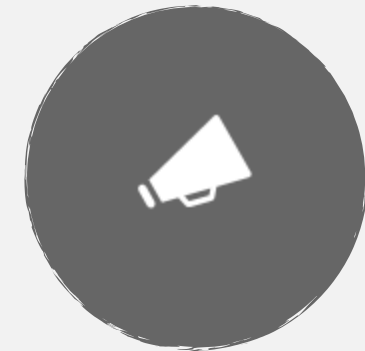
Cost

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

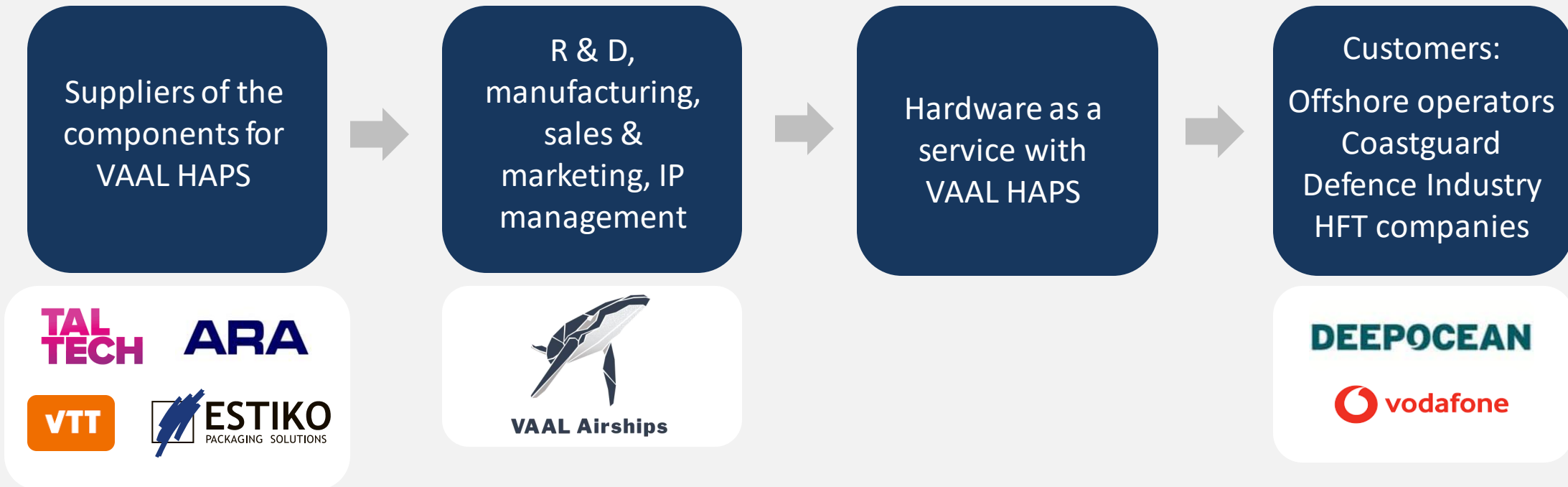
Commercial opportunity

- 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

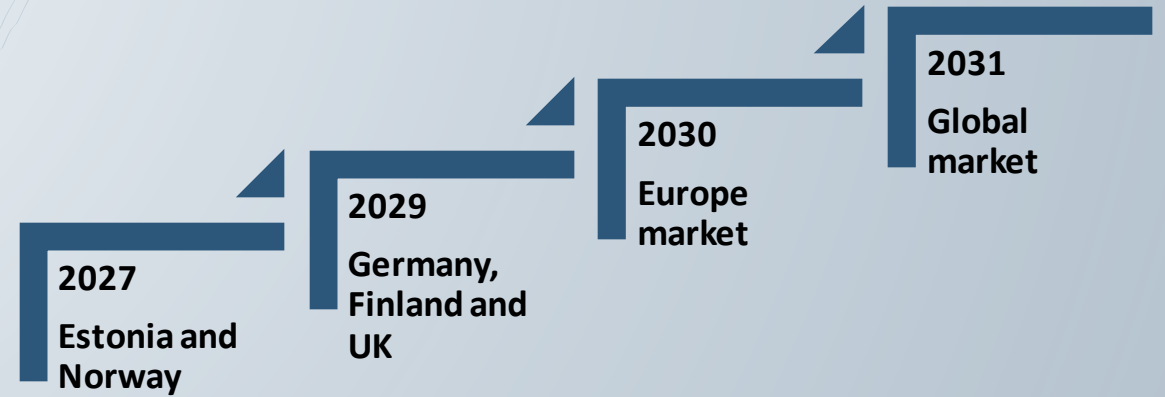
Market Product	Space debris creator and expensive rockets to reach their operational altitude	Communication quality	Price	Status/requirements
<i>Geostationary satellites</i>	Yes	High latency, low bandwidth	10 k€ per 1Mbps connection per month.	Requires large receiver disk
<i>Starlink new satellite</i>	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
 VAAL Airships	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

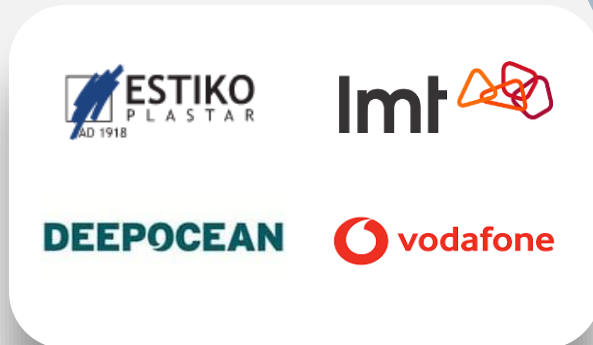
- B2B HaaS model
- Contract based

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



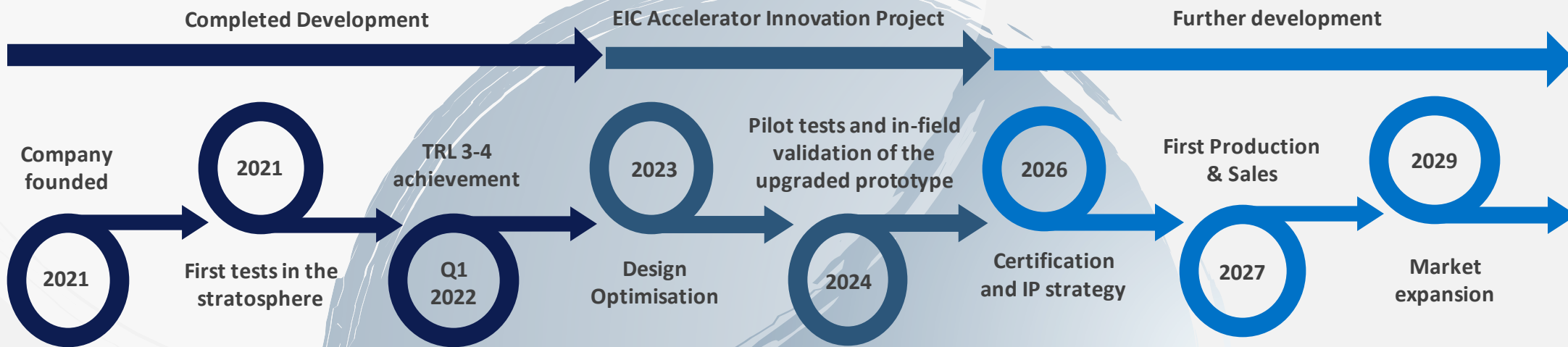
Financial plan

	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
Total Revenues	0	0	0	€0,52M*	€2,6M*	€5,16M	€8,24M	€13,4M	€20,12M	€44,12M
COGS	0	0	0	€0,31M	€0,95M	€2,1M	€3,53M	6,72M	€9,07M	€16,7M
Fixed Costs	€0,70M	€0,90M	€1,03M	€1,69M	€2,20M	€2,86M	€3,71M	€4,83M	€6,27M	€8,16M
Net income	-€0,70M	-€0,90M	-€1,30M	-€1,48M	-€0,55M	€0,20M	€1,00M	€1,85M	€4,78M	€19,26M
Employees	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



THANKYOU

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