Truly **Autonomous** Space Operations Finally **Enabled**

by

SPACE SCAVENGERS

Team

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> 10 years of R&D experience

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CTO
Materials Expert
Multidisciplinary Manager
Business Development

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> 10 years of experience

CIO
Multi-agent Systems Expert
Senior SW Developer

+ 3 volunteers

Problem Definition

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The rapidly evolving space industry, especially in the domain of cooperative missions and satellite constellations, faces significant challenges in **mission planning and execution**. These include the integration of complex spacecraft models, thrusters, sensorics, and inter-satellite communication.

The high costs and technical barriers of current simulation tools hinder efficient mission testing and development, leading to **increased risks and impediments in collaborative space endeavors**.

* GNC - guidance, navigation, control

Problem Definition

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Space scAvengers's idea of usage of autonomous multi-agent systems **recognized by European Space Agency** for Space Transportation System and In-orbit servicing solutions

→ **in-space transportation**, in-orbit servicing, manufacturing, assembly

→ Orbital Servicing missions require new approach of preparation and validation in era of **new space market opportunities**

... but **dedicated automated autonomous software solutions** for **simulations**, GNC and space services are **missing**

* GNC - guidance, navigation, control

Our Solution

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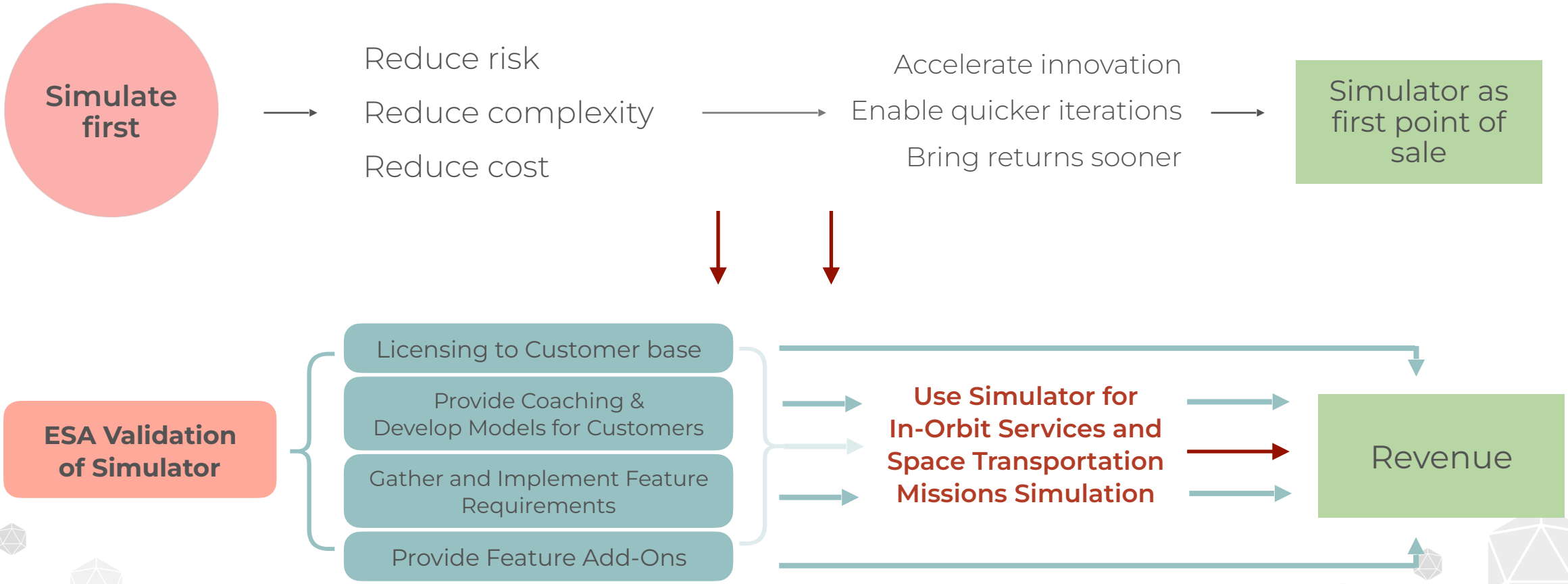
Development of software solutions for servicing missions in Space

Enables validation of automated orbital servicing missions (based on cooperative approach)



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Development of software solutions for servicing missions in Space

Enables validation of automated orbital servicing missions (based on cooperative approach)

ESA proved simulation platform

Simulation environment

Bottom-Up environment

Close-proximity operations

Physical connection simulation

Autonomous operations

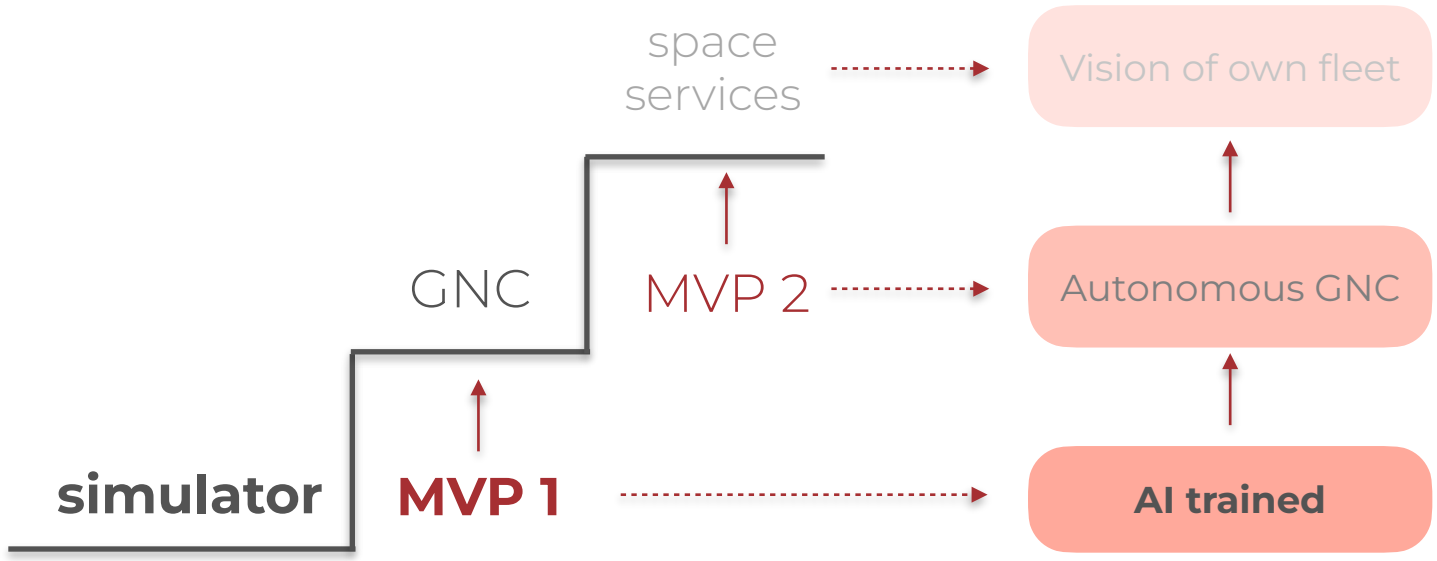
AI training

Collaborative perception

Spacecraft model creation

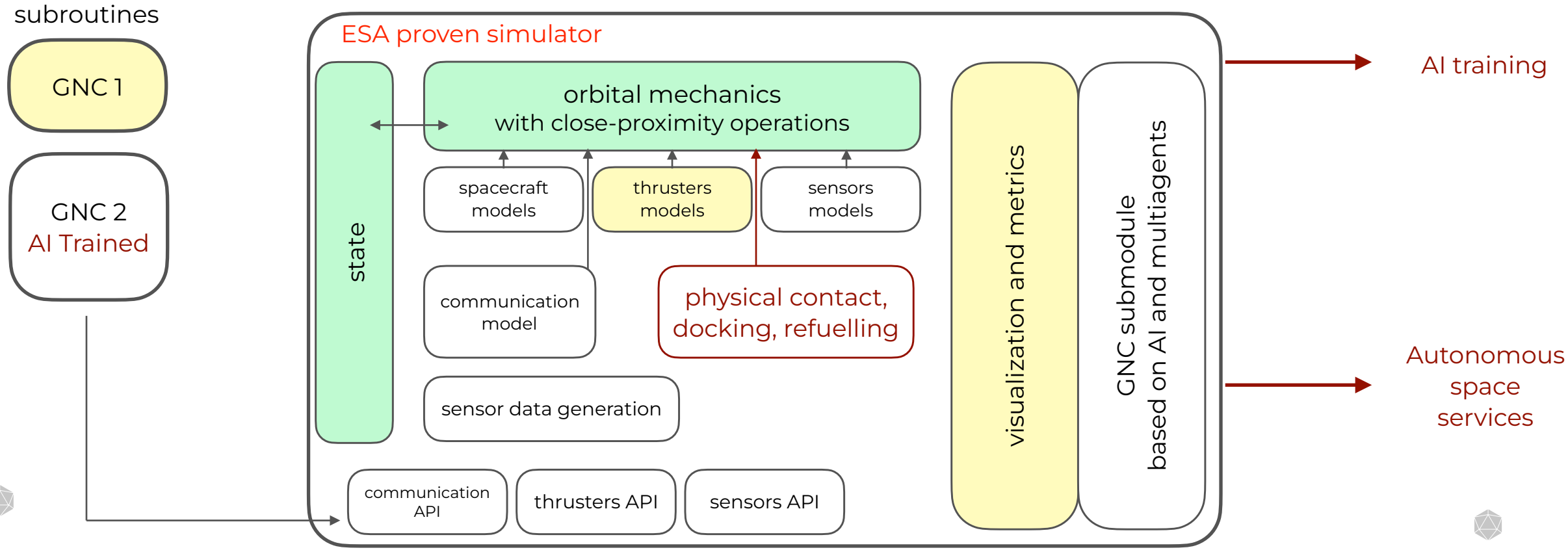
Mission specific requirements

Mission implementation



* GNC - guidance, navigation, control

Ongoing development of simulator tool



* GNC - guidance, navigation, control

Developed | Ongoing | TBD

Current **Competition**

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Simulation SW used for simulation of space missions		FreeFlyer	Ansys	Orbitus ED	PrincetonSATELLITE SYSTEMS
Orbit determination	✓	✓	✓	✓	✓
Manoeuvre modelling	✓	✓	✓	✓	✓
Spacecraft propagation	✓	✓	✓	✓	✓
General analytics	✓	✓	✓	✓	✓
Contact modelling	✓	✓	✗	✓	✗
AI training and decisions (autonomy)	✓	✗	✗	✗	✗
Native inter satellite communication	✓	✓	✗	✗	✗

* importance from perspective of dedication to automated autonomous solution for space services

✓ Integrated in SW

✓ Partially integrated in SW

✗ Not part of SW

Market

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Market Forecast *

$14.3 bn.

in cumulative revenues from
In-Orbit Satellite Services
by 2031

↓

Record # of Launches
New Safety Regulations
Secure Orbits
Sustainable Space

Revenue Stream

Simulator software

↓

First Revenue Stream

↓

GNC solutions

↓

Revenue Stream Continuity

Licences,
Support,
Mission Simulations,
Spacecraft Model Creation
etc.

Customer Base

- **SMEs for CubeSat usage**
- **In-Orbit Servicing Start-ups**
- **ESA**
- NASA
- **Satellite operators**
- **Satellite components producers**
- Universities and Research Institutes
- SpaceX and similar

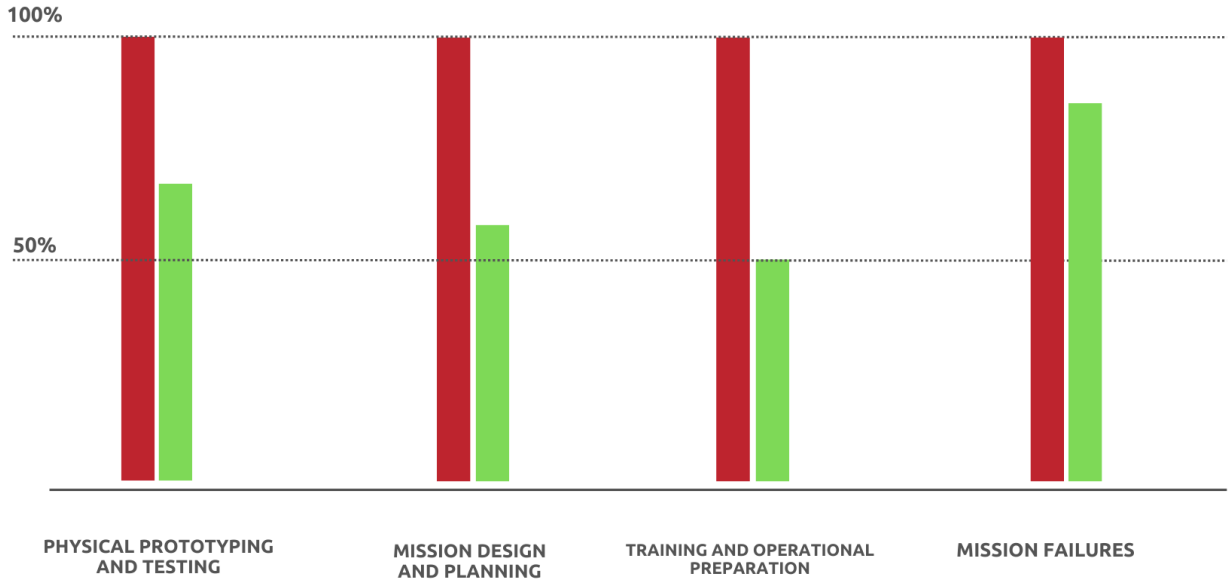
.... etc.

* https://www.nsr.com/?research=in-orbit-services-satellite-servicing-adr-and-ssa-5th-edition

Market

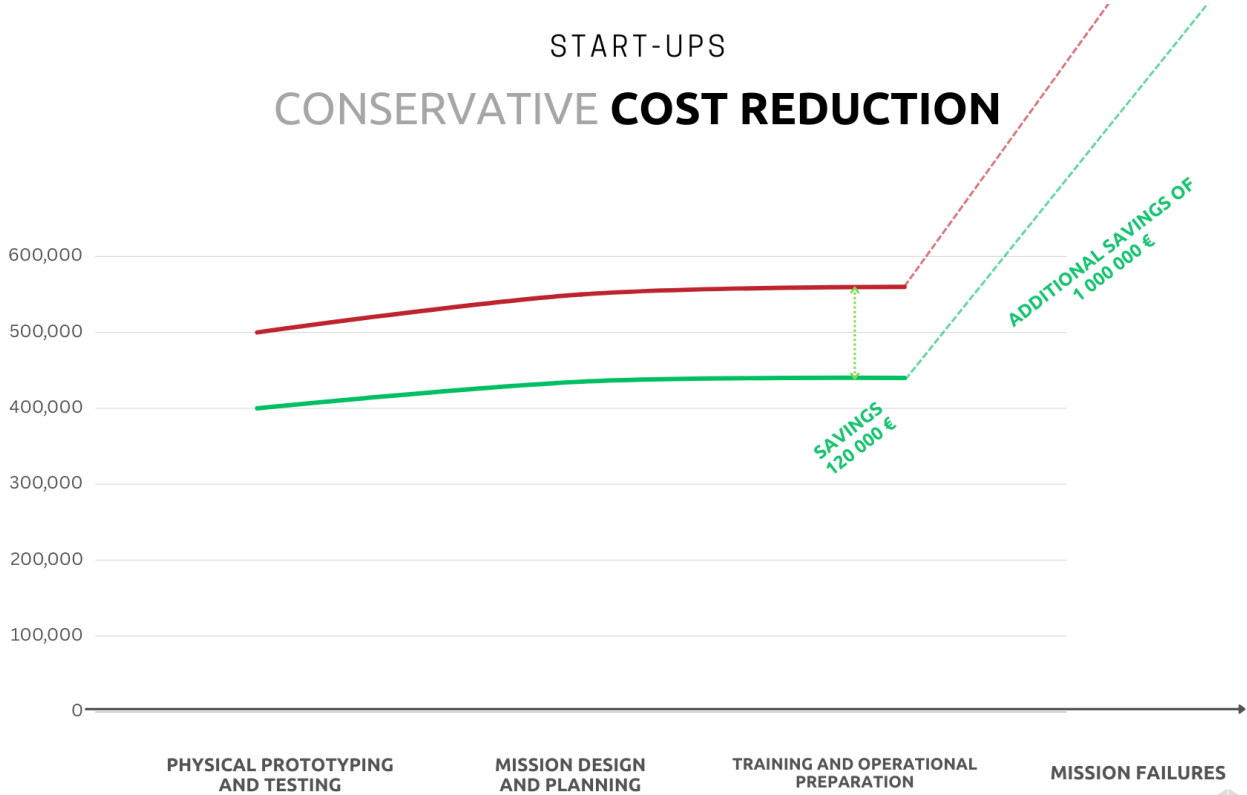
START-UPS

RELATIVE **COST REDUCTION**



START-UPS

CONSERVATIVE **COST REDUCTION**



Space scAvengers's innovative simulator, designed for the rapidly expanding **small satellite sector**, offers a **unique solution to the high costs and risks associated with space missions**. Tailored for **emerging space startups and smaller agencies**, our simulator is a strategic asset, crucial for mission planning and reducing potential failures. With capabilities like AI-driven models, GNC systems, and inter-satellite communication, it's poised to revolutionize mission planning and execution. This aligns perfectly with the **needs of constellation producers**, who could **save millions** in development and testing, as well as Earth observation pioneers like Planet Labs, potentially saving them up to $2 million in operational efficiency.

Roadmap

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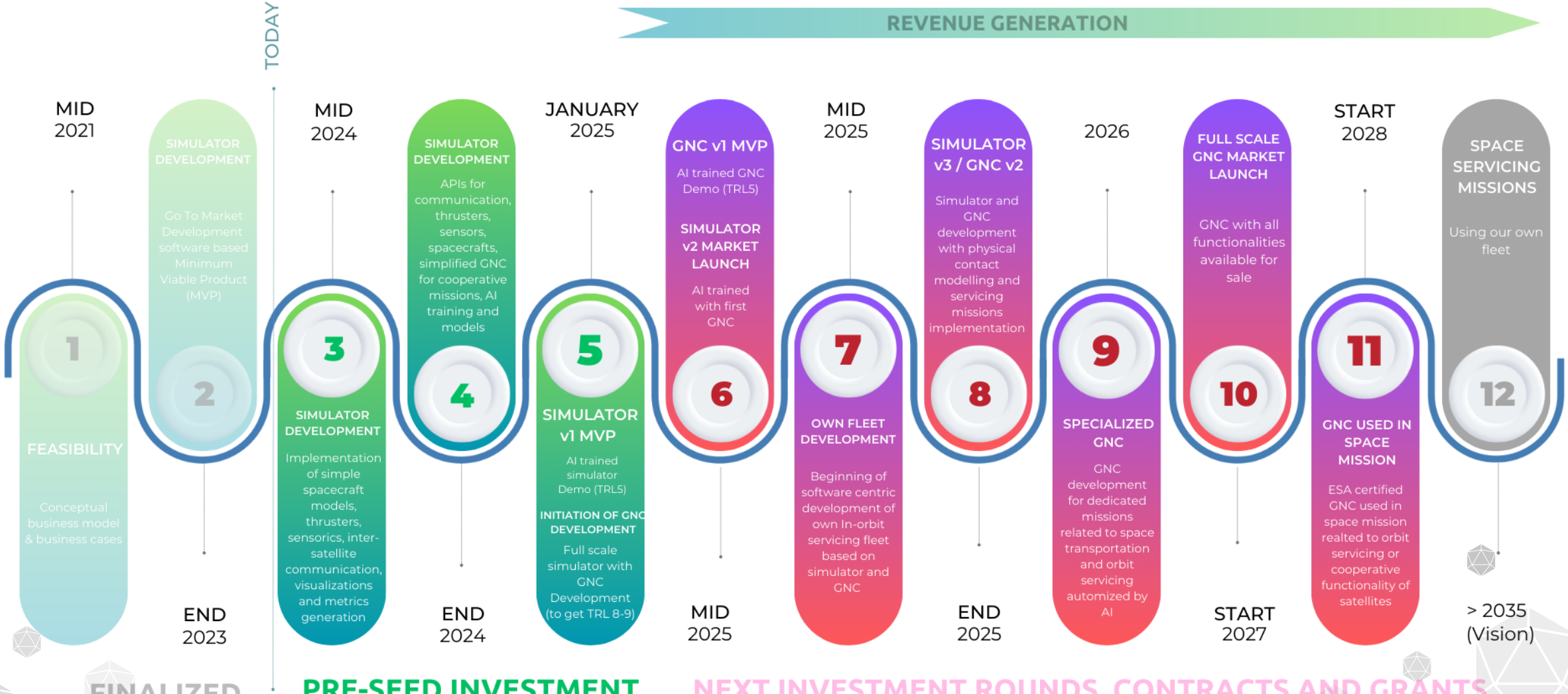

Revenue Predictions

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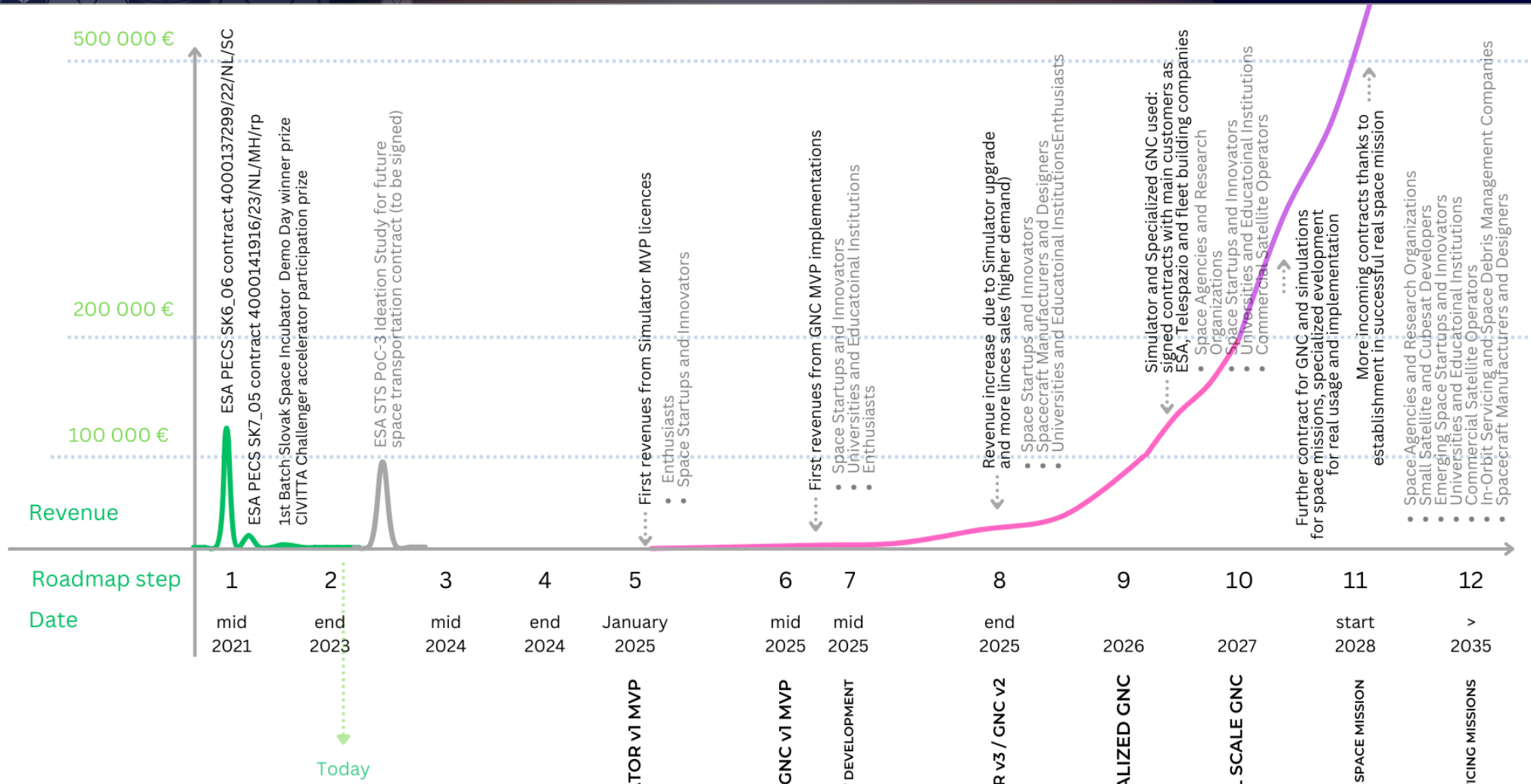

ESTIMATED

REVENUE STREAMS

Partners & Grants

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Simulator development and connection mechanism testing and validation

→ Partially covered by ESA PECS 6 & 7 projects

esa

TELESPAZIO a LEONARDO and THALES company

REDWIRE

nano avionics

SLOVAK SPACE OFFICE

MAGICS

AstroS solutions

PRVÁ ZVÁRAČSKÁ, a. s.

STU FEI

STAM

POLITECNICO MILANO 1863

eit Climate-KIC

Co-funded by the European Union

AIRBUS DEFENCE & SPACE First contact established

* Potential customer

Our Ask

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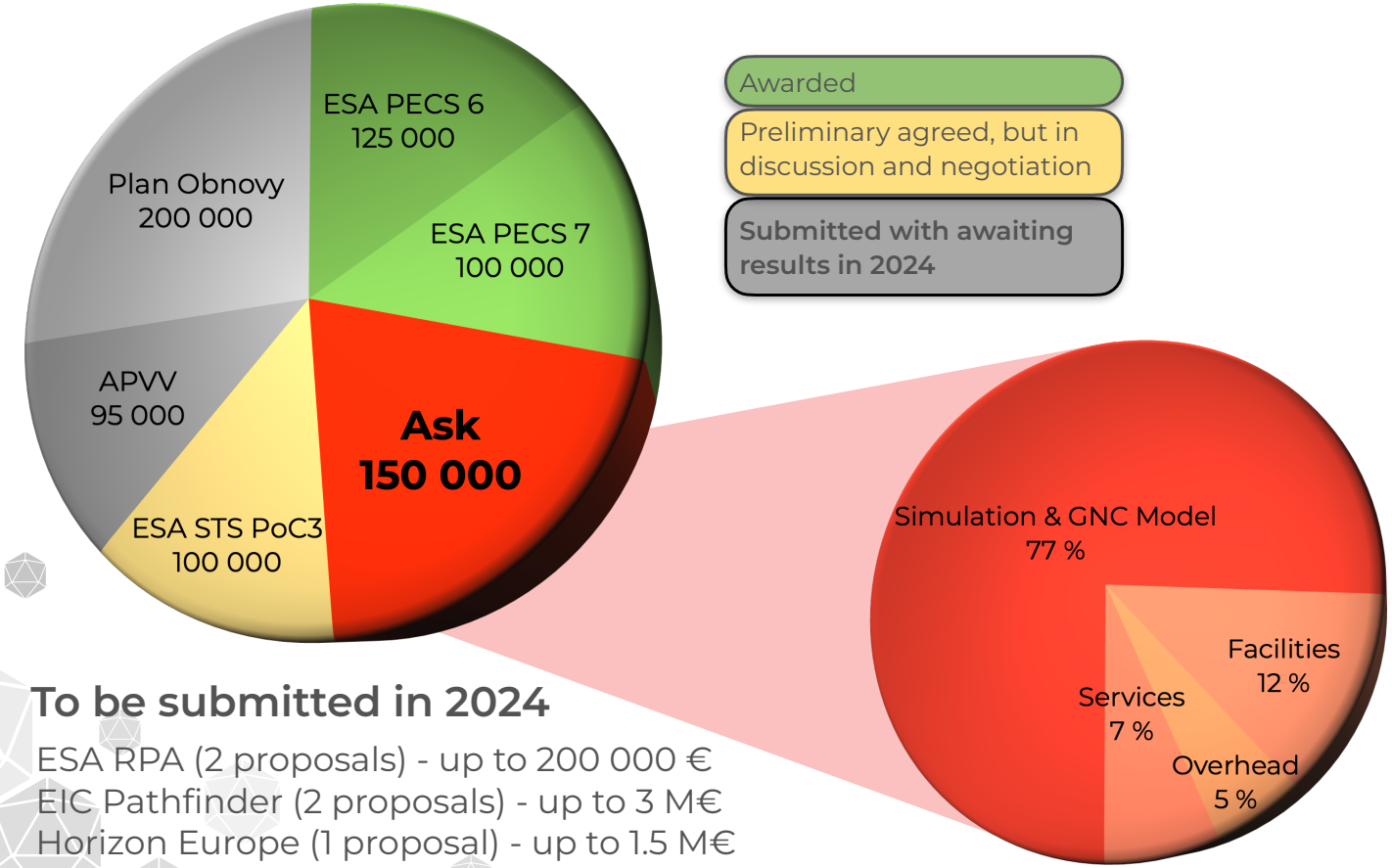
Current ask

(Pre-seed – 12 Months duration)

150 000 €

To bridge over time-period until financing from potential grants becomes available



To be submitted in 2024

ESA RPA (2 proposals) - up to 200 000 €
EIC Pathfinder (2 proposals) - up to 3 M€
Horizon Europe (1 proposal) - up to 1.5 M€

Our Ask

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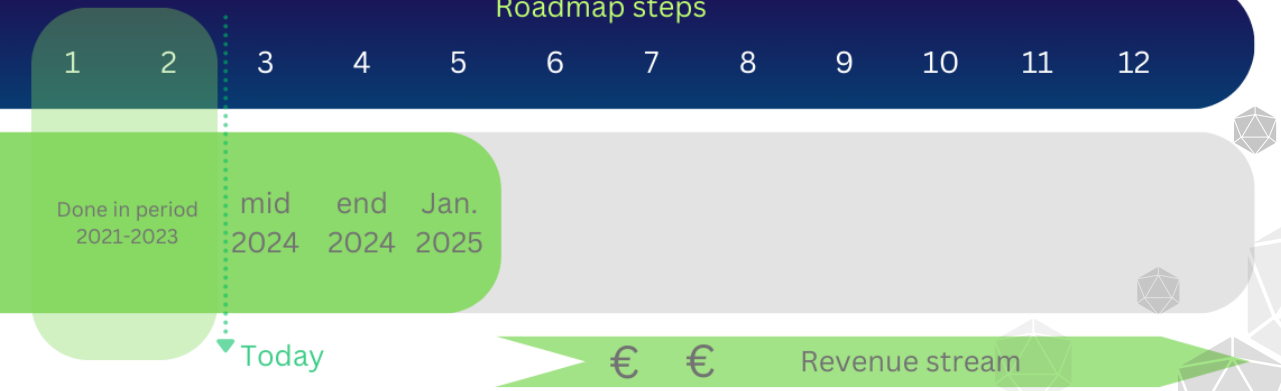
INVESTMENT ASK

PRE-SEED ROUND

Investment	Equity	Achievements and deliverables	Roadmap steps	Timeline reduction	Revenue generation	Hire
150 000 €	**10%**	Focus on simulator development until v2 of it is achieved • Implementation of simple spacecraft models, thrusters, sensorics, inter-satellite communication • APIs for communication, thrusters, sensors, spacecrafts • Simplified GNC for cooperative missions • Visualizations and metrics generation • Simplified AI training and models **Output**: Simulator MVP at level TRL 5 as usable Demo version which can be already licenced and generate revenue	1 2 3 4 5	**None** Ends: Jan. 2025	€	**None**

Investment	Equity	Duration	Timeline reduction	Hire
150 000 €	**10%**	**12 mo.**	**None**	**None**



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