

# Space for Sustainable Pharma

ESA Webinar

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# Welcome to the Webinar!

Before we start...

- Please keep your microphones muted during the webinar and make sure your webcam is switched off.
- You can use the conversation function anytime to submit your questions. They will be addressed during the Q&A at the end of the webinar



ESA Welcome and **Introduction**

About ESA's **Space for Sustainable Pharma** competition

Sustainability in the pharmaceutical industry and **Space**

**How to Apply** to the competition

**Q&A** Session



# The European Space Agency

## EUROPE'S GATEWAY TO SPACE

### WHAT

22 Member States, 5000 employees

### WHY

Exploration and use of space for exclusively peaceful purposes

### WHERE

HQ in Paris, 7 sites across Europe and a spaceport in French Guiana

### HOW MUCH

€6.49 billion = €12 per European per year



A large white rocket with multiple boosters is shown in the process of launching from Earth. The Earth's blue and white atmosphere is visible in the background. The rocket is angled upwards, and a bright flame is visible at its base.

space transportation

A large, dark, irregularly shaped asteroid or comet nucleus is shown in space. It has a rough, textured surface and is surrounded by a faint, glowing atmosphere or dust trail. The background is the blackness of space.A close-up view of an astronaut's face through the clear visor of a white space helmet. The astronaut is smiling slightly. The helmet has various instruments and a small patch on the side. The background is the bright blue and white curve of the Earth.A satellite view of a coastal region, showing a complex network of green land, blue water, and white snow or ice. The terrain is rugged and mountainous, with a large body of water in the foreground.A satellite in orbit around the Earth, with a large dish antenna pointing towards the planet. The satellite is connected to the Earth by a network of lines, representing data transmission. The Earth is shown in a perspective view, with the satellite's orbit clearly visible.A diagram of a satellite navigation system. The Earth is shown in the center, surrounded by several orbits. Multiple satellites are positioned along these orbits, with lines connecting them to the Earth, representing the global navigation satellite system.A Mars rover is shown on the surface of Mars. The rover is a six-wheeled vehicle with a large solar panel and a communication dish. The background shows the reddish-brown desert landscape of Mars under a hazy sky.A control room with multiple operators working at desks equipped with numerous computer monitors. The room is dimly lit, with the glow from the screens providing the primary light source. The operators are focused on their work, and the room is filled with technical equipment.A person wearing a virtual reality headset and a hand controller. The person is looking towards the camera, and the hand controller is held up in the foreground. The background is blurred, showing other people in a similar setting.

# Business Applications: space-enabled services

BASS aims at reaching **commercial exploitation of space assets, data and capabilities** addressing

**technical feasibility and business development.**

This includes the development of **operational services for a wide range of users** through the combination of different systems, and **support in creating viable companies as well as to existing companies**



# What can BASS offer to companies?

## Your Business Powered by Space:



Zero-equity funding (from €50k to €2M+ per activity)

A personalised ESA consultant

Technical support and commercial guidance

Tailored project management support

Access to our international network of ESA and partners

Access to our network of investors

Credibility of the ESA brand



# Sustainability elements of space applications



**PEOPLE**  
Social value



**PLANET**  
Green value



**PROFIT**  
Commercial value





# Space for Sustainable Pharma



# Background: Pharmaceutical sector

- The **pharmaceutical sector** is crucial for improving human and animal health.
  - Cure diseases.
  - Neutralize symptoms.
  - Delay the onset of diseases.
- **Boosting life expectancy and quality of life.**
- **But impact on the environment:**
  - Polluting the air, water and soils.
  - AMR: Impact the health of others negatively.
  - API require proper disposal.
  - Waste creation: Drug packaging.
- Reaction from WHO, EFPIA, UNEP and EEB to promote the implementation of circular economy in pharma to tackle those challenges.





Disposal of unused & expired medicine.



Digital Twin for sustainable pharma.



Circularity in the pharmaceutical industry.

## Problem description:

- **Waste generation:**
  - In the UK, yearly, 354 million EUR.
  - In France, in 2018, 260kg/ capita.
  - In general, 3-8% of the sold drugs.
- Wrong disposal leads to **AMR**.

## Solutions: Decrease number of drugs thrown away.

- Just-in-Time approach.
- Efficient logistics.
- Collection of expired medicines.
- Raise citizens' awareness.



Digital Twin (DT) has many advantages as it enables to deploy and prove solutions faster and at a lower cost, reducing risks, etc. This can also be used for the pharmaceuticals.

## 1. Operation management:

- Reduce the environmental impact of manufacturing process of pharmaceuticals.
- Shift to renewable energy: comparing different renewable energy systems.
- Assessment of machinery conditions to maximize their lifespan.

## 2. Drug development:

- Time-consuming and expensive.
- Influences 80% of the environmental impact a drug will have.
- Reduces the risk of testing, cuts down the cost of development process and optimizes processes while minimizing the impact on the environment

## 3. Personalized medicines:

- Optimal treatment: optimal drug and dosage choice.
- Real-time data from sensors combined to clinical DT.



Each kg of medicine = 100 kg of waste. **Circular pharma**, therefore, aims to minimize waste creation throughout the whole life cycle of medicines and promotes recyclability.

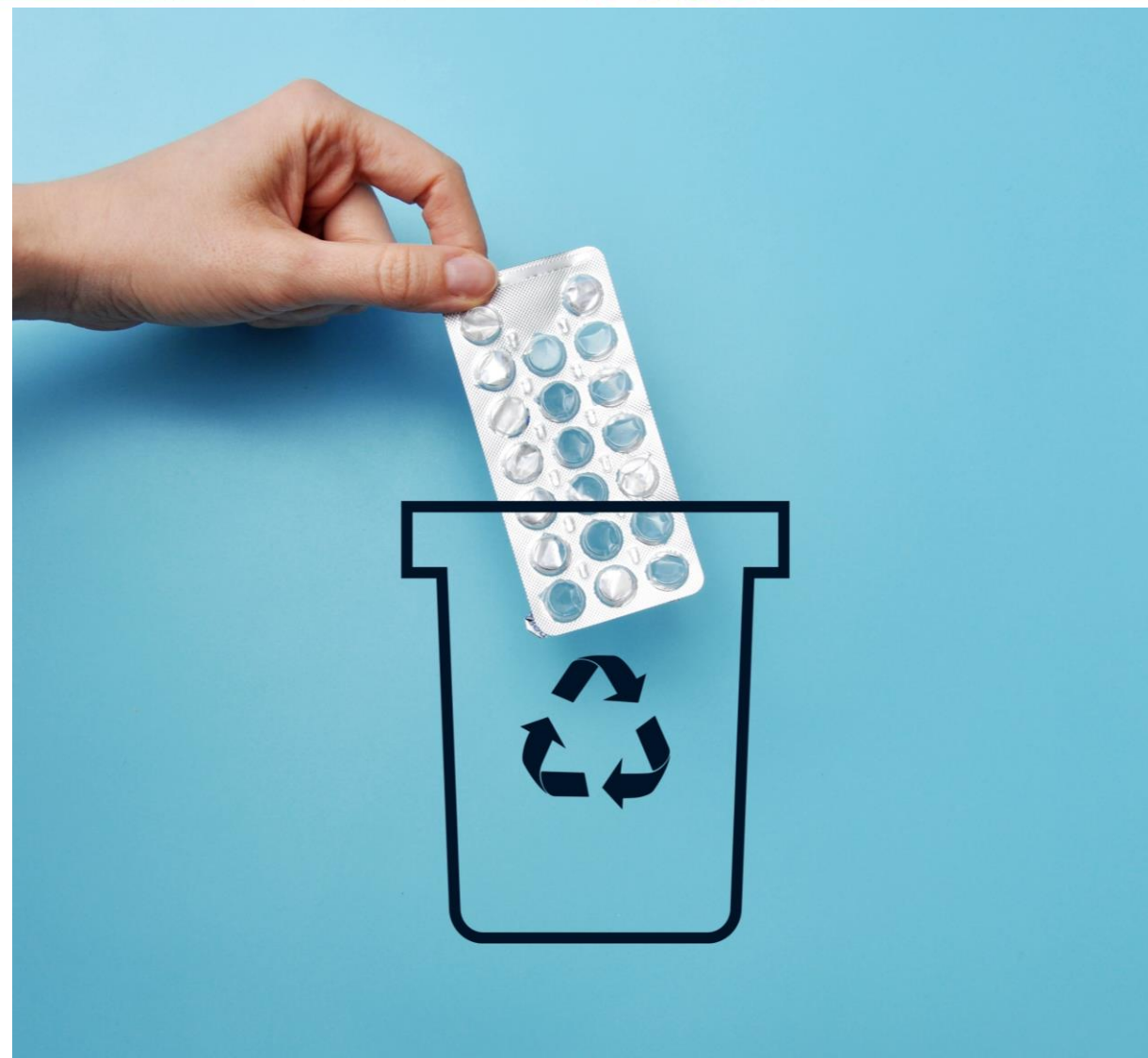
## 1. Water recycling:

- APIs are discharged through urine, contaminating water and soils.
- Address the impact of pharma on water both during chemistry/ production process and after excretion.

## 2. Machinery recycling:

- In 2023, pharma manufacturing equipment was worth 14.5 billion USD. Rapidly outdated.
- Solutions: Monitoring the machines conditions the aim to optimize their life expectancy, collection of outdated equipment and the development of recycling techniques.

## 3. Packaging recycling: focuses both on the collection of contaminated packaging and sustainable purifying solutions before recycling.







# Space for Sustainable Pharma: How to apply?



## Who can apply?

To be eligible for funding, your team must be based in one of the following countries:

Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxembourg, The Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Sweden, Switzerland and United Kingdom.

If you are considering applying, you must inform **your National Delegation to obtain a letter of authorisation** allowing the funding of the proposed activity. Contact details of each National Delegate can be found here: <https://business.esa.int/national-delegations-0>

However, if your team is based in **Germany, Luxembourg, Slovenia, and the United Kingdom** you do not have to contact your National Delegate.



# How to apply?

1. Register your team on [esa-star Registration](https://esastar-emr.sso.esa.int) today!  
<https://esastar-emr.sso.esa.int>
2. On the 23<sup>rd</sup> September 2024 visit [esa-star Publication](https://esastar-publication.sso.esa.int) and search for this opportunity to download the official competition documents.  
<https://esastar-publication.sso.esa.int>
3. Use the official documents to prepare your proposal
4. Contact details of each National Delegate can be found here:  
<https://business.esa.int/national-delegations-0>
5. Submit your proposal via [esa-star Tendering](https://esastar.sso.esa.int) by the 3<sup>rd</sup> of November 2024.  
<https://esastar.sso.esa.int>

Opening dates: 23<sup>rd</sup> September – 3<sup>rd</sup> November 2024



# Space for Sustainable Pharma: about the Kick-Start Activity



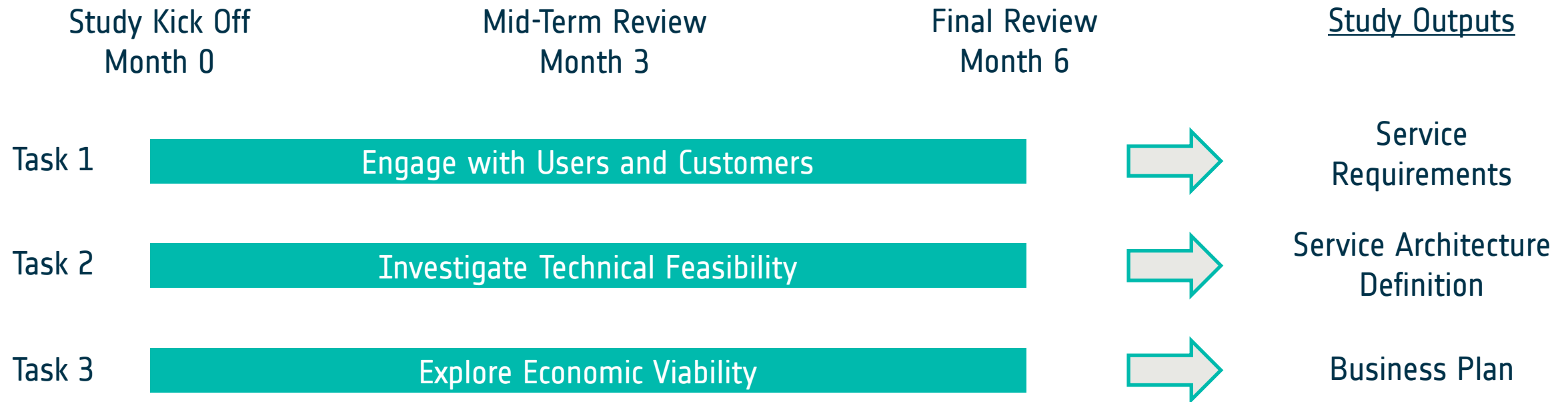
Winners of the competition will run a **6-month study** to investigate the **technical feasibility** and **commercial viability** of their idea.

Kick-Start activities are funded at 75% by the European Space Agency for a maximum of €75K per contract.

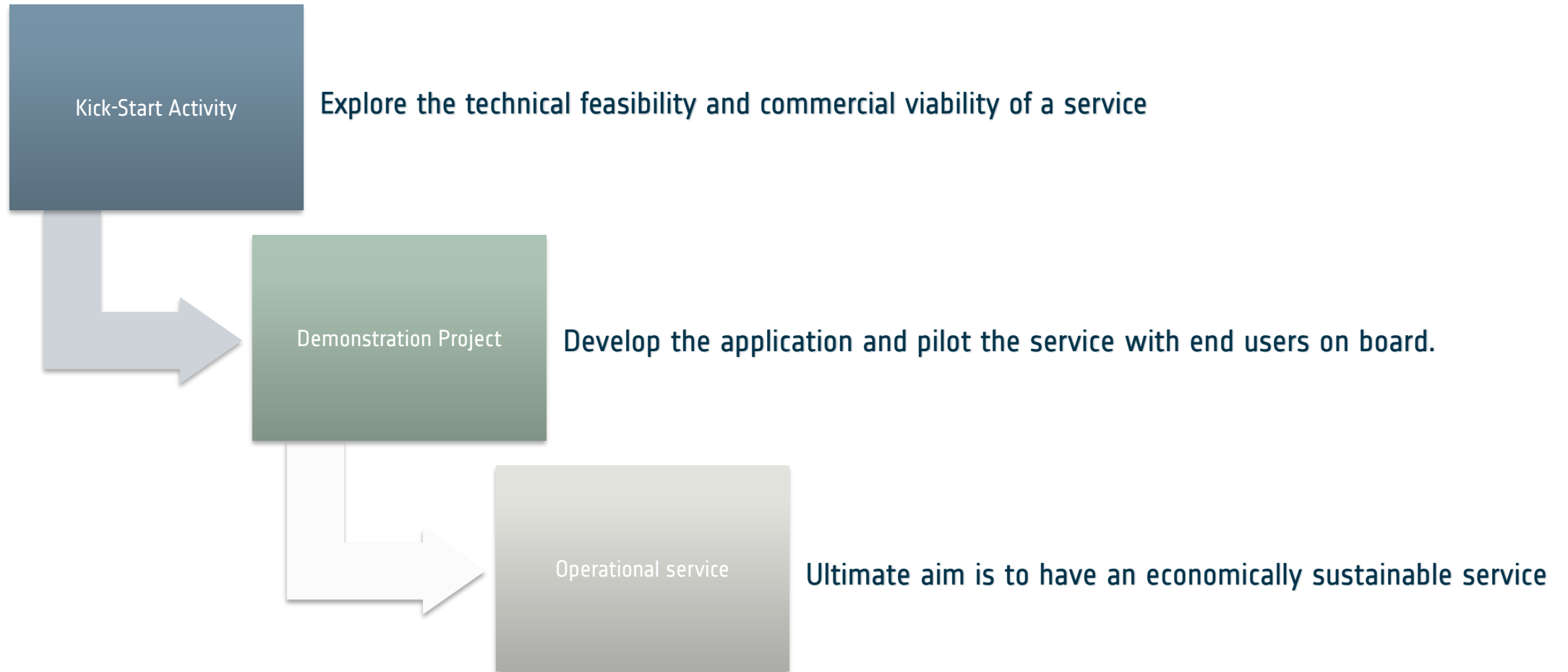
After the study there is the opportunity for **further funding** and support from ESA.

Visit: [Space for Sustainable Pharma \(esa.int\)](https://esa.int)





# Overall Aim of the Kick-Start Activity



Thank you for your attention:  
Q&A

Opening Date: 23<sup>rd</sup> of September 2024

Closing Date: 3<sup>rd</sup> of November 2024

Click here and visit  
[Space for Sustainable Pharma \(esa.int\)](https://esa.int)





TOWARDS A

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ECONOMY

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Space applications for competitive, sustainable economies and resilient societies

