Connected Agriculture

ESA BASS Kick Start

24th May 2023

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ESA – TIA/API

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Agenda

- ESA Business Applications

- Connected Agriculture Kickstart

- How to apply

European Space Agency

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**

Space Weather

Earth Observation

Satellite Navigation

Satellite Communication

Human Spaceflight Technologies

Maritime

Healthcare

Transport

Environment

Agriculture

Media

Energy

Education

Aviation

Financial

BASS Objectives

- To advance the growth and global competitiveness of the space downstream and new space industries of the Participating States;

- To explore a wider combination of space techniques, tools and technologies, possibly together with terrestrial systems, multiplying the range of space-dependent services and products that can be delivered to customers;

- To attract a wider range of actors into the end-to-end space value chain, able to generate innovative services and products that will be sustained through private investment and user funding sources;

- To attract a wider range of users of services based on space technology, especially in sectors of major economic importance;

- To attract actors starting new businesses implementing space technologies in innovative ways; and

- To promote the emergence of space-based sustainable services addressing: societal challenges, UN Sustainable Development Goals and the green transition

Desired Outcomes

SOCIO-ECONOMIC

Social, green value and economic sustainability

SPACE USE

Utilisation of space in new markets and user communities

INDUSTRY COMPETITIVENESS

European Industry competitiveness on global space and non-space markets

Sustainability elements of space applications

PEOPLE
Social value

PLANET
Green value

PROFIT
Commercial value

ARTES BASS:
>75% SMEs
>33% Newcomers

Creating Green Value

Sustainable Tourism
€2.1 = 1%

Green Finance
€4.3 = 3%

Energy Transition
€30.6 = 20%

Protecting Ecosystems
€36 = 24%

Circular Economy
€2.7 = 2%

ARTES

Clean Water
€8.7 = 6%

Sustainable Mobility
€35.1 = 23%

Sustainable Food Production
€25.5 = 17%

GREEN INITIATIVE
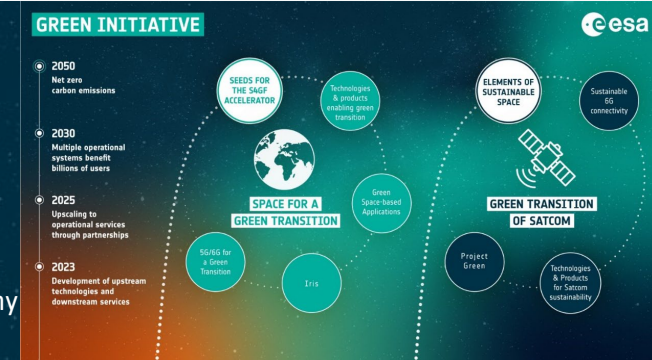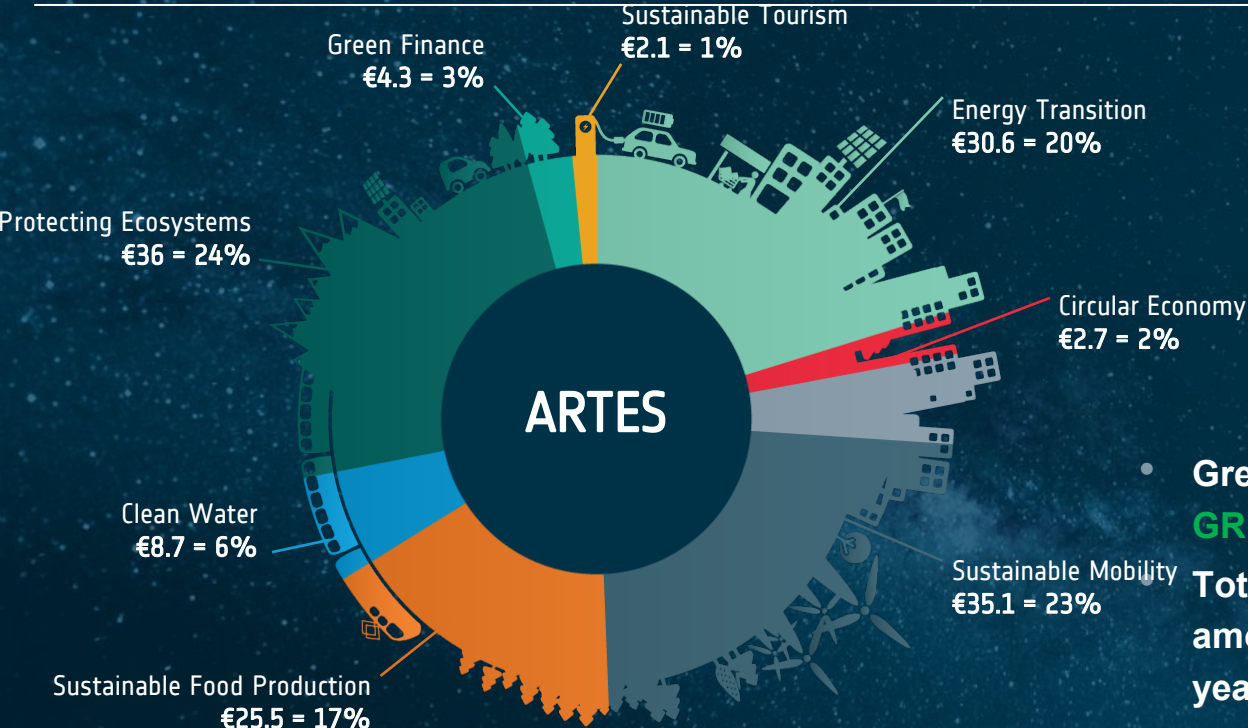
- **Green Dossier 2nd edition. Twice as GREEN**
- **Total investment from NDs and Industry amounts to 150 MEUR over the past 12 years**
- **€70M in 139 new activities in just 2 years**
- **Contributing to the S4GF Accelerator**

Creating Social value and inclusiveness

Innovation and digital economy
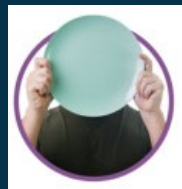
Education and reskilling
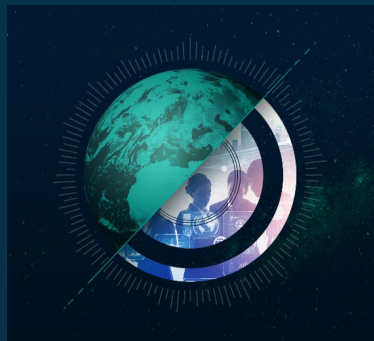
Sport and Well-being

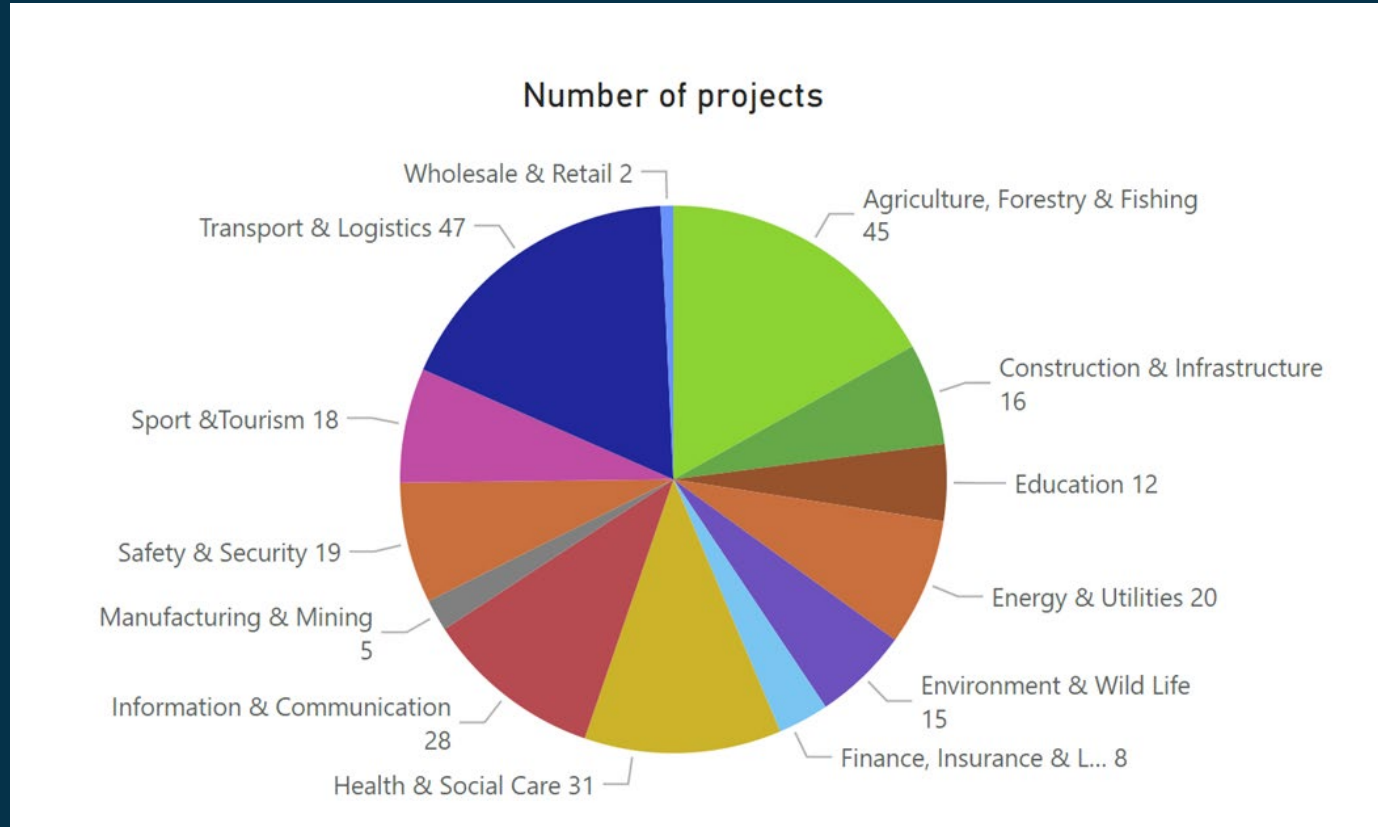Inclusive growth
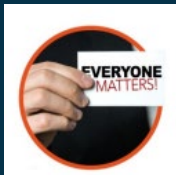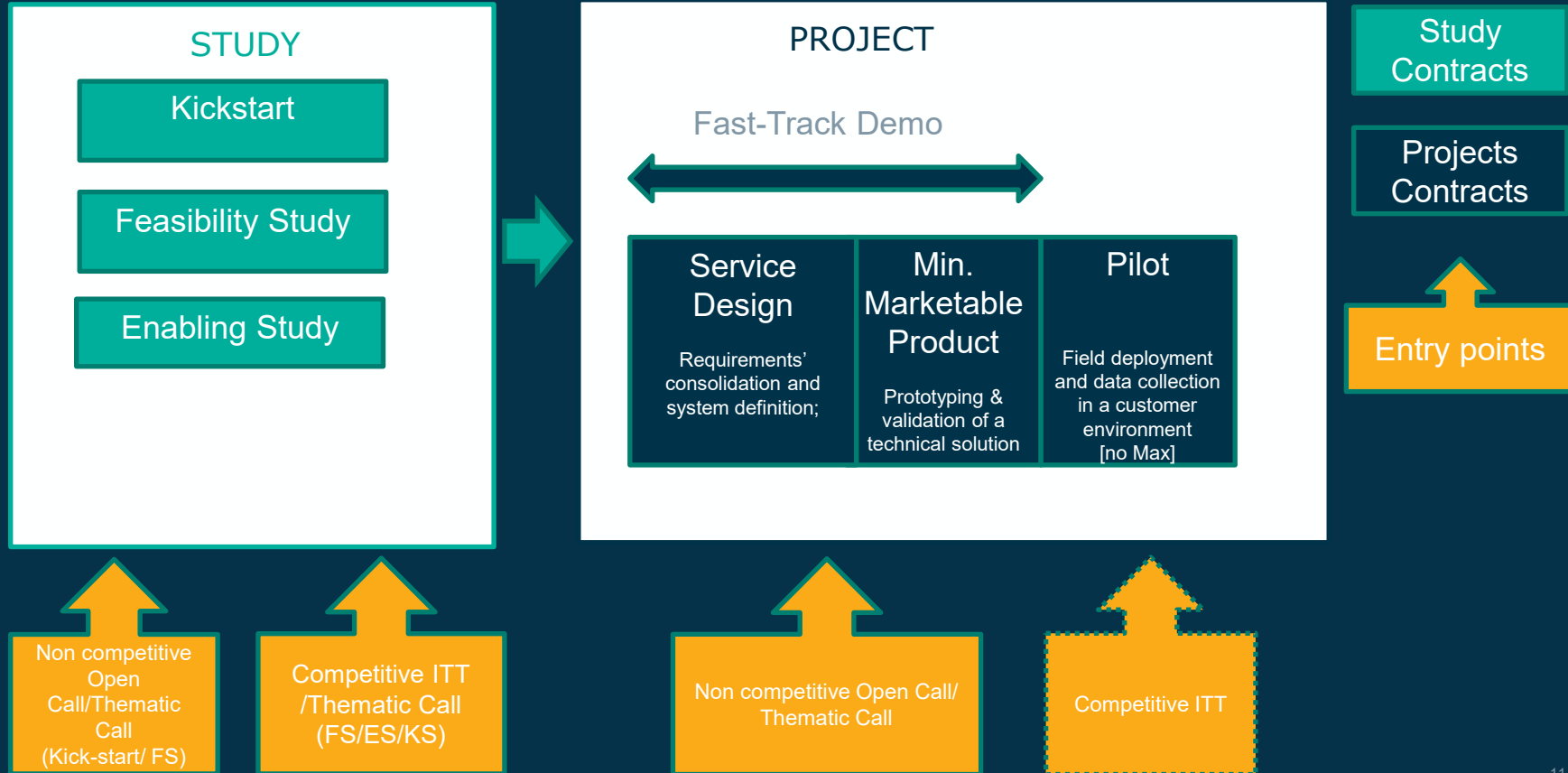
Food security

Culture

Health

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A wide range of users and markets

Number of projects

- Wholesale & Retail 2
- Transport & Logistics 47
- Sport & Tourism 18
- Safety & Security 19
- Manufacturing & Mining 5
- Information & Communication 28
- Health & Social Care 31
- Finance, Insurance & L... 8
- Environment & Wild Life 15
- Energy & Utilities 20
- Education 12
- Construction & Infrastructure 16
- Agriculture, Forestry & Fishing 45

Implementation approach

STUDY

Kickstart

Feasibility Study

Enabling Study

PROJECT

Fast-Track Demo

Service Design
Requirements' consolidation and system definition;

Min. Marketable Product
Prototyping & validation of a technical solution

Pilot
Field deployment and data collection in a customer environment [no Max]

Study Contracts

Projects Contracts

Entry points

Non competitive Open Call/Thematic Call (Kick-start/ FS)

Competitive ITT /Thematic Call (FS/ES/KS)

Non competitive Open Call/ Thematic Call

Competitive ITT

→ THE EUROPEAN SPACE AGENCY

About the Competition

- Winning teams will investigate the technical feasibility and commercial viability of their idea for 6 months.

- Each selected kickstart study will be funded at 75% by the European Space Agency for a maximum of €60K. The remaining part will be covered by the team.

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

- Opening dates to submit your proposal : 1 June -> 31 August 2023

The big picture

- **Agriculture and food access** is a basic human need and a critical infrastructure

- **Agriculture current state:** heavily oriented towards intensive agriculture with huge impacts of the environment, biodiversity and people life

- **Global challenges:** growing world population, climate change, water scarcity, political disruptions, inefficient supply chains

Kritische Infrastruktur Landwirtschaft

Die Absicherung einer ausreichenden Versorgung der Bevölkerung mit Nahrungsmitteln ist ein wesentlicher Bestandteil der staatlichen Daseinsvorsorge. Dies gilt insbesondere auch dann, wenn auf Grund von Versorgungsstörungen das gewohnte, reichhaltige Angebot an Nahrungsmitteln nicht mehr zur Verfügung steht.

What can connected agriculture do ?

- **Grasp the power of digitalization:** many sectors have been "transformed by the Internet". Agriculture sector would benefit greatly: increased productivity, social and environmental benefits

- **Support rural communities:** increasing access to broadband internet connection means increasing access to knowledge, higher life quality and social inclusion

- **Support new practices:** precision farming, reducing inputs, circular economy, biological farming, mixed crops, agro-forestry, carbon sequestration, …

- **Preserve the environment:** revitalize soils, protect water reserves and biodiversity

	Next generation farm management systems	• Integrated solutions : all in one, interoperable, data transparency, mobile • Online : access to latest services, able to upload and download larger contents (maps, UAVs data)
	Smart livestock and stable monitoring	• Manage and monitor livestock environmental impacts, animal welfare and quality • Cattle location tracking, automation • Stables remote monitoring
	Precision farming and automation	• Variable rate application of fertilizers and herbicides • Smart irrigation • Automation of labour intensive and harmful tasks in a closed and securable environment
	Farm machinery maintenance management	• Predictive maintenance of essential machinery • Adhoc Remote assistance

SPACE SOLUTIONS

European Space Agency

Satellite Communications:
- broadband connectivity for farms with no, limited or expensive terrestrial Internet access
- manage farming robots as primary or redundant communication means
- UAVs in Beyond Visual Line of Sight (BVLOS) scenarios.
- Satellite Internet of Things (S-IoT) for affordable and efficient data transfer and position augmentation techniques for guiding tractors and machines
- collecting data from in-situ field sensors (e.g. soil salinity, moisture, local rain).

Satellite Navigation:
- Precise navigation for farming machines
- Precise navigation for autonomous or semi-autonomous machines
- Fleet management and livestock management

Satellite Earth Observation:
- Management of sustainable farming practices (e.g. carbon sequestration, organic farming)
- New techniques emerging (e.g. SAR to monitor biomass)
- Monitoring of pollution levels that may be caused or affect the sector

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INNOspace® Network Space2Agriculture

Challenges: global – European – national

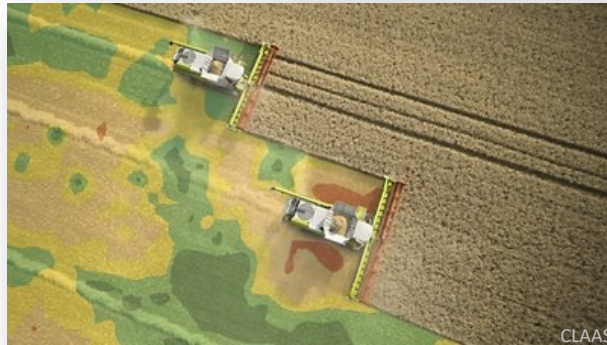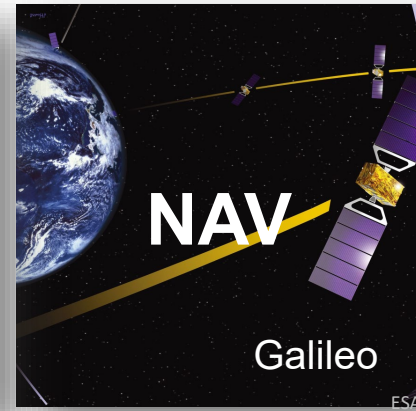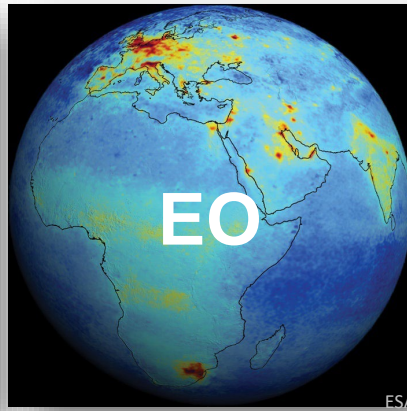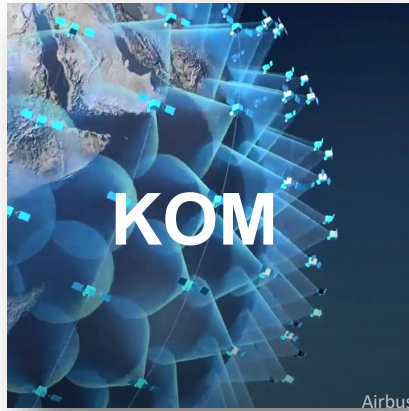- ensuring food security for a growing world population
- climate change (mitigation & adaption)
- soil degradation & water scarcity
- loss of biodiversity & tree cover
- **digital transformation**

Goals of Space2Agriculture

- bringing space and agricultural players together
- **transferring knowledge and technology to address agricultural and environmental challenges**
- initiating joint R&D projects and business relations
- leveraging synergies
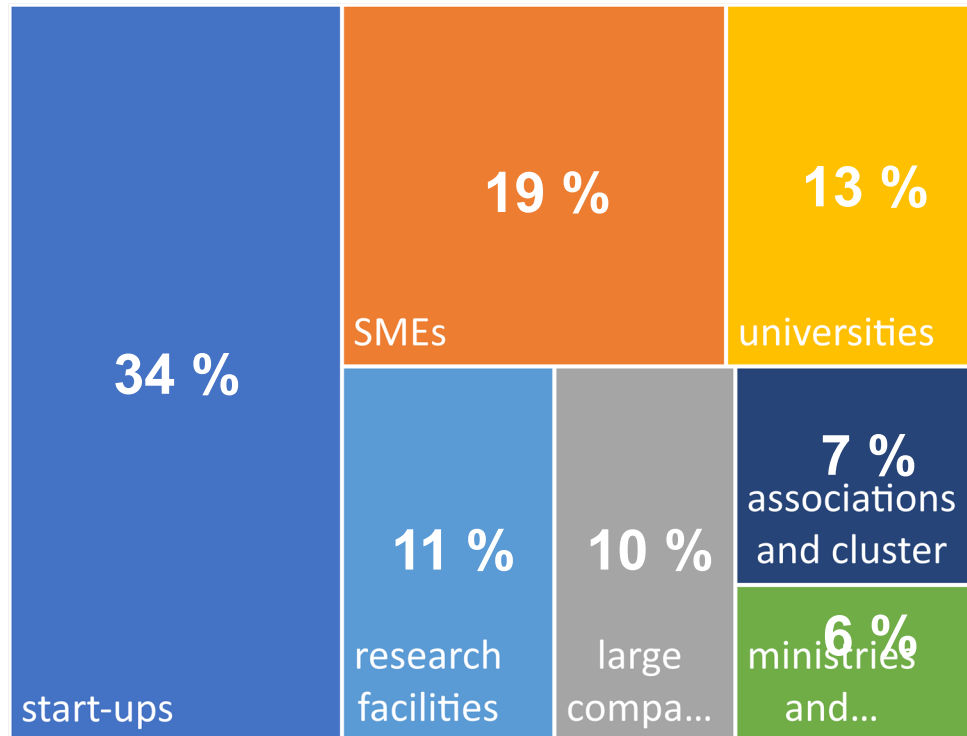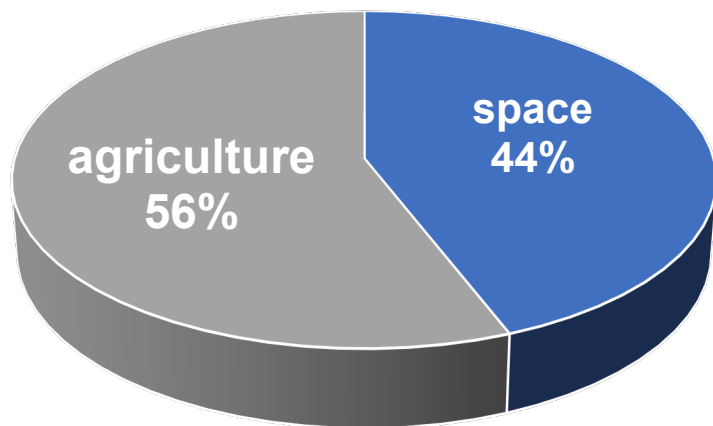- presenting space technologies, projects and services

German Space Agency at DLR

European Space Agency

Using space technologies and services
to support the digital future of agriculture

KOM

EO

NAV

Galileo

European Space Agency

founded in 2019
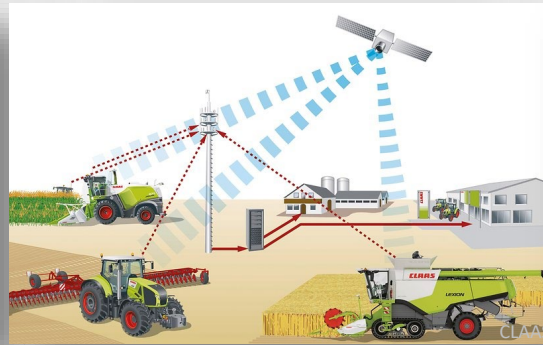
Facts and figures

- **250+ official members**

- **slightly more partners from agriculture**

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Main working groups in Space2Agriculture

Space infrastructures for the digital transformation of agriculture and forestry

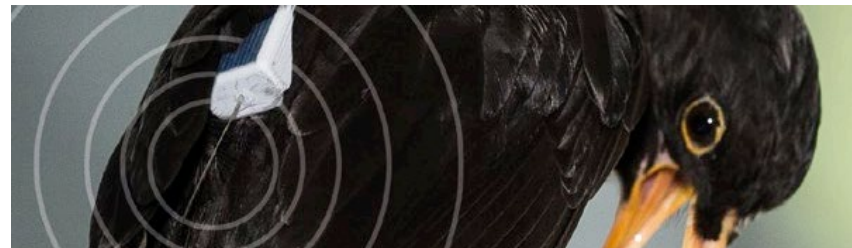**Technology transfer between space and agriculture (spin-offs und spin-ins)**

Space technologies for agriculture in the context of climate change and food security

Space technologies to support the restoration of biodiversity and sustainable agriculture

Working Group 1:

Space infrastructures for the digital transformation of agriculture and forestry
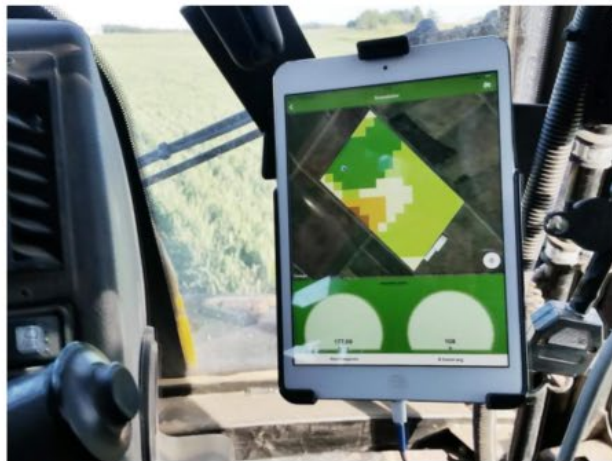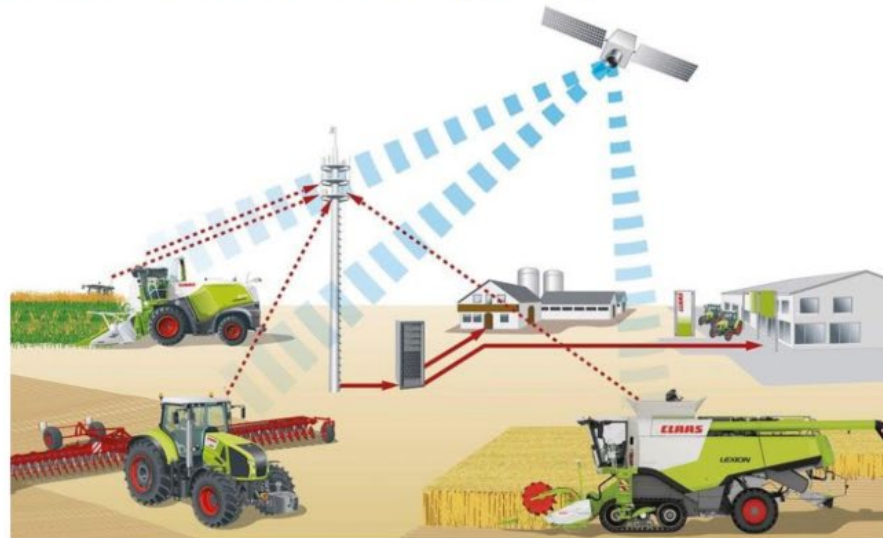
© ESA

JOHN DEERE

NEWS RELEASE SEPTEMBER 29, 2022

John Deere Announces Request for Proposals for Satellite Communications Opportunity

© Solorrow

© CLAAS Group

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the digital transformation of agriculture

Satellite Communication

- Technology and capacity is available
- Strong need in the market
- BUT: no viable offer, no (European) business model
- Almost no examples of the use of satellite communication
- Interviews with Experimental Fields → There definitively is a problem with connectivity
- lack of a reliable broadband connection is one of the biggest problems for the digitization of agriculture

BeSt-SH
AgriSens-DEMMIN 4.0
DigiSchwein
Agro-Nordwest
FarmerSpace
EXPRESS
Landnetz
CattleHub
DIWAKOPTER
EF-Suedwest
DigiVine
Diabek
DiWenkLa
DigiMilch

bmel.de

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Connectivity: A necessary infrastructure to build on

High-Tech

- Precision farming
- RTK-signals
- drones, robots
- autonomous land machines: machine to machine communications
- remote maintenance and support via augmented reality
- …

Daily Life – "normal" demand of connectivity

- Reliable internet connection for "Farm Management Systems": in areas where the farm has no or an unreliable broadband connection, the use of farm management systems is a problem
- Barn Monitoring: where there is a high level of automation in pig and cattle farming, reliable connectivity is a necessity
- Filling online forms of authorities: How to do without reliable internet?
- Life quality / digital participation in rural areas

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Thank you
for your attention!

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How to apply?

Funding schemes BASS

Entry point	Type of activity	Total cost/price of activity & funding
Direct Negotiation	Feasibility studies	Max 500k Eur, 50-80% funded by ESA (can be 100% for research contributions)
	Demonstration projects	No max amount, 50-80% funded by ESA (depending of wishes of the delegation)
Invitation to Tender (Open competition)	Feasibility studies	Max 200k Eur, 50-100% funded by ESA
	Kick-Starts	60k price for ESA, 75% funded by ESA

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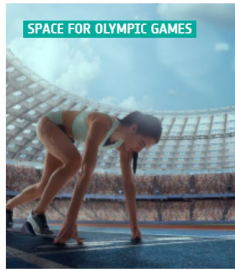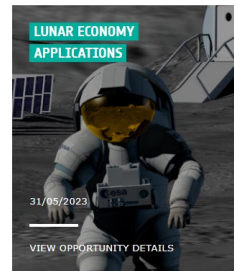
Where to find the information

business.esa.int

- Scroll down to the part "Featured Opportunities" to see all activities currently open or in preparation

The Connected Agriculture KS call information will appear there

ELIGIBILITY

Funded participation to Connected Agriculture Call for Kick starts is open to any company and/or organisation residing in the following Member States:

- **Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden and the United Kingdom.**

- **Germany and Luxembourg** have pre-authorized the funding to this call.