

APNorway Inauguration Workshop - ESA's ARTES Applications Programme

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Trondheim
27/05/2014**

European Space Agency Programmes



All Member States participate (on a GNP basis) in activities related to space science and a common set of programmes (**Mandatory** programmes).

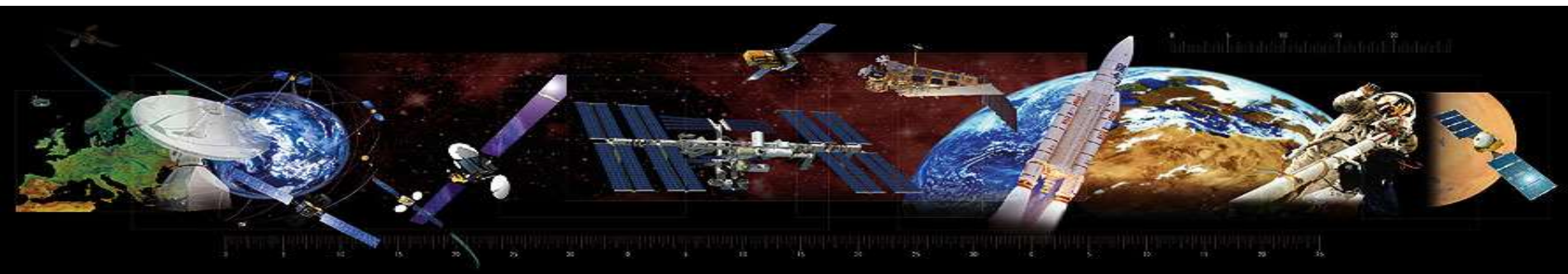
Mandatory

- General Budget: Future studies, technological research, education, common investments (facilities, laboratories, basic infrastructure)
- Science: Solar System science, astronomy and fundamental physics

In addition, Member States choose their level of participation in **Optional** programmes.

Optional

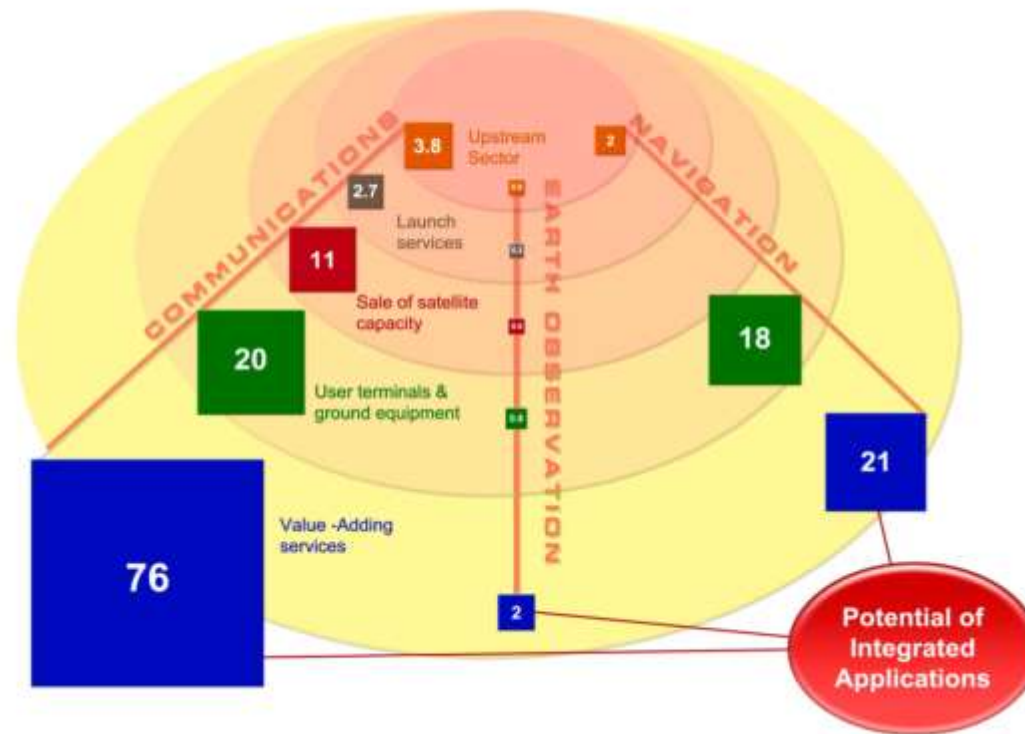
- Human Spaceflight
- **Telecommunications & Integrated Applications**
- Earth Observation
- Launchers
- Navigation
- Robotic Exploration
- Space Situational Awareness



1. General Objectives of the “Advanced Research in Telecommunications Systems” (**ARTES**) Programme:
 - a. Maintain and improve the **capability and competitiveness** of industry of participating countries in the world satellite satcom market.
 - b. Develop satellite-based solutions that **meet the needs** of European Society and European Institutions.

2. ARTES is a «**frame**» programme which hosts different Elements. Each of these Elements has a set of specific objectives and conditions (e.g. funding level, tender conditions).

The Three Value Chains in Commercial Satellite Applications: Global Space Market Revenue in US\$Bn



1. **Sat communications** are dominant with **>75%** of the downstream services revenue
2. **Navigation** is emerging **21%**
3. **EO** is currently **2%**

Source: Euroconsult & GSA, 2010

Background:

- Programme running since 2008.

Achievements to date:

- About 200 activities covering a wide range of thematic areas.
- Has already led to number of operational or pre-operational services.
- Supporting commercial spin-offs for companies such as Robin Radar Systems and SatADSL.

ARTES 20 – Integrated Applications Promotion (IAP) programme



Key objectives:

- Actively engage with users to build sustainable solutions to meet their needs.
- Develop commercially sustainable services for new user groups.
- Integrate multiple space assets (satellite communication, satellite navigation, Earth Observation, Human Space Flight) and terrestrial assets.

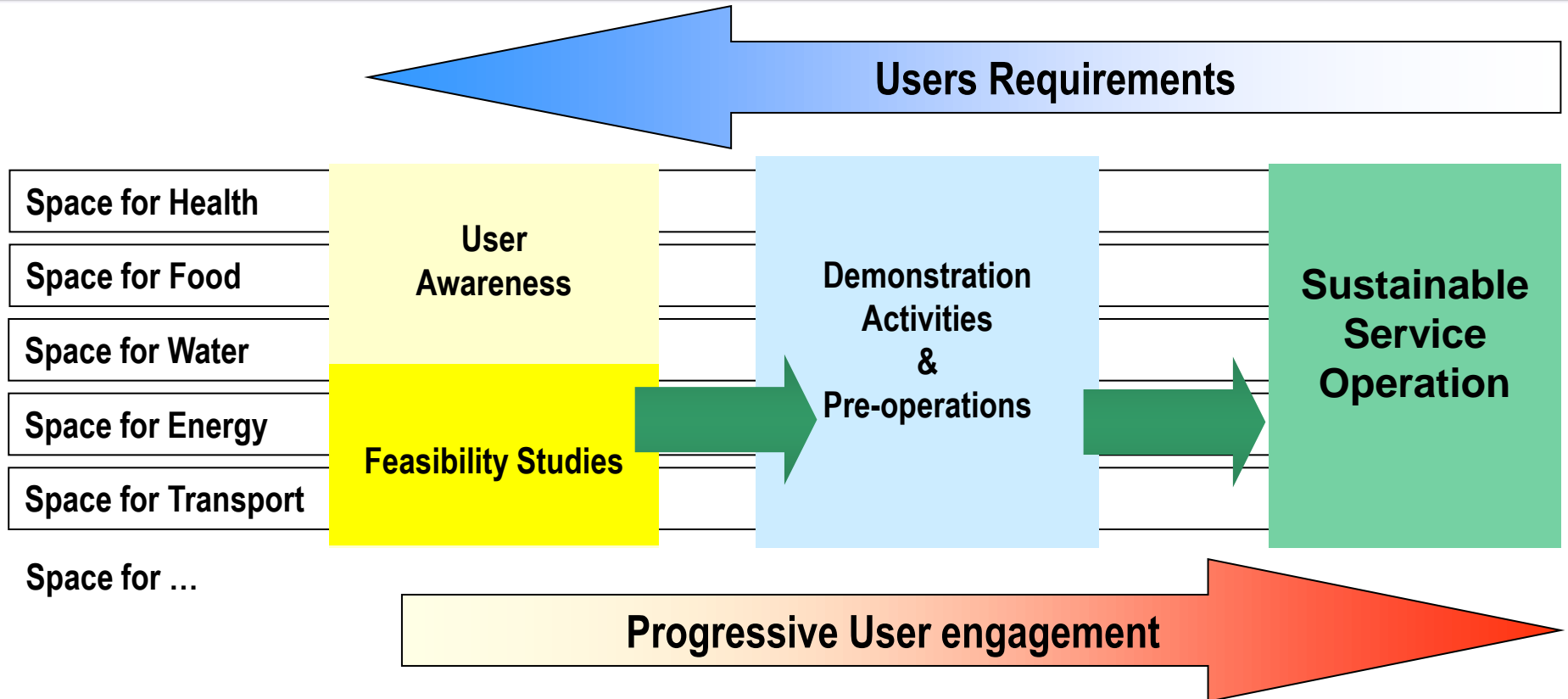
ARTES 20 Continuously Open Call for proposals:

- See <http://artes-apps.esa.int> and EMITS ITT AO6124.
- Funding 50% (up to 100% possible for universities & research institutions in feasibility studies).

ARTES 20 Open Competitions:

- See <http://artes-apps.esa.int> and EMITS.
- Funding 100%.

IAP Programme Structure



Awareness Activities: Understand, foster and organise stakeholder demands.

Feasibility Studies: Assess technical and economic viability of services.

Demonstration Projects: Implement pre-operational services in partnership with users.

1. A network of IAP Ambassador Platforms across Europe.
2. A web portal gateway to IAP <http://artes-apps.esa.int> with noticeboards, Beginners Guide, Outline Proposal templates (Feasibility & Demo), Showcases, Upcoming events, etc.
3. Calls for User Ideas / Calls for Ideas.
4. IAP Prize.
5. User Workshops.
6. PR Material, e.g. brochures, ARTES Applications video.

Integrated Application Promotion Ambassador Platforms (APs)



Key roles of an Ambassador Platform:

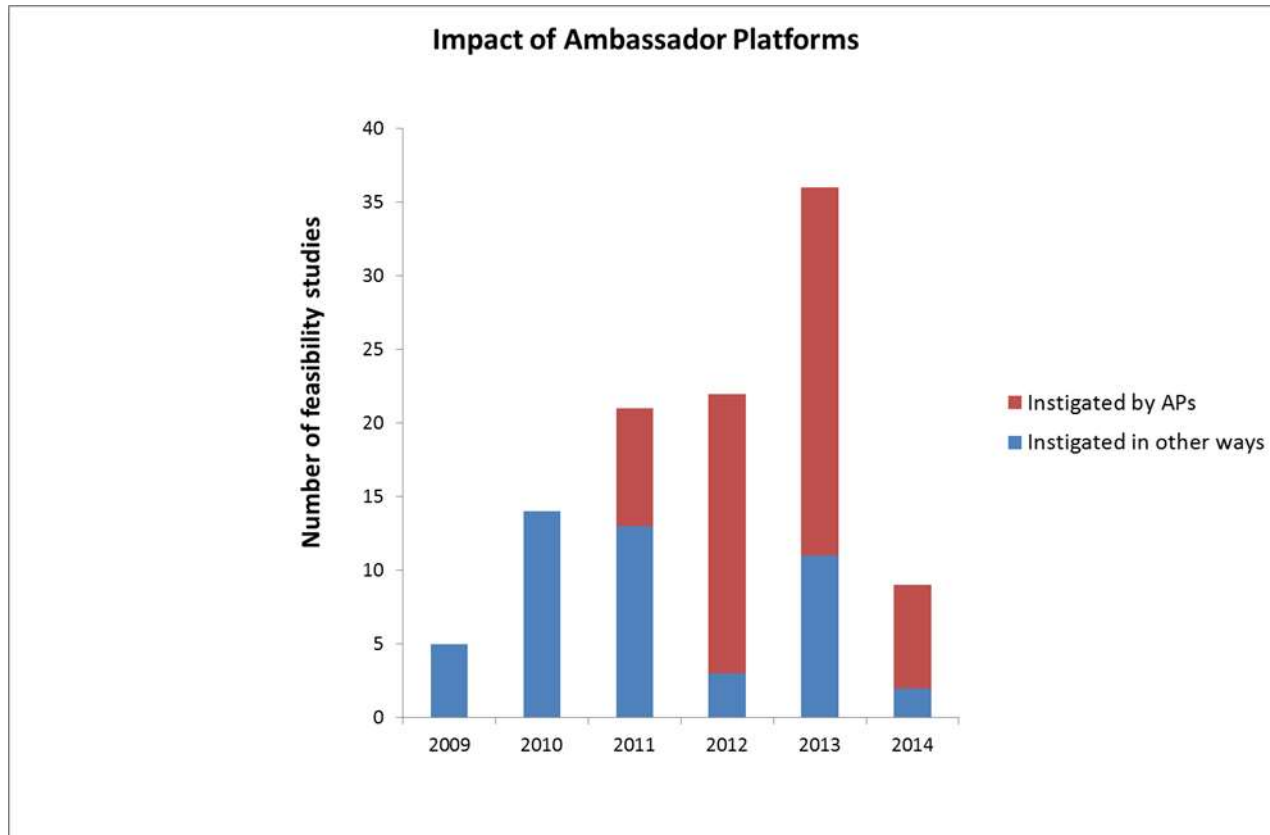
- a. Spread and increase awareness of Space Applications to Users to federate User demand (generate “critical mass”).
- b. Local Presence and Domain expertise.
- c. Act as an “honest broker” between ESA, industry and user community.
- d. Prepare and run workshops (with ESA support).

-> Motivate and support stakeholders to submit viable proposals.

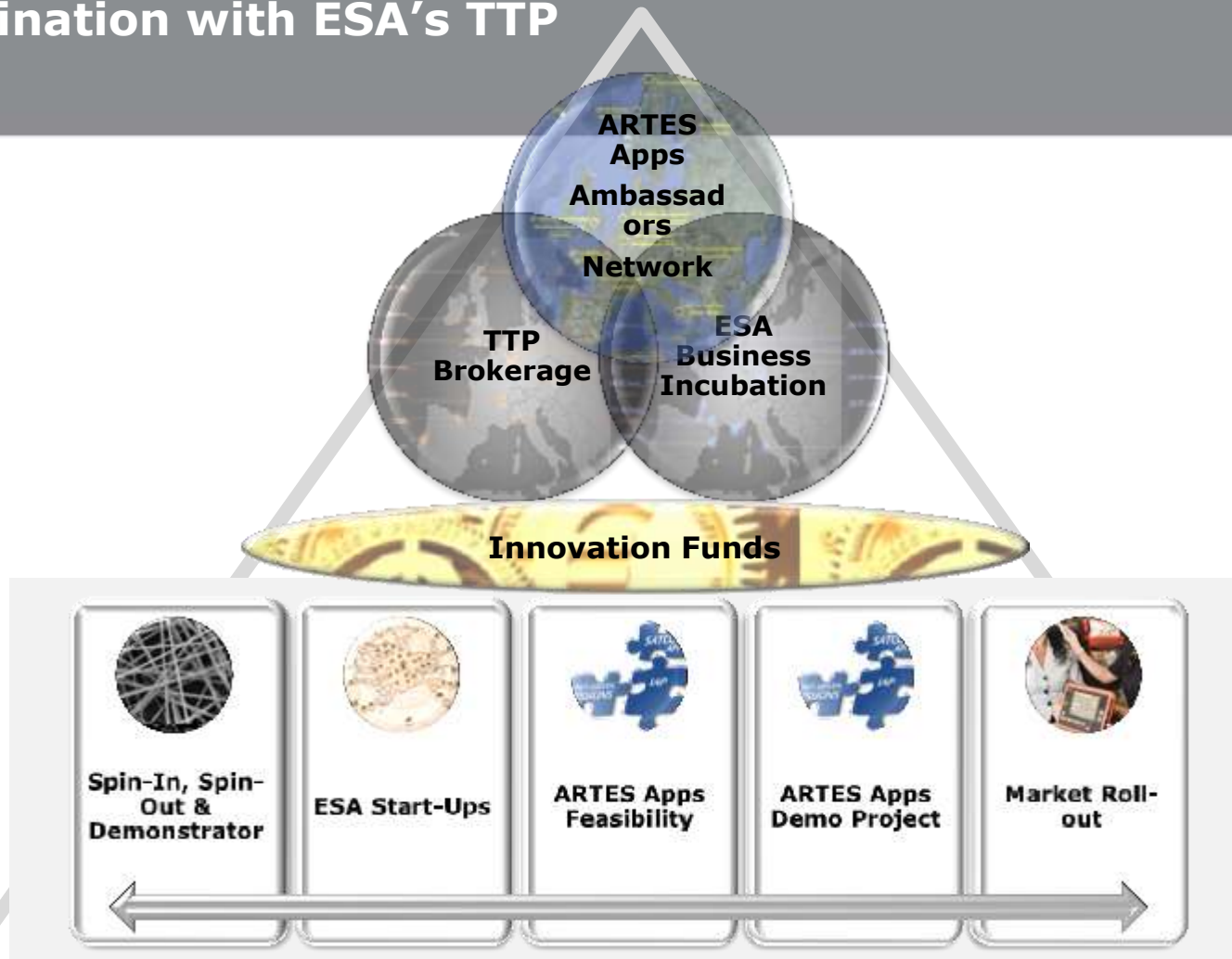
Network of IAP Ambassador Platforms



Number of IAP Feasibility Studies instigated by APs in the period 2009 to 2014



Coordination with ESA's TTP



Horizon 2020, other national programmes and ESA directorates activities are coordinated through intensive collaboration with DG-ENTR, Inter-directorate Application Group and, national/regional entities contacts

ARTES Applications portal – artes-apps.esa.int



EUROPEAN SPACE AGENCY TELECOM

LOG OUT USER ACCOUNT

artes applications



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→ 4th ARTES APPLICATIONS WORKSHOP



29–30 April 2014

Chamber of Commerce
Luxembourg

→ REGISTER ONLINE NOW

Search



Space for daily life brochure (pdf)



ARTES brochure (pdf)



Welcome to ECSAT

LATEST NEWS AND EVENTS



Industry Day On Joint ESA-EDA Demonstration Project DESIRE II
ESA and the European Defence Agency (EDA) are pleased to announce an informative Industry Day for the **21st of March** on the second element of the "Demonstration of the use of Satellites complementing Remotely Piloted Aircraft Systems integrated in non-segregated airspace (DESIRE II)", whose tendering release under the ESA procurement rules is imminent.

EVENT CALENDAR

MARCH						
M	T	W	T	F	S	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

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News, Funding Schemes,
Proposal Guide, Event
Calendar

OPPORTUNITIES

Open Competitions, Call for
Proposals, Call for Ideas

PROJECTS

Success Stories, Latest
Projects, Project Filters

COMMUNITY PORTAL

Ambassador Platforms,
Discussion Forums



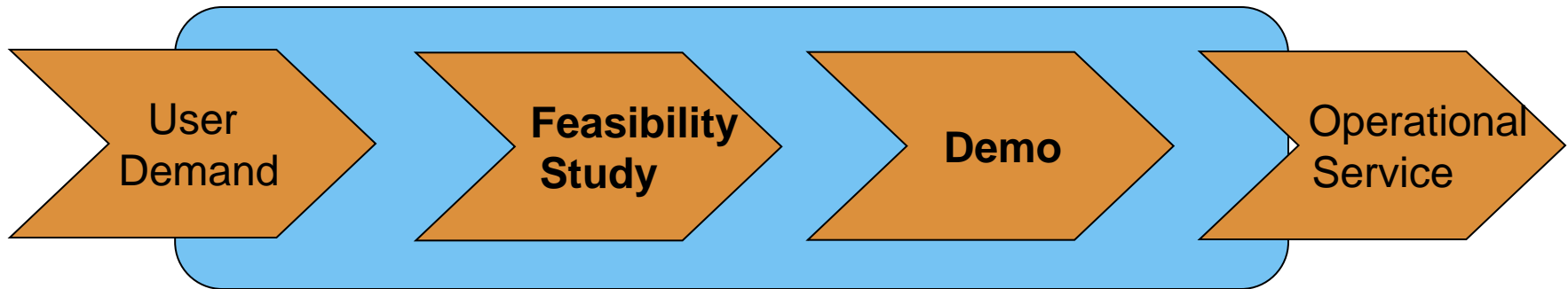
ONE SINGLE GATEWAY
for all ARTES Applications
programmes

European Space Agency

ESA's Integrated Applications Promotion Programme (ARTES 20)



ESA IAP Involvement



User with demand but no contact to industry

Contact with ESA:

- artes-apps.esa.int
- Conferences
- Ambassadors
- Call for User Ideas

Funding by ESA:

- 100% - ESA initiated activities in close collaboration with users / stakeholders
- 50% * - Partner / industry initiated activities in close collaboration with users / stakeholders

Funding by ESA:

- 50% - initiated by ESA or industry

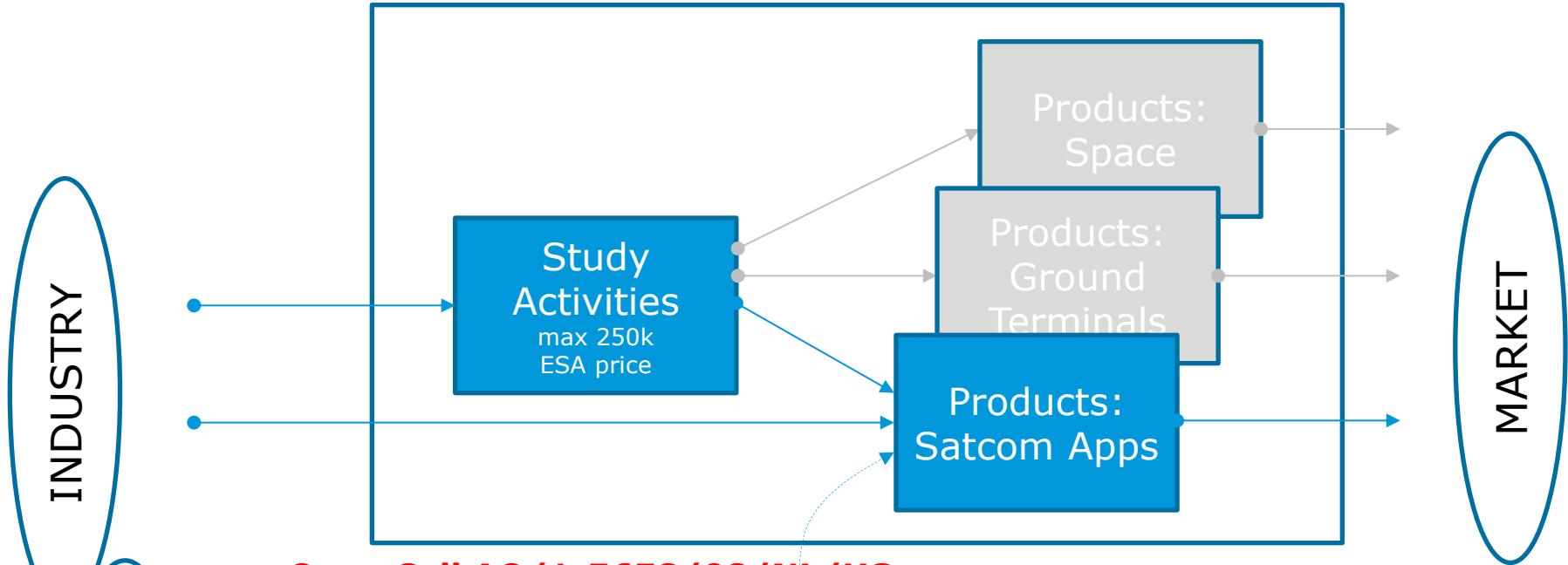
Support, etc

* For Feasibility Studies only: Work carried out by Universities and research institutes and justifying no further commercial interest in the final solution may be funded 100% by the Agency.

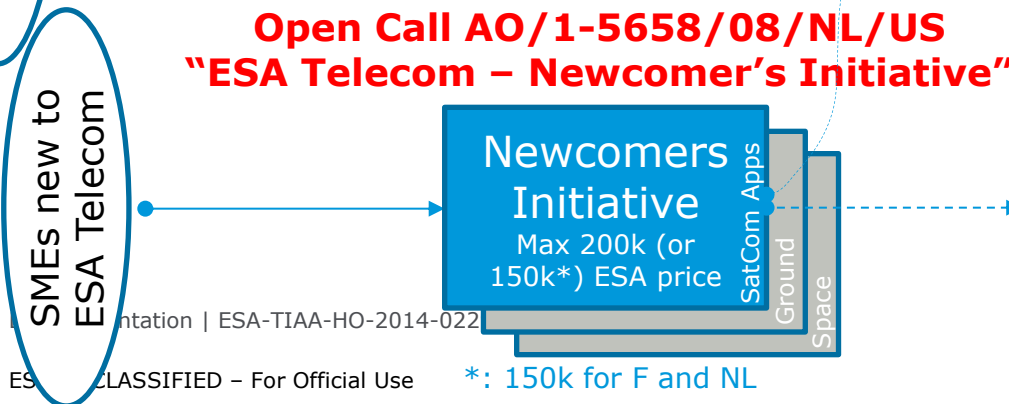
ARTES 3-4 – Commercial Satcom Applications



Open Call AO/1-5891/08/NL/US ARTES 3-4 "Telecom - Products Programme"



Open Call AO/1-5658/08/NL/US "ESA Telecom – Newcomer's Initiative"



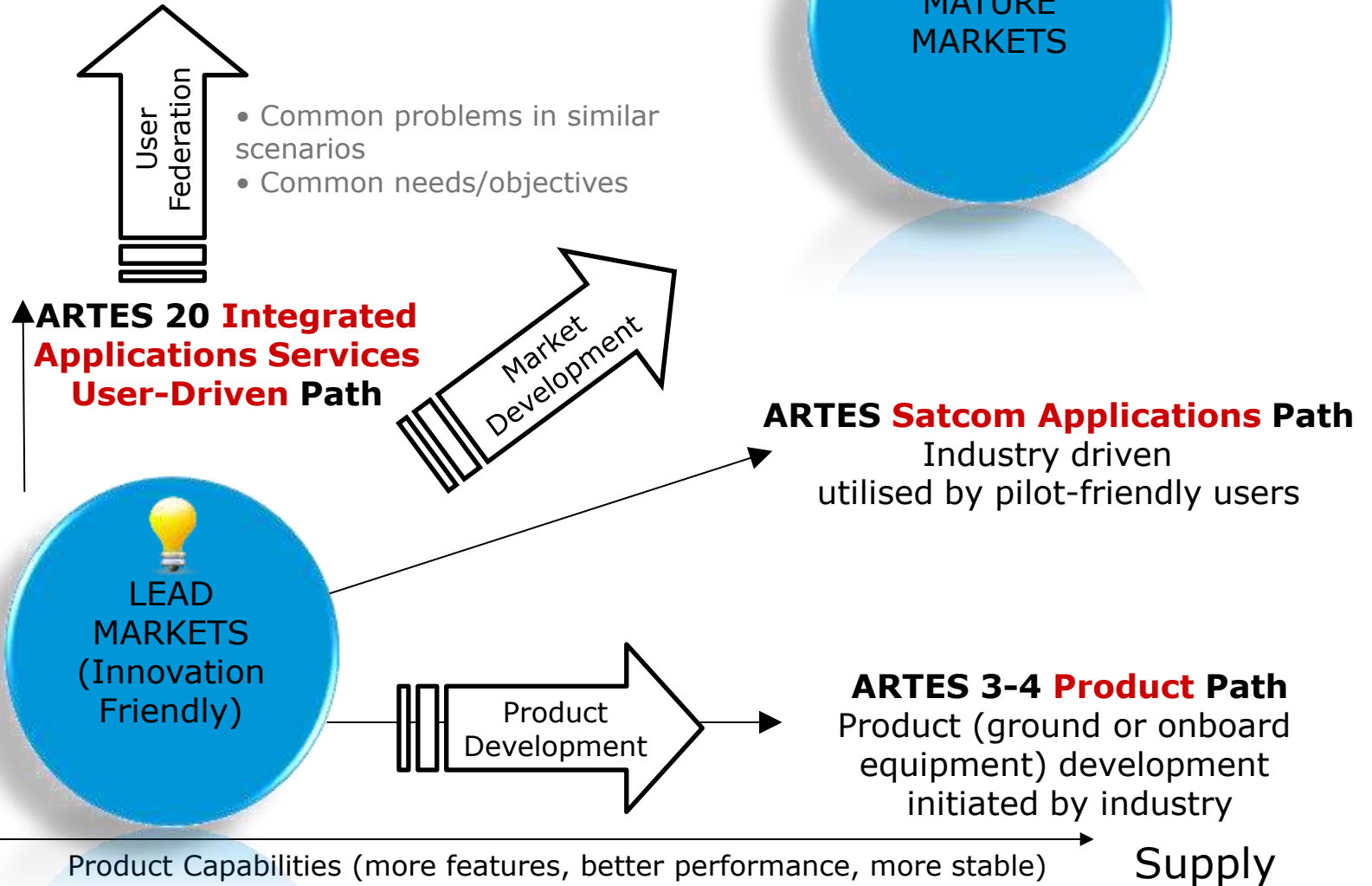
For all activities: ESA contribution can be up to 50% of the project costs

ESA applications programme approach to development



Demand

(Customers willingness to adopt/buy the product/service)



SatCom Operator Opportunities



ARTES projects can exploit, where applicable:

- Free or discounted access to satellite capacity for the duration of the project activities;
- Access to technical, operational and commercial information to make the best technical and business choices;
- Support from the satellite operator during the preparation of the proposal and the execution of the project.

The following agreements have been so far set up between ESA and satellite operators:

Satellite Operator	Satellite	Band	Products Offered
SES Broadband	ASTRA 3B & 4A	Ku-band	SES Broadband services at special conditions to the project
Avanti	HYLAS 1	Ku-and Ka-band	Pure bandwidth, Hosted Network Operation, Guaranteed Virtual Network Operation, Shared Virtual Network Operation at no cost to the project

ESA expects all applicants to ARTES Applications programmes to...



- **Identify the user community and the needs/demands** that could trigger a new sustainable service.
- **Identify the gaps** that prevent the users to do their job optimally or to expand ... maybe there is a chance for space systems to fill the gaps.
- **Come to us** with their idea and **we discuss together** if and where space can help, **identifying the best route** through the system of ESA programmes (SatCom, Integrated Applications, others).
- Get in **contact with their national ESA delegation**, as they are the ones needed to support the activity as well.
- Be aware that there is a **requirement for co-funding** for both industries and user groups.

Points to pay special attention to ...



- The involvement of the **stakeholders / users** in most of the tasks is indispensable: it needs to be explained how this involvement is done. (ARTES 20)
- Experience and **completeness of the team**: it needs to be explained which know-how is already in the team, but also which know-how is missing and how this will be acquired (training, new partner, external service, advisor, etc).
- The identification / involvement of a potential **service provider** is highly recommended for FS and indispensable for DP (ideal case: the service provider is the prime).
- The **viability analysis** is often done by technical persons which is often inappropriate, as they do not have the know-how. (ARTES 20)
- The coordination with the **national delegations** related to the consortium partners has to be established from the very beginning, as their approval procedures to issue the required authorisation letters need time as well.

- **Strong user needs, interest & involvement.** (ARTES 20)
- Include the **utilisation of two or more space assets.** (ARTES 20)
- Provide evidence of **clear added value** (w.r.t. state of the art of the service, and of including the space component).
- Demonstrate **potential for sustainability.**
- Proven **strength in background and experience** (credibility) of the bidding team with respect to the proposed activity.
- And only for Demonstration Projects:
Demonstrate the need for and the representativeness of the pre-operational service (incl. scalability).

- **User / Customer:**
 - Representing / leading broader markets (champion).
 - Open to new solutions.
 - Willingness to pay for the service.
- **Service Provider:**
 - Familiar with the market (already in the market).
 - Provider of operational services (24/7).
- **Technology Provider(s):**
 - Various technologies to address the specific user demand.
- **Industrial team:**
 - Strong leadership and good management.
 - Systems Integration + technical know-how + commercial expertise.

ARTES Application Activities Outline Proposal Development Tool



artes applications



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- National Delegations
- Newsletter
- Register
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OUTLINE PROPOSAL DEVELOPMENT TOOL FOR ARTES APPLICATIONS

19 February 2014 - Last updated at 04 March 2014 - 10:30

To apply to the ARTES Applications programmes, it is mandatory that bidders submit an Outline Proposal before submitting a Full Proposal as a means for the bidder to initiate a dialogue with the ESA ARTES Applications Programme Office on the content of the planned activity. This approach allows for clarification of the eligibility of the proposed idea, as well as allowing for early feedback on the content of the technical and business parts before the bidder starts preparation of the Full Proposal.

The Outline Proposal needs to provide the following information:

1. System/Service Overview
2. Major Project Stakeholders
3. Service Value Chain
4. Competitive Positioning
5. Market Analysis
6. Financial Indicators
7. User Requirements
8. System/Service Architecture
9. Implementation Approach
10. Pilot Service
11. Finance, Management & Administrative (FMA)

The Outline Proposal Development Tool has been designed to help preparing these topics. There are specific tools and templates for each topic, along with step-by-step guidance on how to write each section of the Outline Proposal. Eleven modules assist the proposal author by addressing a specific section of the Outline Proposal document. Inside each module can be found tutorials, tools, worksheets, tips and techniques for preparing the Outline Proposal.

Bidders are encouraged to work through each module to gain maximum value, but may also select only those modules of specific interest.

The Outline Proposal Development Tool is online on the ESA Telecom website, and is accessible via the URLs:

<http://telecom.esa.int/opdt/artesapps/artes20demo/> for **ARTES 20 Demonstration Projects**

<http://telecom.esa.int/opdt/artesapps/artes34satcom/> for **ARTES 3-4 Satcom Applications Projects**

Access is granted to users who registered at the ESA Telecom website. New users can register [here](#).



Modules of the Outline Proposal Development Tool for ARTES Applications

Upcoming IAP Open Competitions



- Smart Cities (FS): Q3 2014.
- Open Data and Crowd Sourcing (FS): Q3 2014.
- Space Based Services for Railway Signaling (FS): Q4 2014.

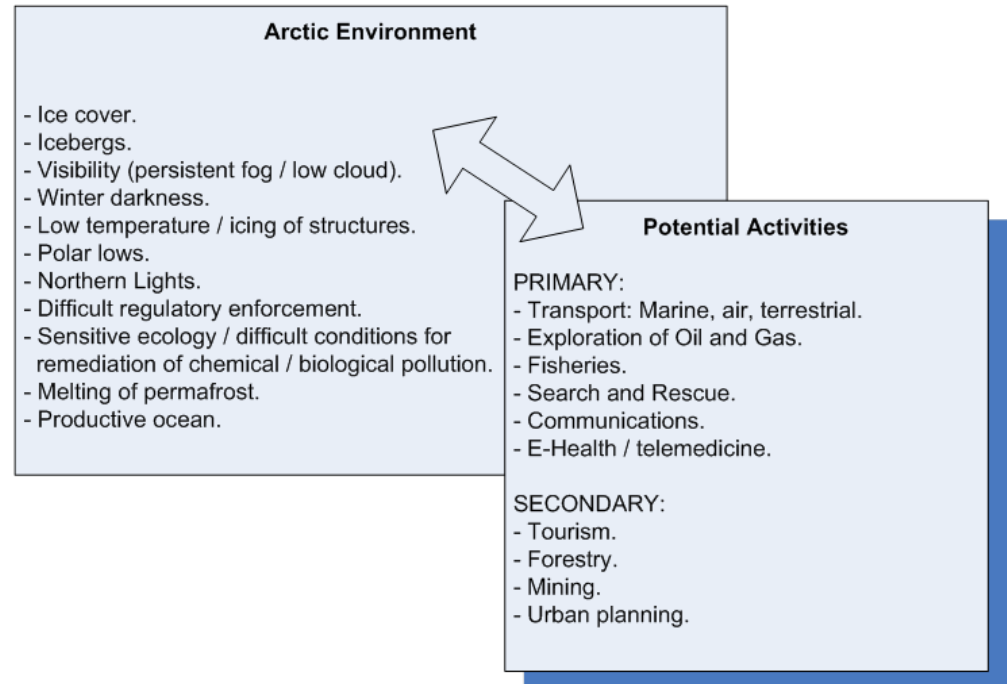
Information to be found on the IAP website (announcements):
artes-apps.esa.int

and on ESA's electronic tendering system (tender documents):
emits.esa.int

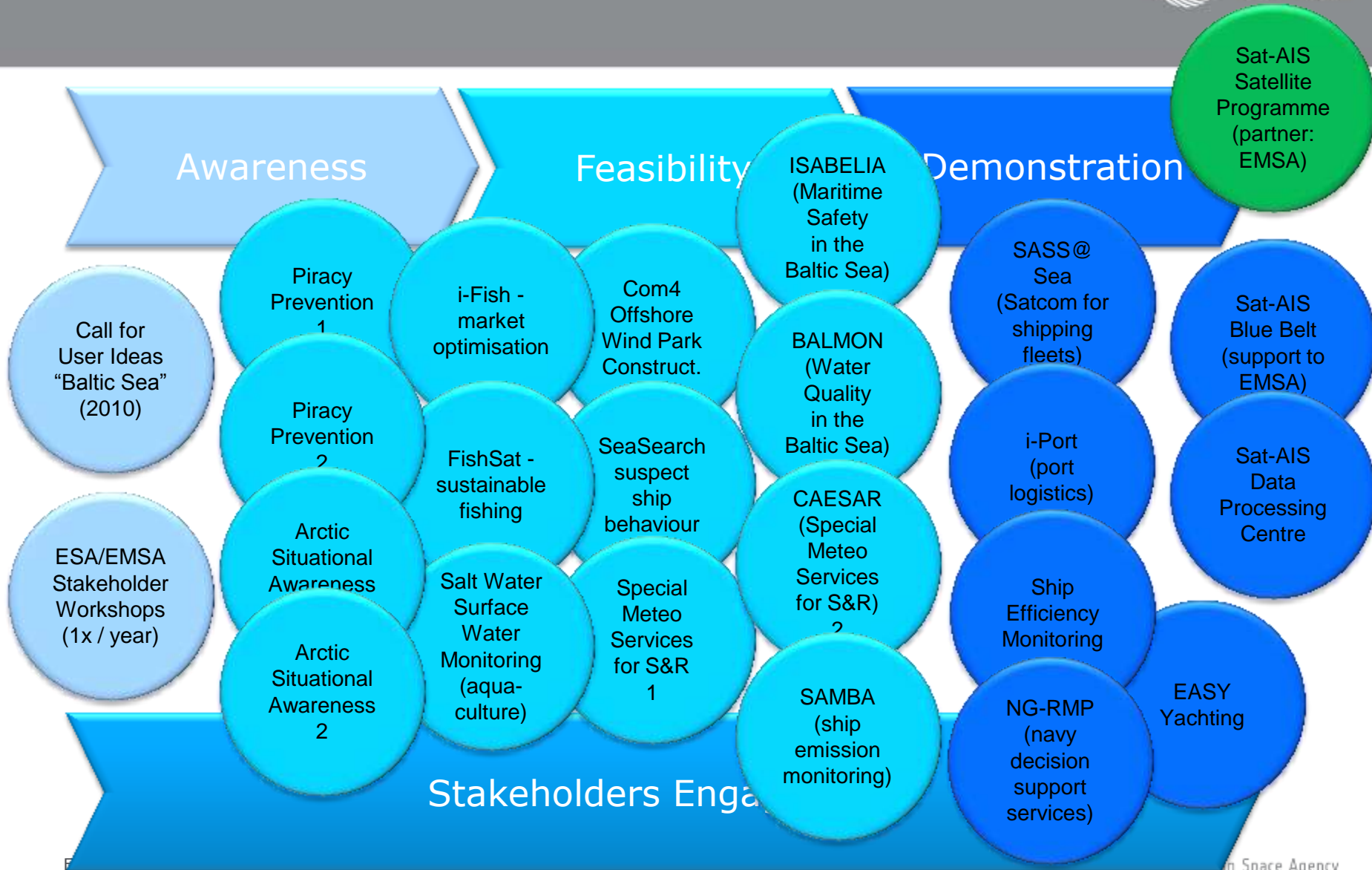
Example thematic areas of relevance to Norway for ARTES Applications ...



- Arctic operations.
- Oil and gas exploration.
- Search and Rescue.
- Fisheries and aquaculture.
- Ship routing.
- Maritime weather forecasting.
- Intelligent freight transport.
- Ice condition forecasting.
- Oil spill response.
- Telemedicine.
- Environmental impact analysis, e.g. offshore renewable developments.
- Avalanche forecasting.
- Forest Management.
- Energy efficiency of buildings.
- Space Weather.



Multiple Activities in the Maritime Domain



Space Weather data Application and Services



Watching the space weather

For high latitudes a better understanding and operational monitoring of the Sun and Space Weather is important for many reasons:

- Power grid companies need to be alerted about solar storms that can induce strong currents in the power grid and cause damage to the system.
- Solar storms can degrade navigation systems such as GPS. Thus, we are monitoring the ionosphere using geodetic GPS reference stations to allow for correction for solar induced errors in the GPS signal.
- Norway is especially interested in the rapid ionospheric changes affecting navigation accuracy over the large ocean areas in the Norwegian Sea and the Barents Sea. In fact Norway has responsibility for issuing navigation accuracy warnings to seafarers in these areas.
- Dynamic positioning of oil drilling ships/platforms, directional drilling, radiocommunication, and helicopter operations in the polar night have especially strong needs for space weather information.



The EMSA/ESA SAT-AIS initiative steps taken so far





The Automatic Identification System (AIS) is a short range coastal tracking system currently used on ships. It was developed to provide identification and position information to vessel and shore stations. Space-based, or SAT-AIS will provide AIS data via satellite, allowing for the detection of seafaring vessels equipped with AIS tracking devices.

A European-based SAT-AIS is an initiative in partnership with the European Maritime Safety Agency (EMSA) and ESA. The ARTES 21 SAT-AIS element defines the design/investigation of a sustainable space-based system that will provide AIS data.

SAT-AIS Initiative Background

Events Overview



January 2010	• 1 st EMSA/ESA Information Meeting in Lisbon
February 2010	• JCB Meeting (Info. Note ESA/JCB(2010)18)
March 2010	• SAT-AIS Information Meeting
April 2010	• SAT-AIS 1 st Industry Information Workshop
May 2010	• JCB, SAT-AIS documents discussed & finalised
July 2010	• EMSA / ESA Agreement signed by DG and EMSA Director
July 2010	• JCB approved ARTES 21 with achieved subscription level
September 2010	• SAT-AIS 2 nd Industry Information Workshop
December 2010	• Final Presentation phase A studies, Steering Committee mtg
January 2011	• 2 nd EMSA/ESA Information Meeting at ESA
January 2012	• 3 rd EMSA/ESA Information Meeting at ESOC
November 2012	• Ministerial Conference
January 2014	• 4 th EMSA/ESA Information Meeting at EMSA

The Council on Ministerial Level in 2012 concluded that:

ARTES 21: the Satellite-Automatic Identification System (SAT-AIS), will, in cooperation with the European Maritime Safety Agency, develop a sustainable space-based service that will identify and track vessels around the globe. SAT-AIS secured funding for 2013–15, when it will be completely operational as a new service.

(extract of the Ministerial council 2012, Fact sheet)

SAT-AIS Implementation Programme: Objectives



The main objective of the SAT-AIS Implementation Phase is to provide enhanced SAT-AIS quality and continuity via EMSA for the benefit of European institutions and member states. This will mitigate the risk of insufficient performance and data non-availability in medium term.

In the SAT-AIS Programme, ESA will support (via PPP) the development of innovative elements of micro-satellite systems (proposed by industry).





The 4th EMSA/ESA SAT-AIS Information Meeting took place on 21st of February 2014 at EMSA premises in Lisbon

The meeting was attended by more than 50 participants from EMSA/ESA participating member states, EC-DG Delegation and representatives from industry. Norway was represented by Mr. John Erik Hagen, Regional Director of NCA, and Coordinator of IMO Correspondence Group on e-navigation

European SAT-AIS Initiative

Implementation phase – EMSA/ESA collaboration



ESA's Telecom Programme
SAT-AIS Design Phase

**Min. Conf
2012**

ESA's Telecom Programme
SAT-AIS Implementation Phase



SAT-AIS PROGRAMME

**SAT-AIS Microsat
development:
Innovative Micro-
Satellites /
Technologies**

**60-110 kg class
N x satellites &
improved antennas
& processing**

Novel Receiver Development

Micro-Satellites Development

Service Element:
Innovative SAT-
AIS Applications
and Services

Open call for
commercial or
institutional
applications

**EMSA/ESA
Roadmap for
Sustainable
Services**

SAT-AIS Programme

Current Industrial activities



ARTES-21 activities are industry initiated for

- Innovative Technologies and Micro-Satellites
- In Cooperation with National and Private Mission Operators

➤ Novel SAT-AIS Receiver (NAIS)

- Kongsberg Seatex (KSX) Prime for the NAIS receiver development
- NSC is NORSAT-1 Mission prime



➤ ESA SAT-AIS Constellation (E-SAIL)

- LuxSpace (LXS) is Prime for the E-SAIL Satellite development
- exactEarth (eE) is Mission prime



ARTES Applications Activities

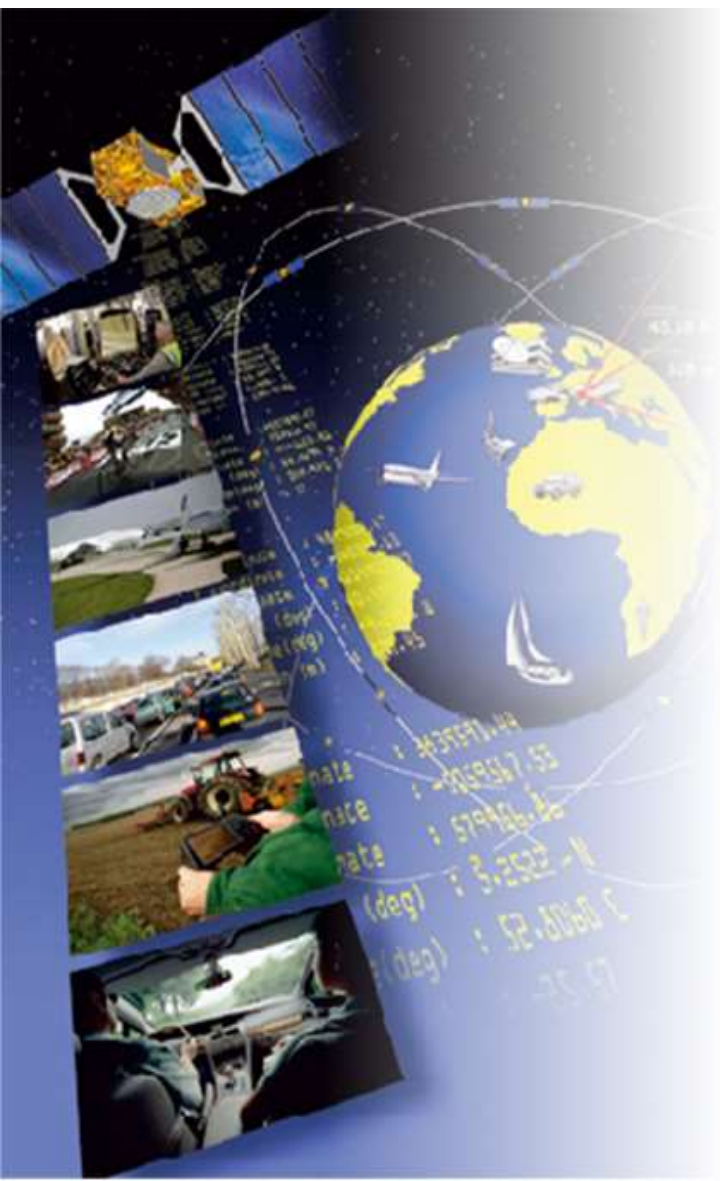
Our Service Offer



- **Financial support** in the co-funded programmes ARTES 20 (Integrated Applications Promotion) and ARTES 3-4 (Satcom Applications).
- **Consultancy (technical, commercial, management)** from idea generation until introduction of a sustainable application / service.
- **Match-making** with companies having complementary know-how.
- **Access to ESA's technological expertise** in a number of disciplines covering not only space.
- **Networking within and access to** the community of the ESA Telecom and Integrated Applications programs (regular workshops on various subjects), i.e. a plethora of organisations and industries.
- **Organisation of awareness activities** on specific subjects (thematic workshops, PR campaigns, etc).
- **Credibility** through the involvement with ESA as internationally acknowledged organisation.

Know-how / expertise of the IAP team

- Direct technical know-how in:
 - Satellite Communications (IAP located in Telecoms Directorate).
 - Satellite Navigation.
 - Earth Observation.
 - Human Spaceflight.
 - ICT.... access to know-how on space in other ESA Directorates.
- Direct commercial / business development know-how.
- Team members with:
 - 15 years of expertise of applications developments.
 - 10 years of start-up developments.
- Contacts to 100s of companies all over Europe in a diversity of technology and application fields.



Thanks for your attention !

- Tony Sephton: Tony.Sephton@esa.int
- Jan Dettmann: Jan.Dettmann@esa.int
- ARTES Applications Website:
<http://artes-apps.esa.int/>
- ARTES Applications Open Calls for co-funded activities on EMITS at:
<http://emits.esa.int> (ITT AO6124, AO5891, AO5658)
- Information on ARTES Applications Opportunities at:
<http://artes-apps.esa.int/opportunities>
- ARTES Applications general email address:
artes-apps@esa.int