Presentation of ARTES Applications

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Presentation outline

A) What are ARTES Applications?

B) Application examples

C) How can we work together?

What are ARTES Applications?

What are ARTES Applications?

ARTES Applications programs support the development of new **applications** that leverage on **space assets**.

Incubator for space applications

What are ARTES Applications?

Goals & benefits

- For ***ESA***: Foster utilization of existing space capabilities for the benefit of the European society

- For ***industry*** *(service providers / product suppliers)*:
  - Reducing the risks associated to developing new applications => Development of portfolio of products / services and improvement of competitiveness.
  - Access to new markets.

- For ***users***: Space applications support better operations, i.e. increase performance, improve safety, and/or reduce costs

What are ARTES Applications?

- Applications can be **products** or **services**.

- **No topical restrictions**

  any application domain is acceptable e.g.

  Health, security, transport, energy, environment, agriculture, etc…

What are ARTES Applications?

- Applications shall be **sustainable** (operationally, commercially, legally)

- **Short time to market** applications,

  i.e. enabled by existing space infrastructure and mature technologies.

What are ARTES Applications?

ARTES is a «frame» programme which hosts different elements. Each of these elements has a set of specific objectives and conditions.

ARTES applications are implemented by two possible programme elements:

- ARTES 3-4 (Satcom applications – **industry driven**)
- ARTES 20 = IAP (Integrated applications – **User driven**)

What / How do we support?

We support two types of activities:

1)Feasibility studies

2)Demonstration projects

User

Ambassador platforms

Awareness

3 months

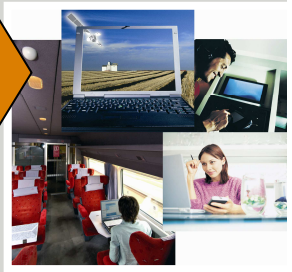
Feasibility

12 months

Demonstration

2-3 years

Service



What are ARTES Applications?

ESA supports by…

- Acting as a **broker** between service providers, developers and the user communities
- Providing **financial support**
- Providing **technical and business assistance**
- Providing **credibility** to the project (and involved organisations)

What are ARTES Applications?

2 possible **procurement set ups** :

- **Direct negotiation**: the activity is initiated by a consortium (co-funded) following the requirements of the continuous open call for proposals in AO 6124

- **Open competition**: ESA issues an Invitation To Tenders (fully funded)

Application examples

ESA's Integrated Applications Promotion Programme (ARTES 20)

2 examples showing a good content and setup:

1st example under the theme "Safety & Security" targeting an institutional user:
Integrating Space Assets for UK Civil Resilience

2nd example under the theme "Energy" targeting a commercial user:
Electricity grid maintenance and recovery

Integrated Application Promotion
THEME: Safety & Security

Integrating Space Assets for UK Civil Resilience

Integrated Application Promotion
UK Civil Resilience

Motivation:

- Summer 2007 floods, worst in UK history
- British resilience teams overloaded

Box 1: Pitt Review

In the exceptional events that took place, 13 people lost their lives, approximately 48,000 households and nearly 7,300 businesses were flooded and billions of pounds of damage was caused. In Yorkshire and Humberside, the Fire and Rescue Service launched the "biggest rescue effort in peacetime Britain".* Across Gloucestershire, 350,000 people were left without mains water supply – this was the most significant loss of essential services since the Second World War. Other critical infrastructure was damaged and essential services including power supplies, transport links and telecommunications were disrupted.

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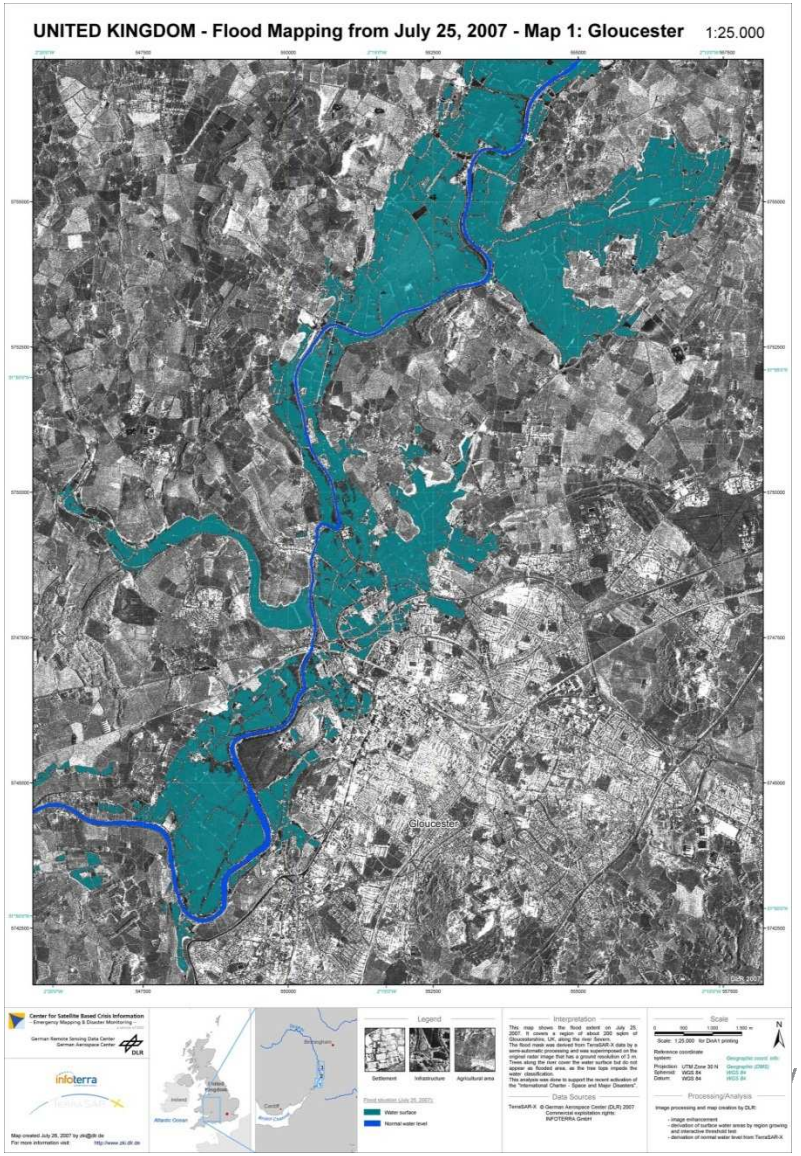
* General Secretary Matt Wrack, Fire Brigades Union Press Release 28 June 2007



Integrated Application Promotion
UK Civil Resilience

Users providing support to the activity:

- **Civil Contingencies Secretariat (CCS) (backbone user)**
- Department for Environment, Food and Rural Affairs
- Department for Transport
- Highways Agency
- Environment Agency
- Health Protection Agency
- Welsh Assembly Government
- Government Office for the East of England
- East Coast Flood Planning Group

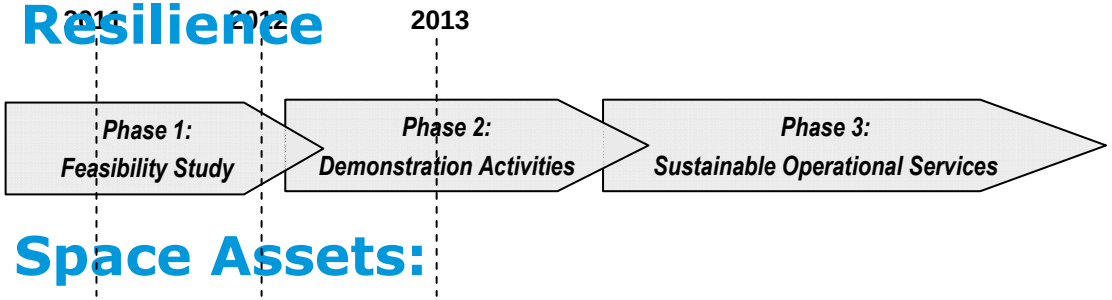
Potential users of a resultant solution

Integrated Application Promotion
UK Civil Resilience

Feasibility Study: Integrating Space Assets for UK Civil Resilience

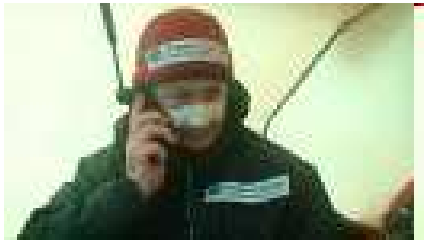
Objective:

- Identify space-based services for UK Civil Contingencies.
- Analyse current space and terrestrial solutions.
- Prepare the way for the implementation of the most promising services.



Space Assets:

- **EO data** for prevention / monitoring / damage assessment in real- or near-real time.
- **Satellite Telecommunications** to provide additional coverage over damaged areas.
- **Navigation** for resource location and guidance.

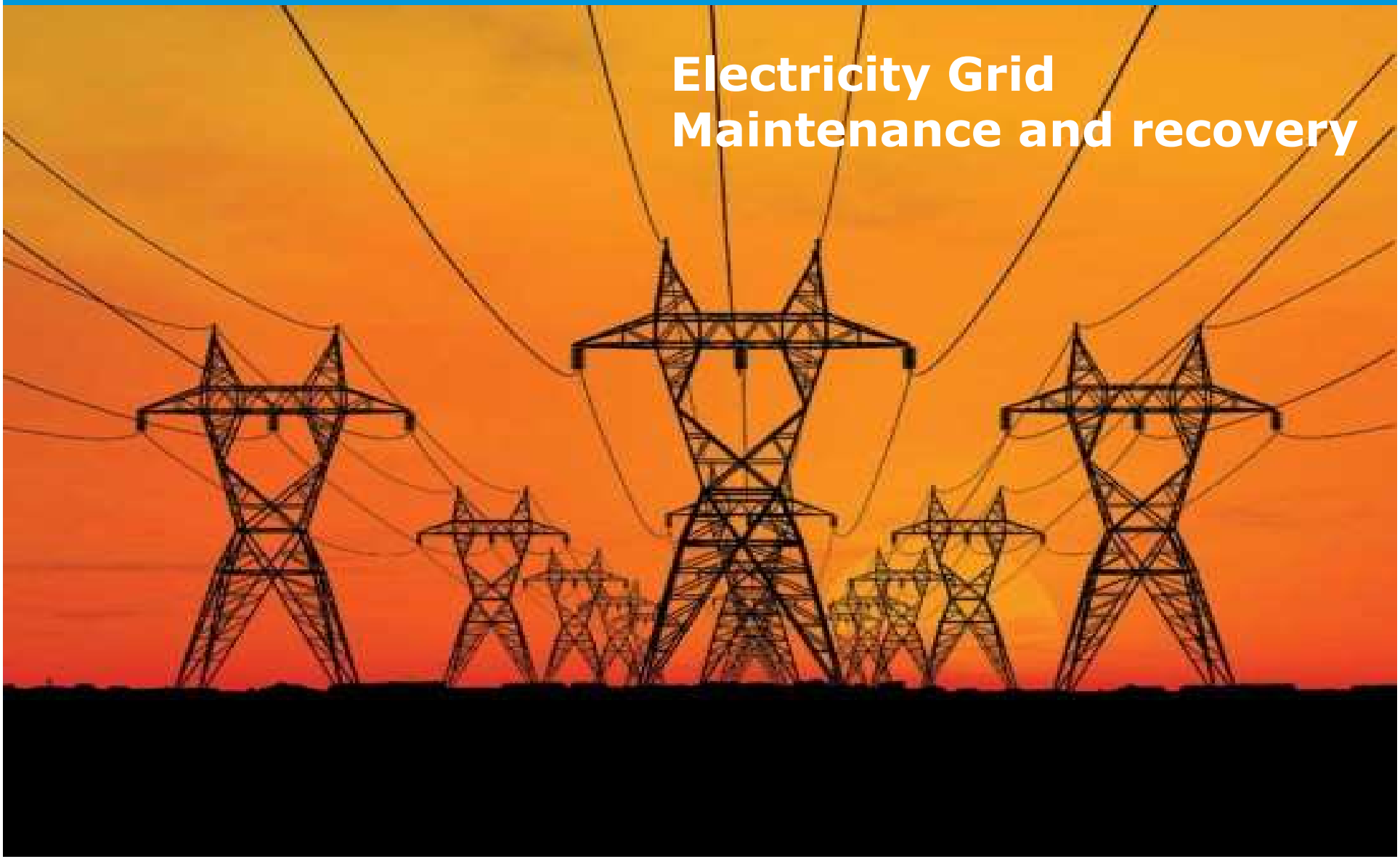


Integrated Application Promotion
UK Civil Resilience

What makes this a promising IAP activity?

- The **backbone user** is of high political level and **able to take decisions** in the institutional environment
- The user community has a **serious demand** and is **open for solutions** to improve their operational situation
- The consortium consists of operational / institutional **service providers and industries** with good technological background
- The consortium is **open to investigate** the technologies that are needed to serve best the user demand

Integrated Application Promotion
THEME: Energy



Electricity Grid
Maintenance and recovery

Integrated Application Promotion
Grid maintenance and recovery

User:

Transmission Systems Operators:

RTE (F) and Elia (Be)

Objectives:

- Improving the performance and cost efficiency of maintenance
- Reduce recovery time

Motivation:

Costs

Improve supply continuity

For Transmission Systems operators, power cuts results in

- Loss in revenue
- Penalties

Maintenance of the network is extremely costly.

Legal obligations

- The power supply shall be recovered within 5 days

Integrated Application Promotion
Grid maintenance and recovery

Space Assets:

- Earth Observation data: Detection of wrecked pylons
- Satellite navigation for (maintenance) aircraft navigation, attitude control, and sensor pointing.

Integrated Application Promotion
INTOGENER

What makes this a promising IAP activity?

- The **backbone user** (RTE) is one of the major TSO in Europe with sufficient **commercial power and market influence**
- The user has a **strong need** to reduce its operational costs on maintenance
- The user is **open to adopt new processes** to make their operations more efficient
- The user is **open to collaborate with other users** towards a cost effective solution applicable to all TSOs.

Other activities

Safety / Security

SASISA: Small Aircraft Service for Instant Situational Awareness

VAMOS: Volcanoe Monitoring from Space

EagleSpace: Information support to cross-border crisis management

Early warning of coastal floods

Energy

PIMS: Pipeline Integrity Management System

Services supporting the wind power industry

IntoGener: Services supporting the hydropower industry

Health

T4MOD: Remote Assistance for Medical Teams Deployed Abroad

Predict: Prevent and respond to epidemics

Gulliver: Tracking pharmaceuticals

Voyage: Health care for people on the move

Environment / Agriculture

Savewater: Integrated satellite AUV services for sustainable water management

Bioscope: Integrated satellite + UAV services for vegetation monitoring

iTRAQ: Integrated Traffic Management and Air Quality Control

FruitLook: Water use efficiency of vineyards and fruit orchards

Transportation

DG-Track: Support of dangerous goods transport in the medical sector

Improving Safety at Railway Level Crossings

Predicting, monitoring and alerting of landslides and subsidence affecting the transport infrastructure

How can we work together?

How can we work together? Awareness activities

- Cross participation in **workshops and events**
  - Information on the benefits of space services for users
  - Exchange of experience among users
  - Information on opportunities of the ARTES Applications programmes
- **Channel ARTES applications opportunities** to relevant industry or user community in your region (broadcasting / targeted)
- **Pooling of network** (user communities, service providers, etc…)

How can we work together?
Elaboration of new activities

If you are a user (e.g. regions, public institutions, companies)

Expression of needs

- Respond to call for ideas
- Interact directly with us

If you are a service provider

- Respond to our open call proposals AO 6124 (co-funded)
- Respond to our ITTs (Fully funded)

How can we work together?
Elaboration of new activities

The right content and set-up:

- a "good" user with a problem in demand of a solution
- a service oriented mindset (not technology driven)
- a strong team (strong leadership, right mix of partners)
- operational, technical, commercial know-how
- the willingness to go for it (3years)

… and, of course, more than 1 space asset to be integrated

Thank you

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BACK UP SLIDES

Space for Agriculture

TalkingFields

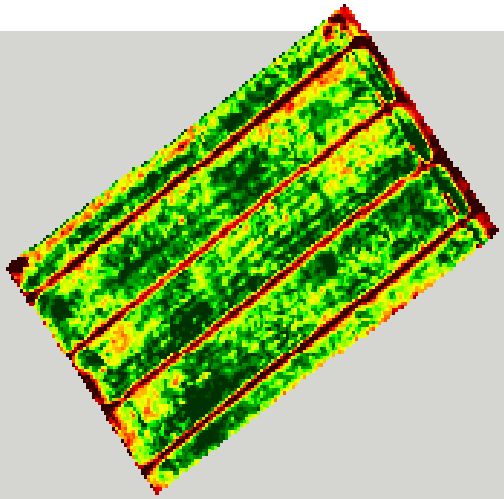
Precision Farming

- Improved agricultural productivity
- Higher yields / production savings
- Site-specific cultivation
- Integrative use of satellite techniques and intelligent services

BIOSCOPE

Vegetation Monitoring Service

- For farmers and managers of natural sites
- Image acquisition from satellites and UAVs, to improve service availability and flexibility.



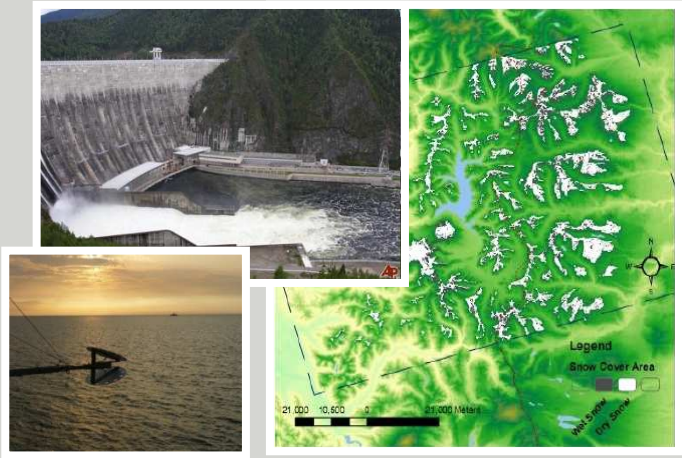
Space for Energy

SpaceGrid

- 43000 km of Power Lines in Italy
- Interference of safe corridors by building and vegetation
- **Change detection** by Optical **Earth Observation**
- Monitoring of land subsidence
- **SatCom** as a grid-wide **back-up system**

INTOGENER

- INTegration of EO data and GNSS-R for ENERgy Applications
- Support to **hydropower** plant operation in Chili
- Large area water level monitoring using GNSS-R (reflected signal)
- Earth Observation SAR (snow height) and Optical/IR (temperature) integrated with water flow models
- SatCom for remote data transfer



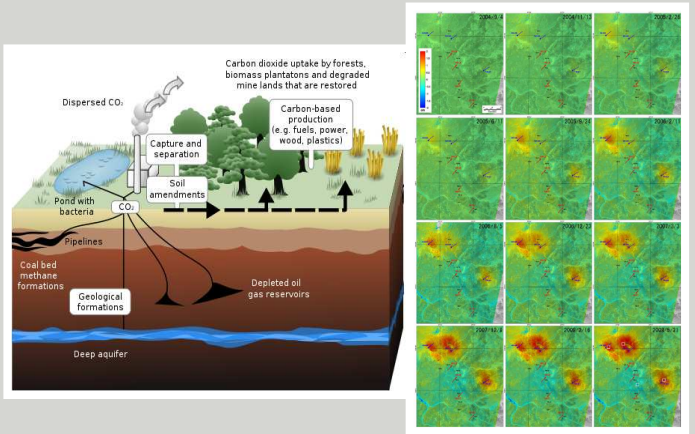
Space for Energy

CSP-FoSys

- Concentrated Solar Power Forecast System
- Nowcasting/Forecasting of input to power grid based on Earth Observation data (meteo)
- Real-time provision via SatCom
- GNSS considerations: in-situ measurements and consistent time-tagging

CCS-SpaceMon – Carbon Capture & Storage

- Subsidence monitoring using multitemporal SAR
- Calibration and confirmation using differential GNSS
- SatCom for data communication and remote monitoring



Space for Energy

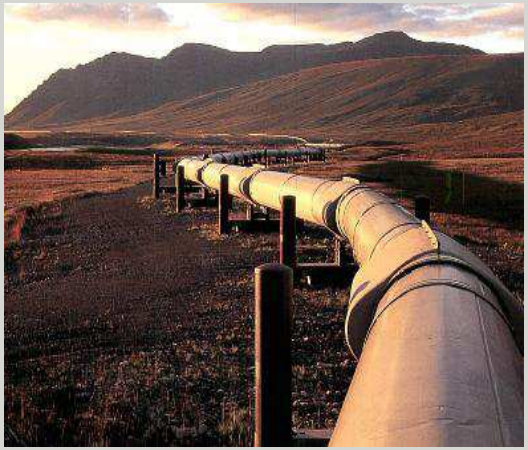
PIMS In Space – Pipeline Integrity Monitoring Service

– Monitor third party interference, land erosion and subsidence with help of Earth Observation (SAR, optical, helicopter w. GNSS)

– Remote monitoring of pipeline integrity (SatCom)

– Integration with PIMOA tool to provide early warning service

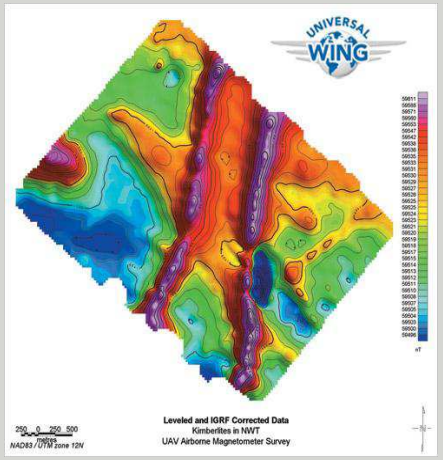
– Maintenance support (GNSS)



UASatCom

- Using small Unmanned Aircraft for Geographical Surveys and Oil & Gas Pipeline monitoring

- Service for exploration companies and oil & gas production companies



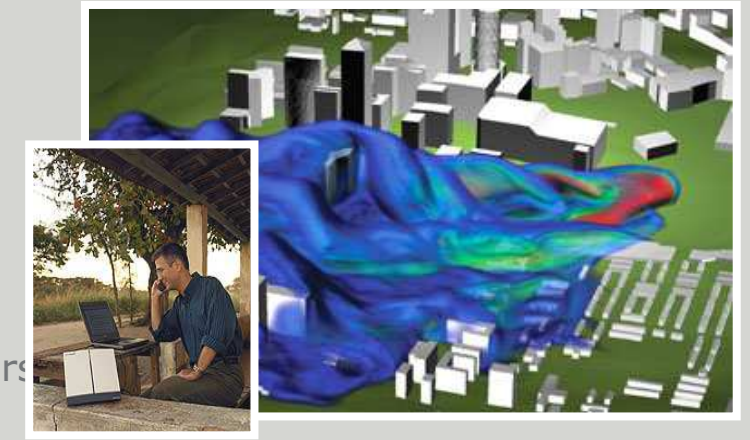
Space for Health

SAFE: SAtellites For Epidemiology

- SatCom (VSAT) for internet & tele-conferencing (local Wifi)
- Electronic surveillance & GIS
- On-site biological analysis
- Demo Greece : Heraklion earthquake
- Operational service Georgia : Tuberculosis surveillance

HEWS: Health Early Warning System

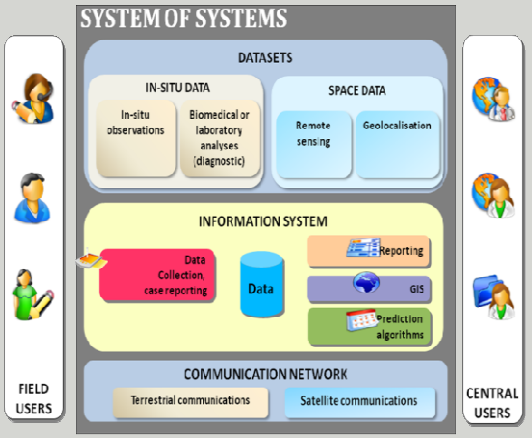
- SatCom for acute disease outbreaks
- Demo Portugal : Anthrax attack
- Demo Angola : Hemorrhagic (Marburg) Fever outbreak
- Connect local health professionals with provincial authorities
- Satellite phone in field, VSAT/BGAN in coordination centers



Space for Health

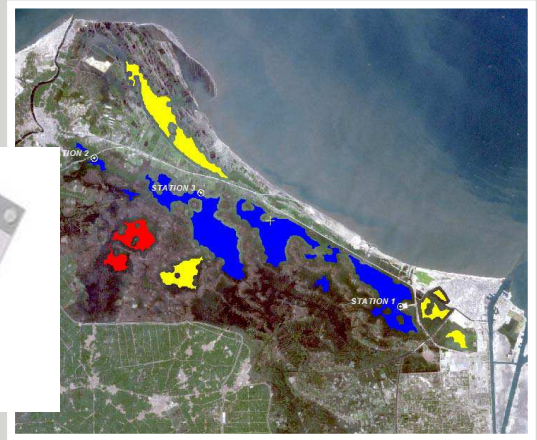
PREDICT - Senegal

- Prevent and Respond to Epidemics and Demonstrate Information and Communication Technologies
- Direction des services vétérinaires (DSV)
  - Monitor, collect data of network of veterinary stations
  - Inspection teams with mobile SatCom
  - Central dBase plus GIS, vegetation, water bodies



Water quality monitoring

- Pilot study Lake Manzalah, Egypt
- Combining in-situ measurements and EO data
- Improved resource management
- Extension to other lakes planned



Space for Health

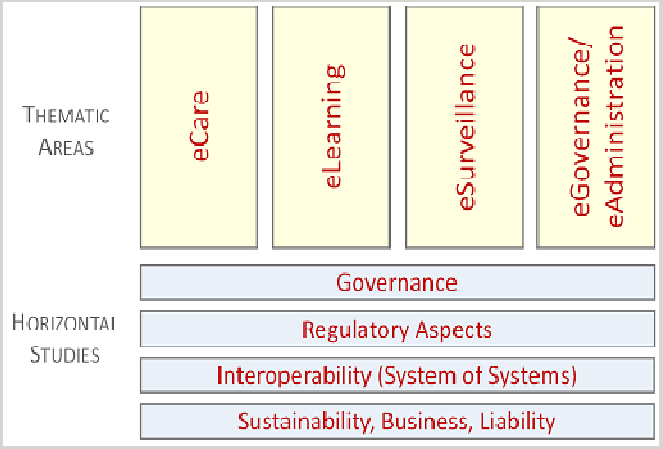
VECMAP

Mapping disease vectors

- Regional & national level
- Optimizing & integrating in-situ sampling, EO data and spatial modelling
- Service for pest controllers, public health & academics

eHealth in Subsaharan Africa

- Program of 4 studies in 4 thematic areas
- Governance, Regulations, Interoperability, Sustainability
- Themes: eCare, eLearning, eSurveillance, eGovernance
- Funded by Lux Development (European Investment Bank)



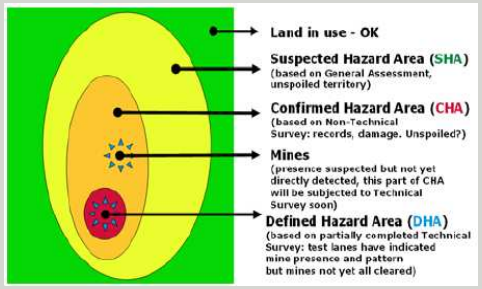
Space for Health

AMAZON

Dual-use vital signs monitoring service for professionals

- Conventional in-situ monitoring
- Remote diagnosis features
- Multimodal space-based connectivity
- Localization features for faster first medical aid delivery

Space for Safety



Space Assets for Demining Assistance

Services for Mine Action (3 Studies)

-Maps for planning, prioritization and reporting

-Risk maps based on integrated indicators of mine presence/absence

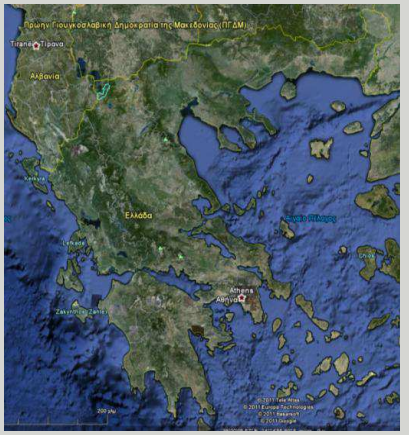
-Field survey & field operations support

-Integration with GICHD's Information Management System for Mine Action (IMSMA)

Land Border Control

Services for controlling of land borders

- Maps and surveillance
- Patrol Track & Trace
- Communication services
- Common operational picture



ISIDE (Innovative Satellite Interactive Digital Entertainment)

ISIDE

- On-line catalogue to order and purchase movies
- Very high bi-directional satellite data rates (up to 100 Mbit/s in forward) to multicast movies to cinema theatres in Italy, Germany, France and Spain
- Live events (e.g. sport, operas, virtual theatres, seminars)
- Encryption, Digital Rights Management (DRM) and billing
- Remote Monitoring&Control

Space for Safety

UK Civil Resilience

- Integrated operational services
- Existing space assets
- UK resilience community
- Quality, reliable, simple information
- Smartphone application

TWIM : Two Way Information Management

- Improving responses to accidents and emergencies
- Allowing the general public to report emergencies through mobile devices
- Supporting emergency services and coordinators
- Informing public on emergencies

Space for Safety

SINUE

Satellites for the Integration in Non-segregated airspace of UAS in Europe

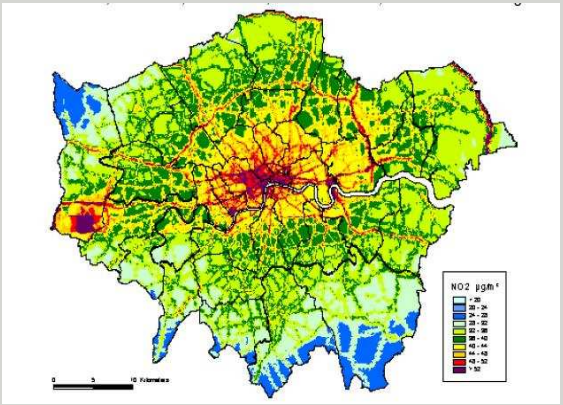
- UAS with sensors
- Satellite communication for Command & Control and real-time relay of sensor data

Space for Transport

SSMART

Services for transport of dangerous goods

- Transport planning
- Track & Trace and monitoring
- Incident management



iTRAQ

Integrated Traffic Management and Air Quality Control Using Space Services

- Optimizing traffic flow and air quality

Space for Transport

DG - TRAC

- Supporting Dangerous Goods Transport Tracking and Tracing in the Medical Sector
- Providing Location of Transported Medical Goods,
- Provides information on goods in case of emergency
- Services support medical institutions, logistics companies and public safety services

ECO2FLEET

- Supporting drivers in "Green Driving"
- Reduction of fuel costs, and CO_2 emissions
- Service for Fleet Operators

Space for Transport

Predicting, Monitoring, and Alerting of Landslides and Subsidence Affecting the Transport Infrastructure

- Improving confidence in predicting terrain movement
- Service for infrastructure operators
- Minimising consequential damage in case of landslide

Optimising Intermodal Freight Transport through European Ports

-Reduce Congestion

-Maximizing efficiency

-Reduce carbon foot print

-Improve Safety and Security

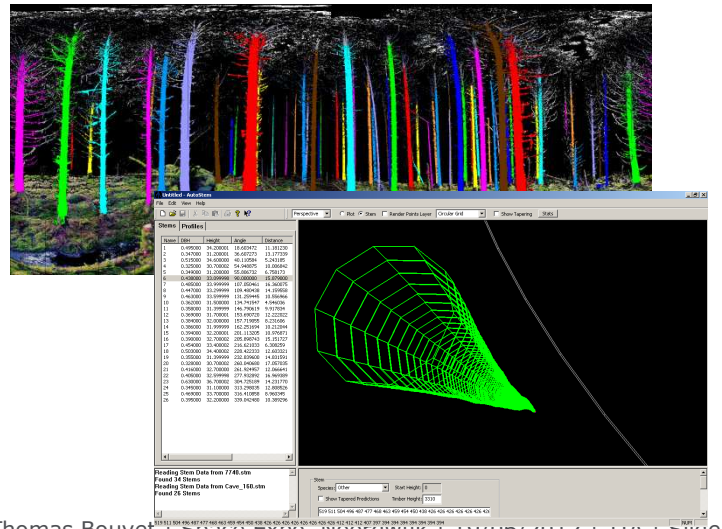
Examples of activities

SATMODO (ARTES 3-4 Satcom Apps)

Prime Contractor: Treemetrics (IRL), 600k ESA price

Objective: Live guidance and monitoring of round-wood timber harvesting, using trees inventory using laser scan, and satellite and terrestrial wireless technology to provide instruction to harvesting machines and collect feedback to monitor the process and validate the inventory

Project Duration: 15 months, **Users involved**: Coillte, Green Belt and Scottish Forestry association



BIOSCOPE (1/2)

Background

- Farmers need timely information on the status of their crops, at specific times during the growing season, so they can plan their field operations (e.g. application of fertilizer, irrigation, harvest). Thanks to remote sensing farmers can map the spatial variability of the crop status and perform precision farming, thus saving on costs and preserving the environment.
- Nature managers of Natura 2000 sites have a legal obligation to monitor the vegetation on a regular basis, to report on the evolution of habitat and biodiversity. Use of remotely sensed imaged drastically reduces field work. Yet, the timing for image acquisition during the vegetative cycle is critical.

- The timing for image acquisition is critical: the time window for acquisition is short, and the planning for acquisition comes on short notice. Cloud prevent acquisition of images in the IR / Visible spectrum. The problem of availability of images is problematic in cloudy countries such as the Netherlands or Belgium. It undermines the use of space imagery for agricultural and nature management purposes.

- *Need to develop a service which can reliably deliver images on the status of the vegetation within a short time window (3 to 10 days to 3 weeks) , and upon short notice (1 to 6 weeks)*

BIOSCOPE (2/2)

Objective of the Feasibility Study

- Assess feasibility and viability of a service for vegetation monitoring aimed at farmers and managers of natural sites.
- The system is based on the integration on:
  - Space & aerial (UAV borne) imagery
  - GNSS technologies
  - Processing software to calibrate data, co-register images, retrieve information and produce maps.

Project team and users

- Prime: Terrasphere (NL)
- Subs: Aerovision (NL), Aurea Imaging (BE), CRP Lippmann (LUX)
- 11 users from NL and BE, incl. farmer organizations and bodies in charge natural reserve management.

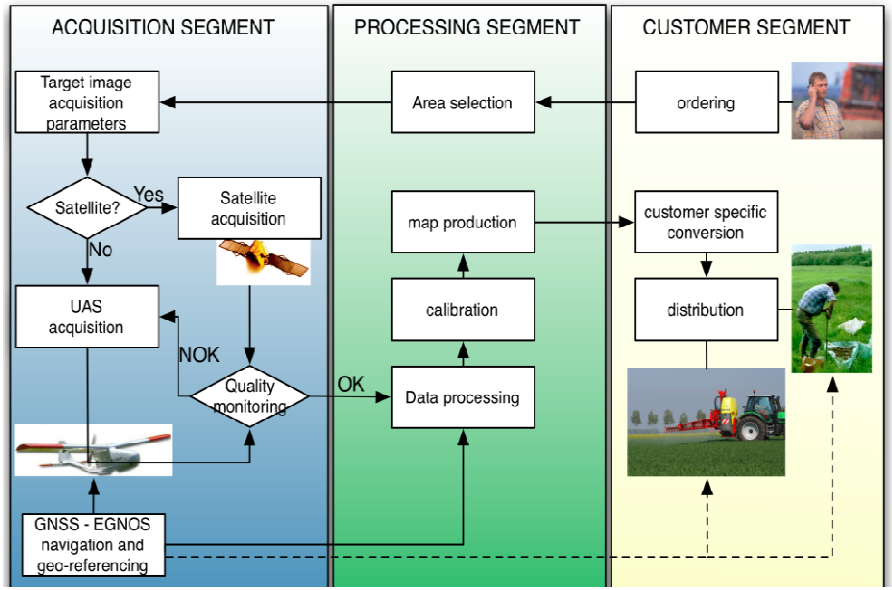
Budget:

- 315 k€ (Direct Negotiation)

Added-value of space

- Earth observation data:
  Ability to systematically capture up-do-date and standardized information over a wide area
- Satellite Navigation:
  - Accurate UAV navigation and positioning
  - Positioning of ground reference points
  - Geo-referencing of UAV captured images

BIOCOPE functional architecture



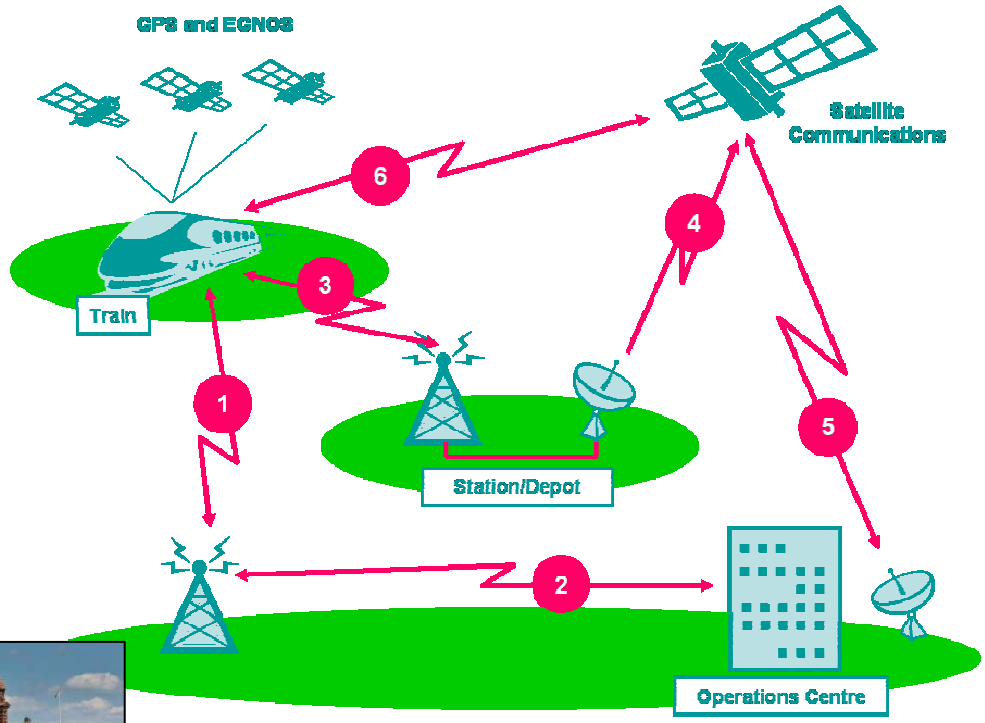
Intelligent Railways via Integrated Satellite Services (IRISS) 1 of 2

Goal of the study

1. To develop and validate a viable and robust business model for the introduction of satellite navigation and satellite communications services within the UK rail transport sector.

This capability will allow train operators to:

1. communicate with their assets irrespective of location and status
2. enable data to be uploaded and offloaded in real time, thus
3. facilitating decision making processes and
4. improving the management operations and incidents.



Intelligent Railways via Integrated Satellite Services (IRISS) 2 of 2

Feasibility Study results

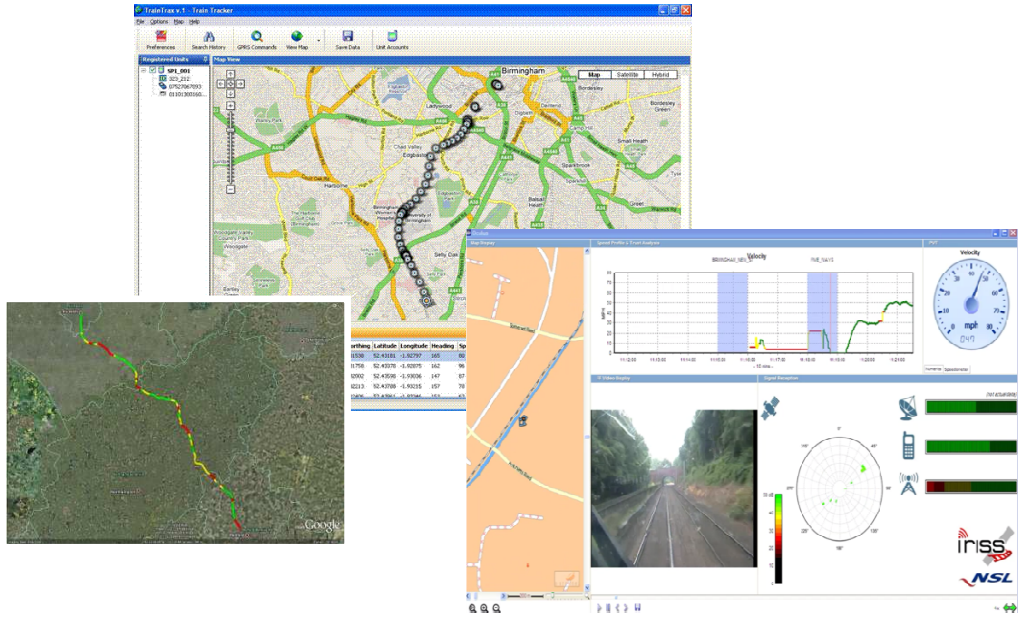
The TITAN system has been developed and extensively demonstrated on both a rural and a high speed train.

Tracking via GPS, GLONASS, EGNOS. INS integration planned.

Seamless communication integrating GPRS, 3G and SatCom. At stations and depots, Wifi is also used for video download.

Via a control center and a webserver, the user receives train monitoring, tracking and communication services:

- Train metering and monitoring download
- CCTV download, image extraction
- Train tracking & geofence alerting
- Driver training/energy management using trip replay service (OCULUS)
- Paging/messaging to train staff



Train tracking software (courtesy of NSL)

Stakeholders involved

- Prime: Nottingham Scientific Ltd (NSL, UK)
- Sub: Avanti (UK)
- Train Operator (East Midland Trains)
- Rolling Stock Companies, Rolling stock manufacturer, Infrastructure Operator (Network Rail)

Budget of Feasibility Study

- 517 kEuro, of which 235 kEuro ESA contribution

Landslide and Subsidence Monitoring (1/2)

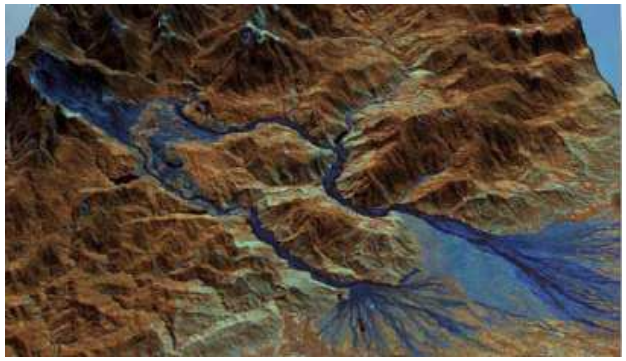
Background

- Landslides and subsidence constitute a major geological hazard, naturally occurring or affected by human activities (land use),
- Whereas the effects of landslides and subsidence upon communities in mountainous and coastal areas is well known, less well recognised is the danger of terrain movements to the transport infrastructure across wide areas of Europe,
- Landslide and Subsidence affecting transport infrastructure poses a threat to life and imposes a heavy burden in terms of direct and indirect costs,
- In minimising the consequential damage of landslides and subsidence affecting the transport sector, there is a growing need to predict these events more accurately, to enable preventive measures to be initiated effectively,
- There is a mutual recognition that space based services may provide a solution to improve monitoring, predicting and alerting in case of such an event, and reduce the damage.

Landslide and Subsidence Monitoring (2/2)

Objective of the Feasibility Study

- the study assesses the feasibility of using space based assets to assist
  - in developing models that can accurately predict landslides and subsidence,
  - monitoring and alerting systems in order reduce damage

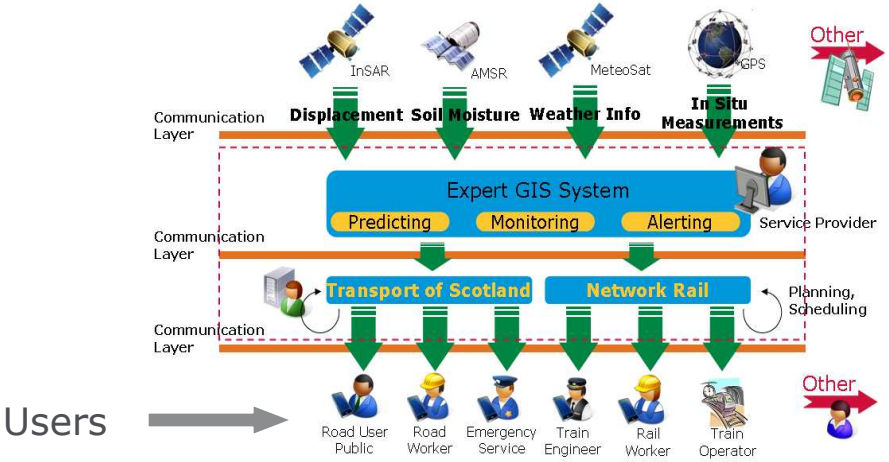


Feasibility Study

- Open Competition
- Budget 300 kEURO (fully funded)
- Duration 12 Month

Added-value of space

- Earth Observation capabilities include the measurement of terrain movement and deformation, vegetation and soil moisture. Also weather (precipitation) information is relevant.
- Satellite navigation can be introduced to locally determine terrain movement, and tracking and tracing of emergency units.
- Satellite communications may be required for data collection from remote areas



European Space Agency

Integrated Application Promotion
THEME: Energy

Integrated Application Promotion
INTOGENER

Motivation:

Money

Any improvement of water flow prediction, even at small scale (5%), has a large positive economic impact for the hydro power producer

User:

Hydroelectric power generation company ENDESA (E), major hydro power supplier in South America

Use case is Lake Laja in Chile

Objective:

Implementation of a water flow monitoring and prediction system to improve the forecasts for hydro power generation

Integrated Application Promotion
INTOGENER

Space Assets:

- Earth Observation data: snow cover area, snow water equivalent
- Insitu information (water level) based on reflected GNSS signals
- Data transfer by satellite communication
- Integration with hydrological model for the water flow forecast.

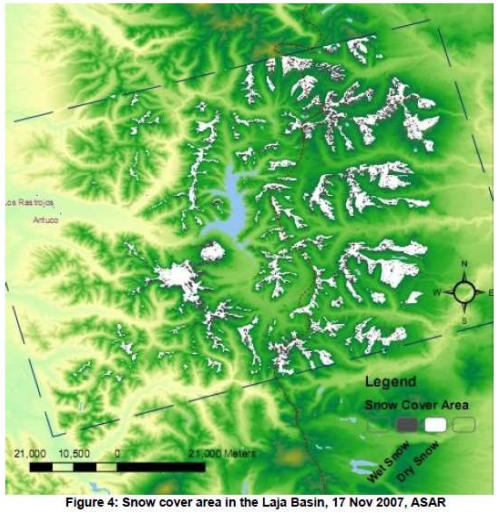
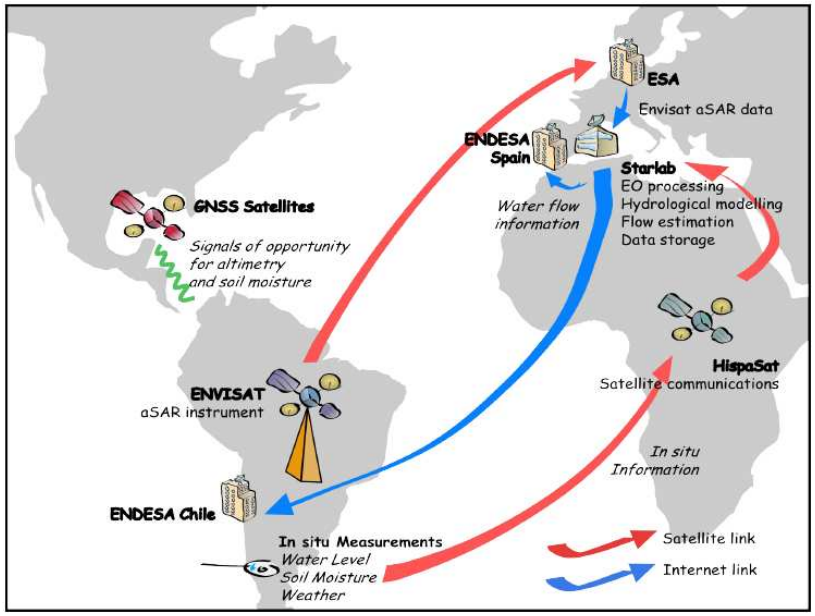


Figure 4: Snow cover area in the Laja Basin, 17 Nov 2007, ASAR



Integrated Application Promotion
INTOGENER

What makes this a promising IAP activity?

- The **backbone user** is one of the major hydro power suppliers in South America with sufficient **commercial power and market influence**
- The user has a **strong interest** in increasing its profits and is interested to become the **service provider** for the solution
- The consortium consists of **industries and research institutes** with good technological background
- The consortium is **open to investigate** the technologies that are needed to serve best the user demand
- The consortium prime has established a **good relationship** with the user already for a few years

Integrated Application Promotion
INTOGENER

What are the hurdles to overcome in this IAP activity?

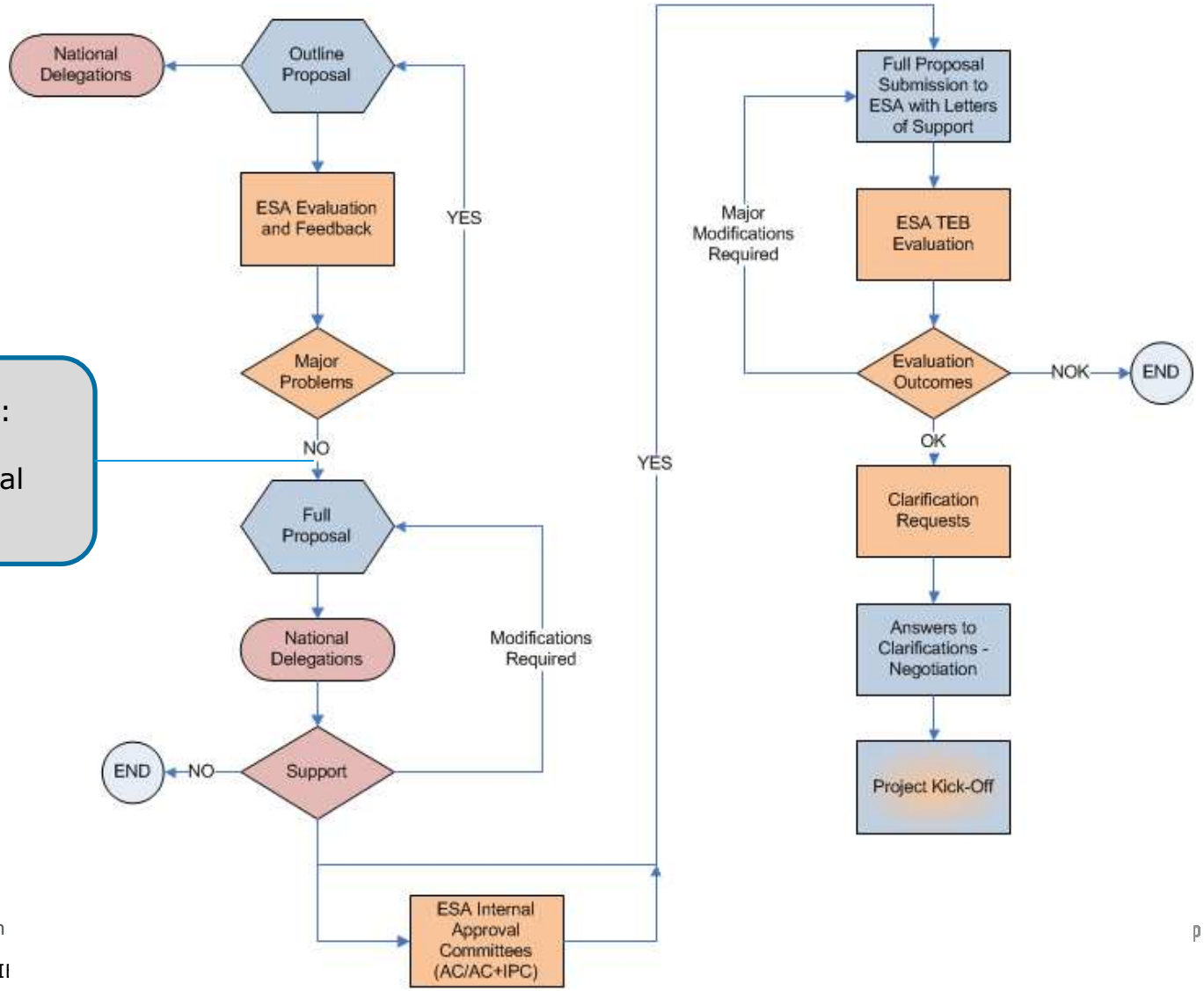
- The user will buy into the solution only if there is an improvement over current forecast achievements
- The service(s) have to be available and reliable (back-up solutions required to avoid single point of failures)

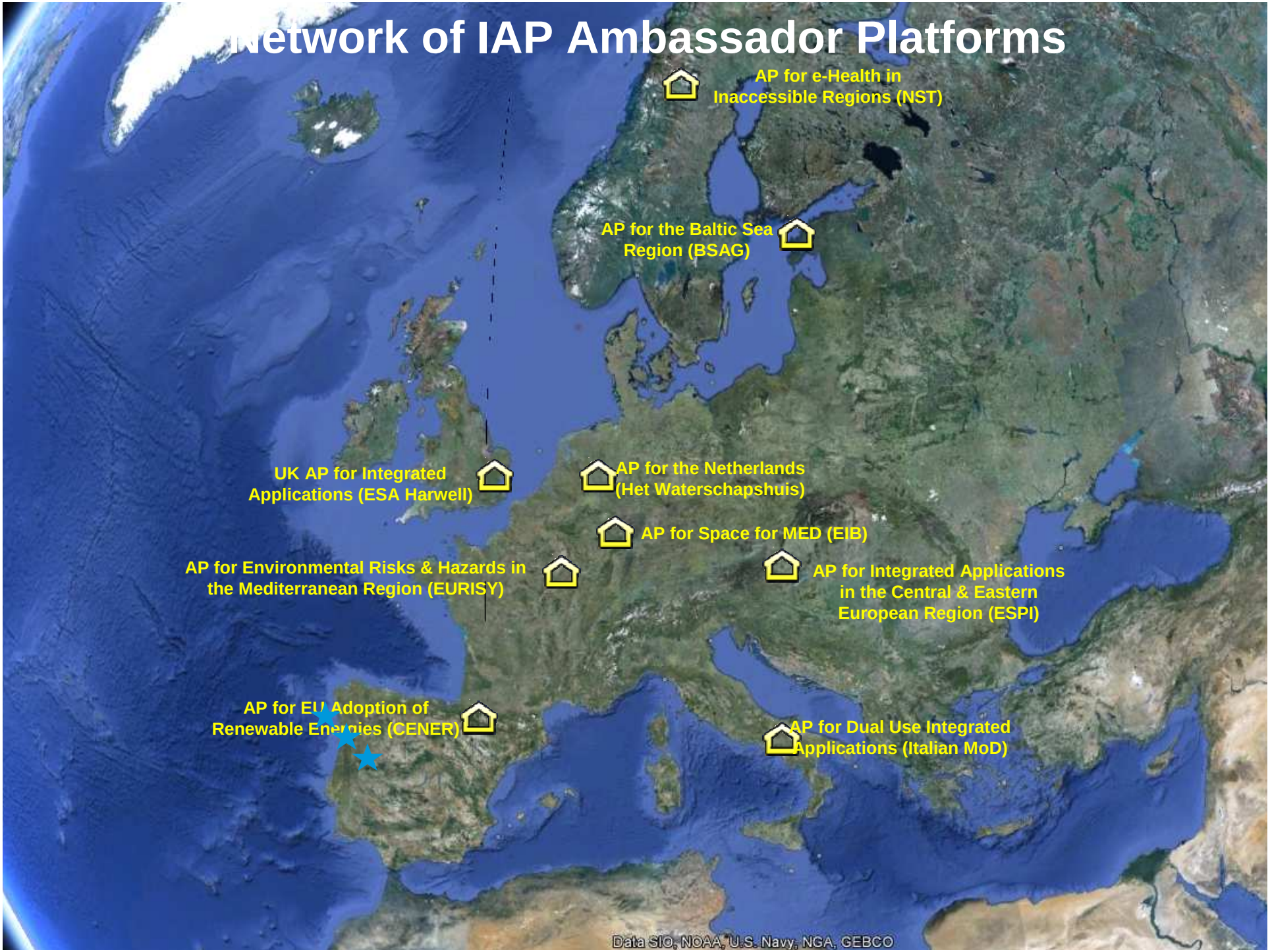
ARTES Applications Programs

	ARTES 3-4	ARTES 20
type of applications	satcom based applications	applications using multiple space assets (min: two)
type of activities	Demonstrations	Feasibility studies + Demonstrations
originator	industry (incl. service providers)	end users, in association with industry where applicable
Procurement type	Direct negotiation (DN)	Direct negotiation (DN) Open competition (OC)
price	50% of the eligible costs	DN: 50% of the eligible costs OC: 100% of eligible costs
ESA approvals	AC > IPC > TEB	JCB > AC > IPC > TEB

Application process

For **ARTES 20**:
Approval by
Board of national
delegations




Network of IAP Ambassador Platforms
AP for e-Health in Inaccessible Regions (NST)
AP for the Baltic Sea Region (BSAG)
UK AP for Integrated Applications (ESA Harwell)
AP for the Netherlands (Het Waterschapshuis)
AP for Space for MED (EIB)
AP for Environmental Risks & Hazards in the Mediterranean Region (EURISY)
AP for Integrated Applications in the Central & Eastern European Region (ESPI)
AP for EU Adoption of Renewable Energies (CENER)
AP for Dual Use Integrated Applications (Italian MoD)
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

The ARTES programme as of today

A balanced combination of generic envelope programme Elements

- ARTES 1: Preparatory
- ARTES 3-4: Satcom Space and Ground Segment Products and Commercial Satcom Applications
- ARTES 5: Technology
- ARTES 20: Integrated Applications

and specific Mission/System orientated Programme Elements

- ARTES 8: Alphabus/Alphasat
- ARTES 11: Small GEO platform/mission
- ARTES 7: EDRS
- ARTES 10: Iris
- ARTES 21 Sat-AIS

Content

- ARTES
- ARTES 3-4 Satcom Applications
- ARTES 20 (IAP) Feasibility Studies
- ARTES 20 (IAP) Demonstration Projects
- What are the opportunities
- How to get involved in ARTES Applications
- Overview of IAP activities with A involvement
- Overview of completed/running IAP activities

ARTES – Advanced Research in Telecommunication Systems

ARTES Objective

- **Objectives**
  - Maintain and improve the capability and **competitiveness** of industry of participating countries in the **world** satellite satcom **market**
  - Develope satellite-based Solutions that meet the needs of the European Society and European Institutions.

- **ARTES is a «frame» programme which hosts different Elements and each of these Elements has a set of specific objectives and conditions**

The ARTES programme as of today

A balanced combination of generic envelope programme Elements

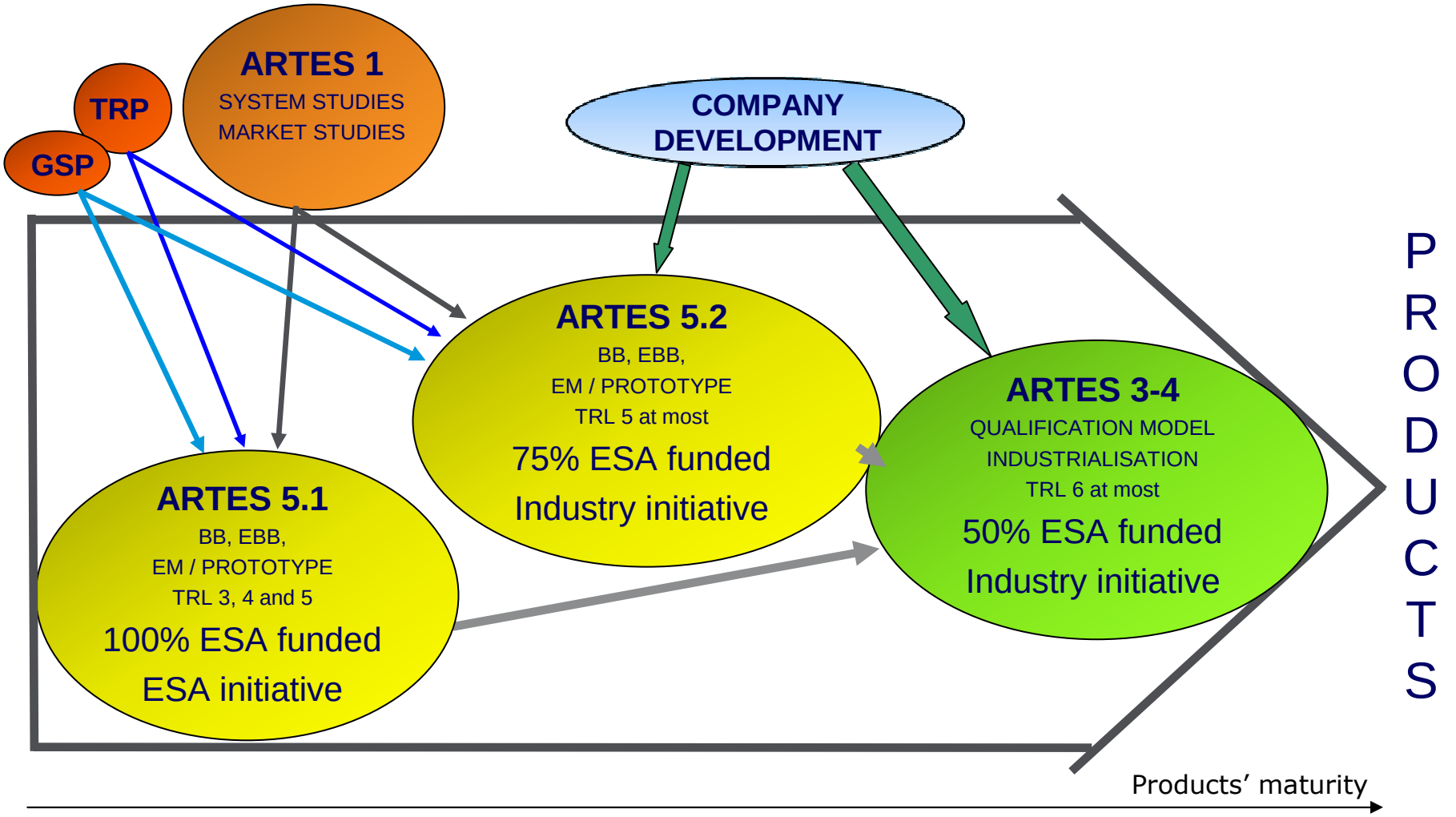
- ARTES 1: Preparatory
- ARTES 3-4: Satcom Space and Ground Segment Products and Commercial Satcom Applications
- ARTES 5: Technology
- ARTES 20: Integrated Applications

and specific Mission/System orientated Programme Elements

- ARTES 8: Alphabus/Alphasat
- ARTES 11: Small GEO platform/mission
- ARTES 7: EDRS
- ARTES 10: Iris
- ARTES 21 Sat-AIS

ARTES 3-4 Satcom Applications

Industry Products Development
"The ARTES products' ecosystem"



GSP: General Studies Programme
TRP: Technology Research Programme
ARTES: Advances Research in TElecommunications Systems

ESA's Telecom Products Programme (ARTES 3-4)

The goal :

Maintain and improve the capability and competitiveness of the industry in the world satellite telecommunication market.

Ensure the short-term readiness of the industry to respond to commercial opportunities by focusing the ARTES 3- 4 activities on products ready for the commercial or institutional market.

Incubator of Products

ARTES Satcom Applications (part of ARTES 3-4)

Satcom Applications, together with Space and Ground Terminals, is part of the three segments addressed by the ARTES 3-4 Programme Element

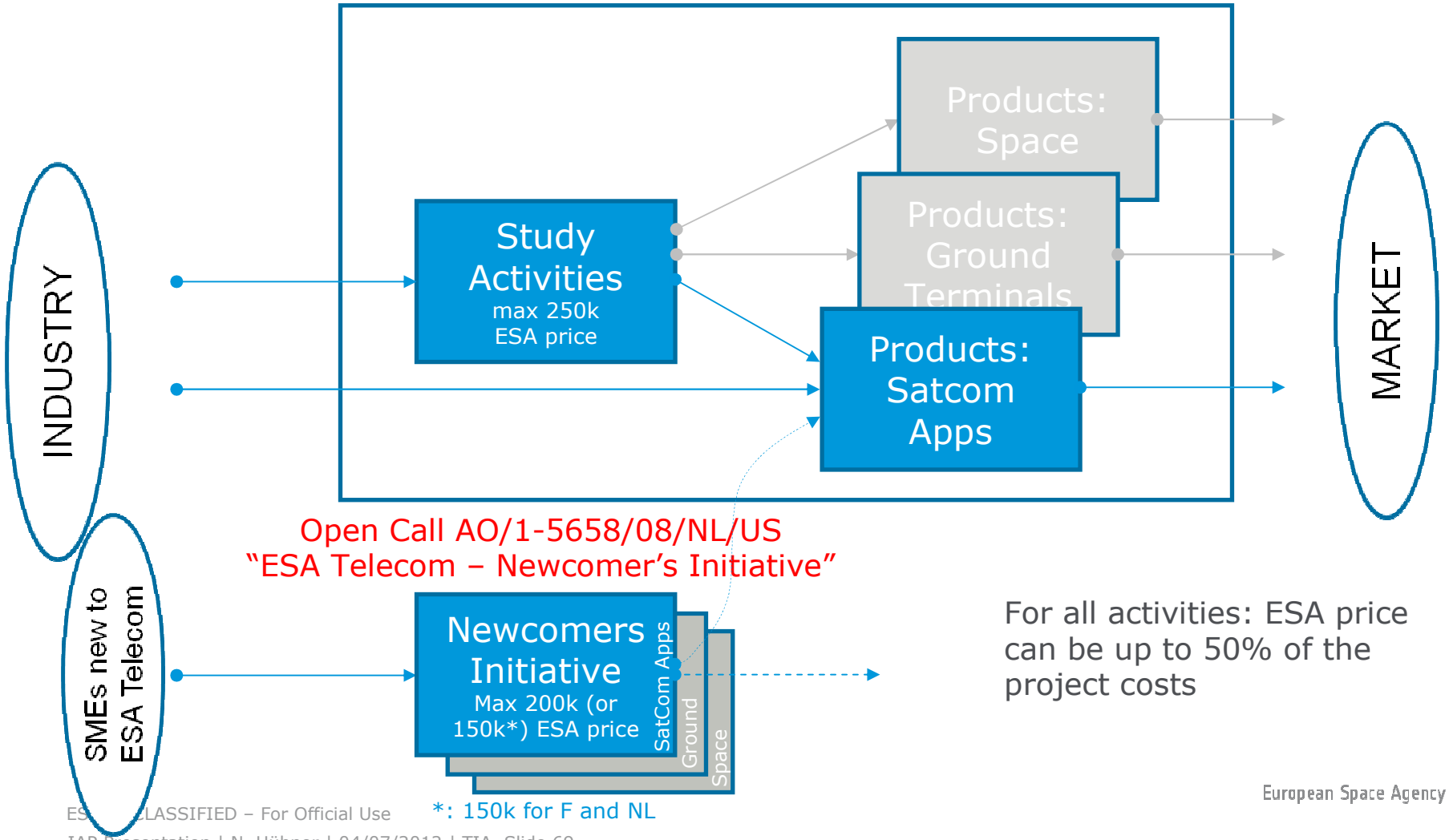
ARTES 3-4 Satcom Applications is a well consolidated(*) instrument used since 1997 to support applications activities promoting utilisation of satellite communications

(*) A total of 154 projects has been launched in the period 1997-2011, for a total funding (ESA part) of about 110 MEUR.

66% of the projects contracted to Small and Medium Enterprises
~50% of the projects contracted to new entrant into ESA Telecom

ARTES 3-4 – Commercial Satcom Applications

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



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

ARTES 3-4 – Commercial Satcom Applications
AO 5891 – Product Development

- Development, integration and pilot utilisation of **Satcom based applications**
- Ideas originated by Industry (industry driven)
- Technical part and business case equally important
- Outline Proposal ⇒ Full Proposal
- Direct negotiation, funded up to 50%
- **Letter of authorisation from National Delegations**
- Part of the Continuous Open Call for ARTES 3-4 (AO 5891) (together with Space and Ground Segment)

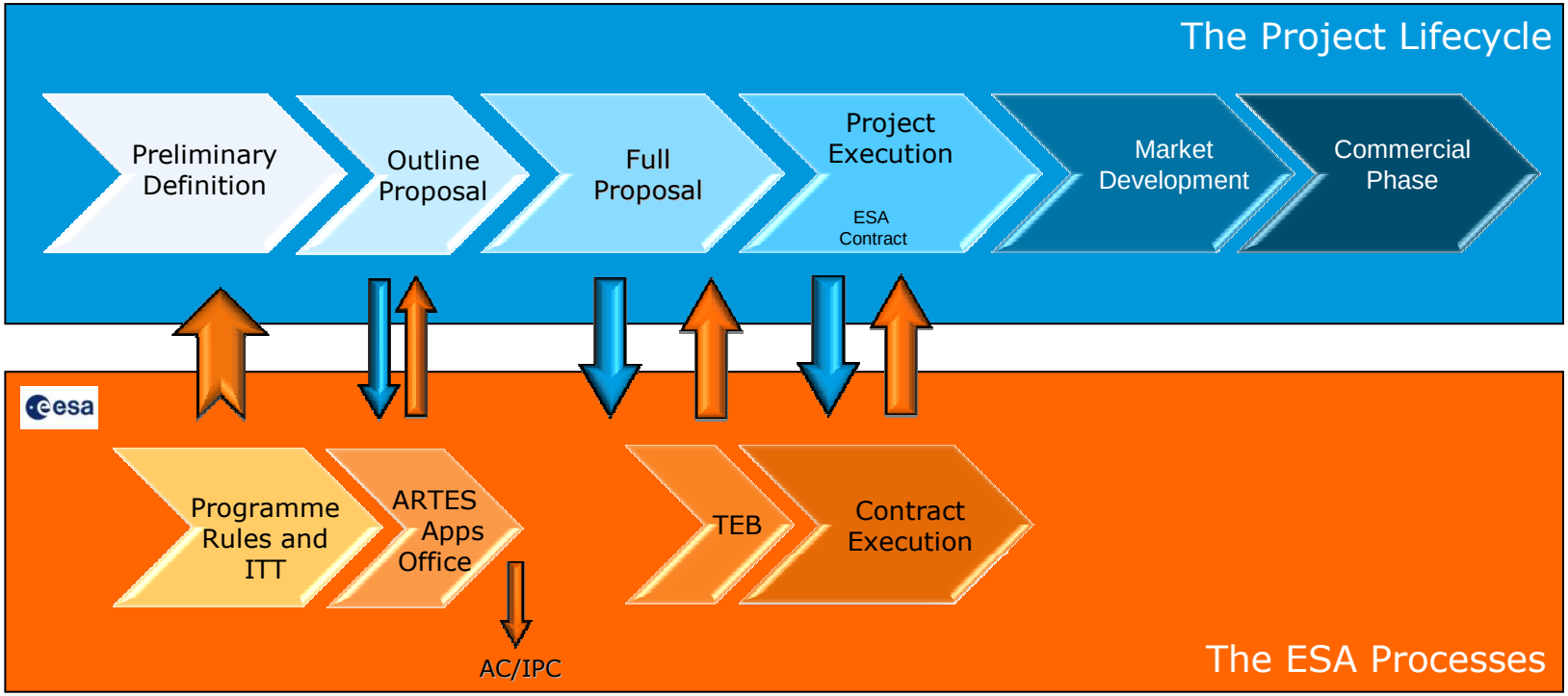
ARTES 3-4 – Commercial Satcom Applications
AO 5891 – Study Activity

- Objective: perform preparatory work and establish key documents for the development of a product for SatCom
- Option just recently introduced for SatCom Apps (Apr2012)
- Tenderer shall have firm plans to develop the product in an ARTES 3-4 Development Activity following the Study Activity. The follow-on activity shall be planned to develop the product (Space, Ground or Satcom Apps) to the level that it is ready for commercial exploitation
- Scope: consolidate the technical requirements and baseline and identify technical risks before entering into the development of a product
- ESA funding not exceeding 50% of the cost (max 250 kEuro)
- Outline proposal OPTIONAL (but highly recommended!)
- Info on how to apply can be found in the documentation of the 'Continuous Open Call for ARTES 3-4 Proposals in EMITS **http://emits.esa.int:** AO 5891,

ARTES 3-4 – Newcomers Initiative AO 5658

- Objective: attract and assist Small and Medium Enterprises (SMEs) with special attention to companies which never had a contract with ESA Telecom
- Development, integration and pilot utilisation of **Satcom based applications**
- Ideas originated by Industry (industry driven)
- First step: Outline Proposal of about 4 pages (business opportunity, role of Satcom, proposed solution, project content, company background, cost/ price, duration, contact information, SME status) via a secure website **http://telecom.esa.int/newcomers**
- Second step: Full Proposal according to Continuous Open Call AO 5658
- Direct negotiation, funded up to 50% (max. 200 kEuro)
- **Letter of authorisation from National Delegations**
- Difference to ARTES 3-4: easy entry, reduced application requirements, more support from ESA, business case as part of the project, funding ceiling of 200 kEuro

ARTES 3-4
Project Lifecycle & ESA Processes

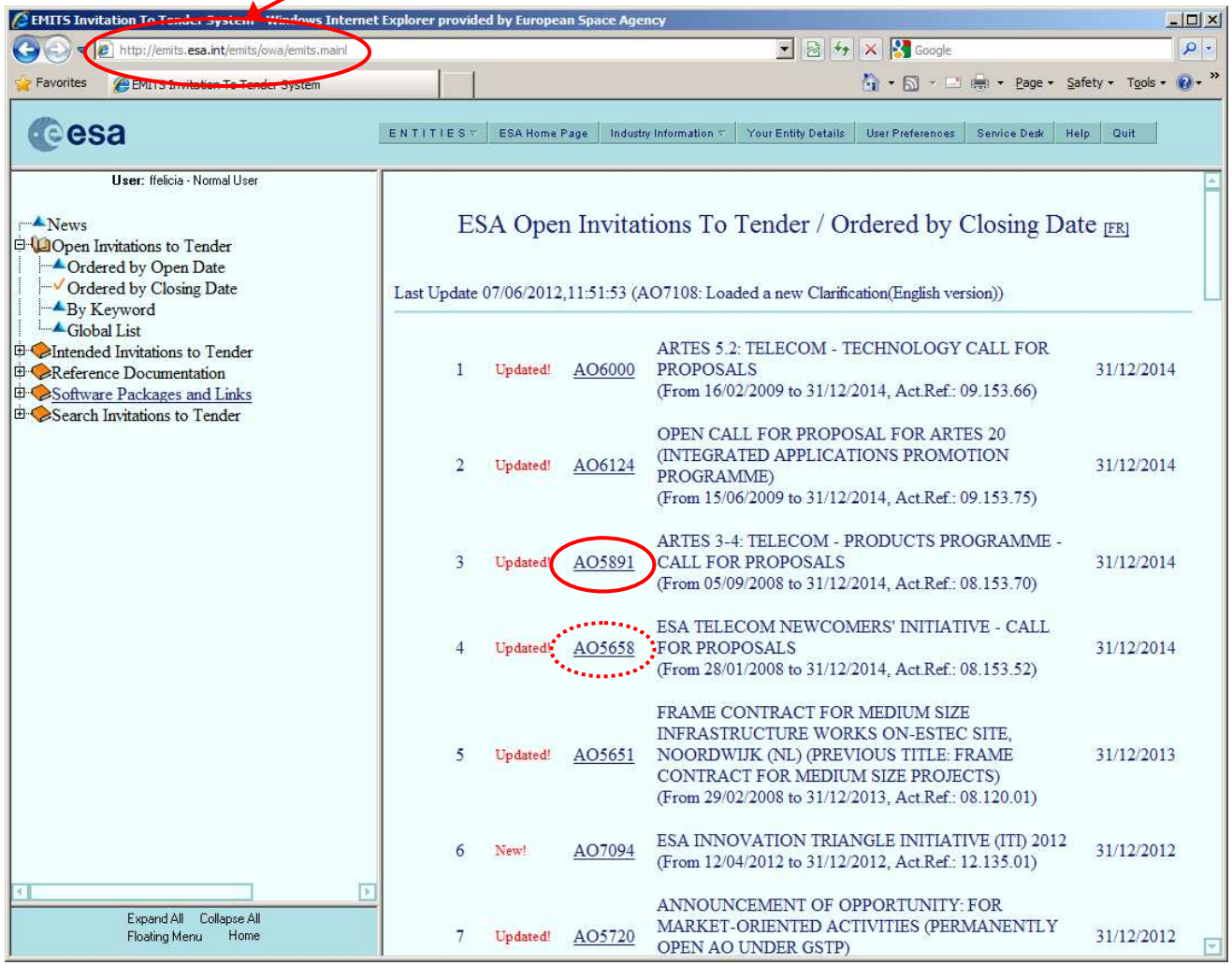


ESA Boards & Committees ➔

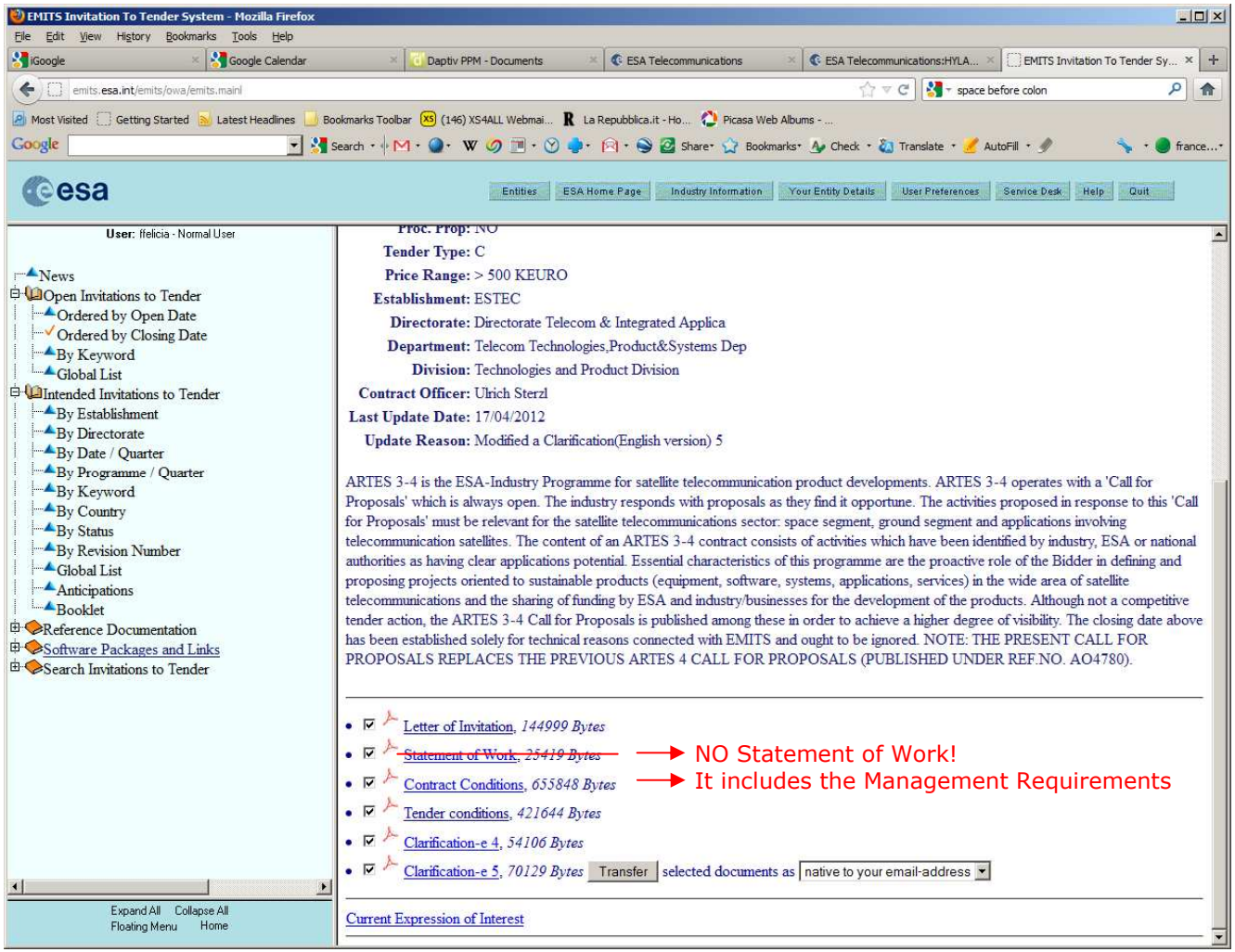
AC: Adjudication Committee (price>250k)
IPC: Industrial Policy Committee (price>500k)
TEB: Tender Evaluation Board

How to apply (1)

ESA EMITS: http://emits.esa.int



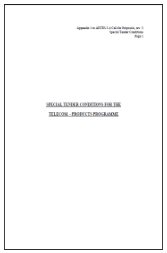
How to apply (2)



How to apply (3)

- Invitation Letter

- Special Tender Conditions



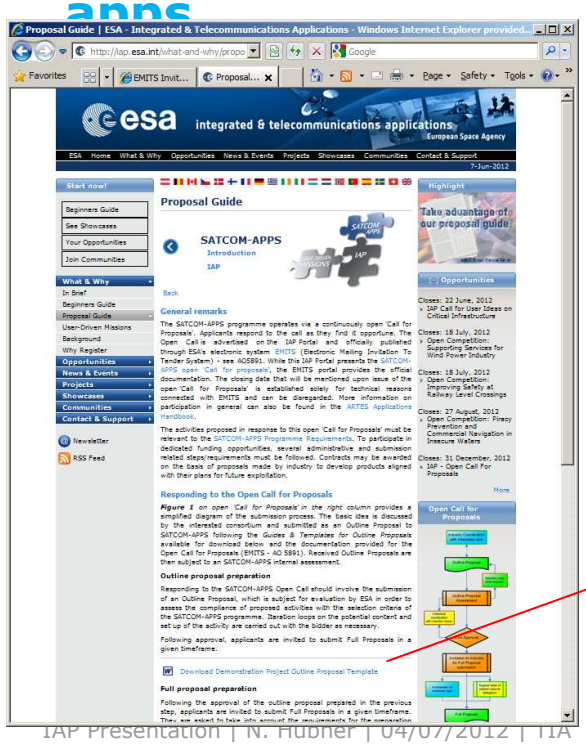
=> How to prepare the outline proposal and the full proposal

- Draft Contract
  - Management Requirements
    - Study Activities
    - Ground Segment Activities
    - Space Segment Activities
    - Satcom Applications

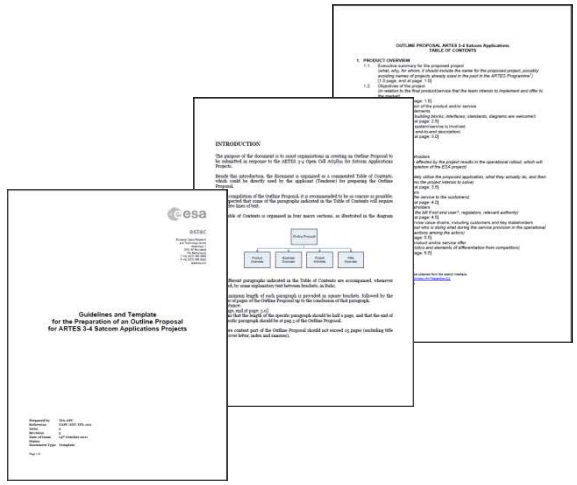
=> How to organise the work and its deliverables

How to apply (4)

1. To facilitate the preparation of the Outline Proposal for ARTES 3-4 SatCom Apps Projects, a Guideline Template has been prepared
2. The template is a MS Word document that can be used as a starting point to fill in the content of the Outline Proposal
3. The Template can be accessed from: **http://iap.esa.int/what-and-why/proposal-guide/satcom-apps**



Outline Proposal Guideline Template



ESA Satcom Operators Initiative (1)

- As part of the Special Tender Conditions, Par.5.16 of the section "Content of the Full Proposal for SatCom Applications", the possibility to access SatCom capacity and services at preferential conditions is indicated

- This option is conceived to help new ARTES SatCom Apps projects, especially when generated by new entrants in the space domain, to find the "right" Satcom solution fitting their technical, operational and commercial requirements

- Frequent obstacles are the lack of technical know-how in the ARTES Project team and the sometime unclear offers from the markets

- Apps projects have typically low scale deployments, which make them not particularly attractive for Satcom solution providers, in particular when specific technical issues need to be addressed

- The ESA-Satcom Operators initiative has been introduced to answer the above points

ESA Satcom Operators Initiative (2)

Formal agreement between ESA and the Satcom Operator guarantees the following undertakings:

1)A set of privileged conditions to access the satellite capacity for the duration of the ESA project (free, or discounted fees)
2)Structured access to technical, operational and commercial information to support the applicants' proposal
3)Dedicated support during the preparation of the proposal and the execution of the project

Current Agreements:

Satcom Operator	Satellites	Provision	Status
Avanti	HYLAS 1	Raw Capacity, Managed IP Access Services	Operational telecom.esa.int/hylas1apps
SES Broadband Services	Astra 23.5° East	Managed IP Access Services	In preparation

ESA Satcom Operators Initiative (3)

HYLAS 1 Opportunity:

A single Ku European beam suitable for DTH TV, HDTV and Multicast services.

Uplink frequency bands	17.3-18.1GHz
Downlink frequency bands	11.7-12.5GHz
Service areas	Western Europe

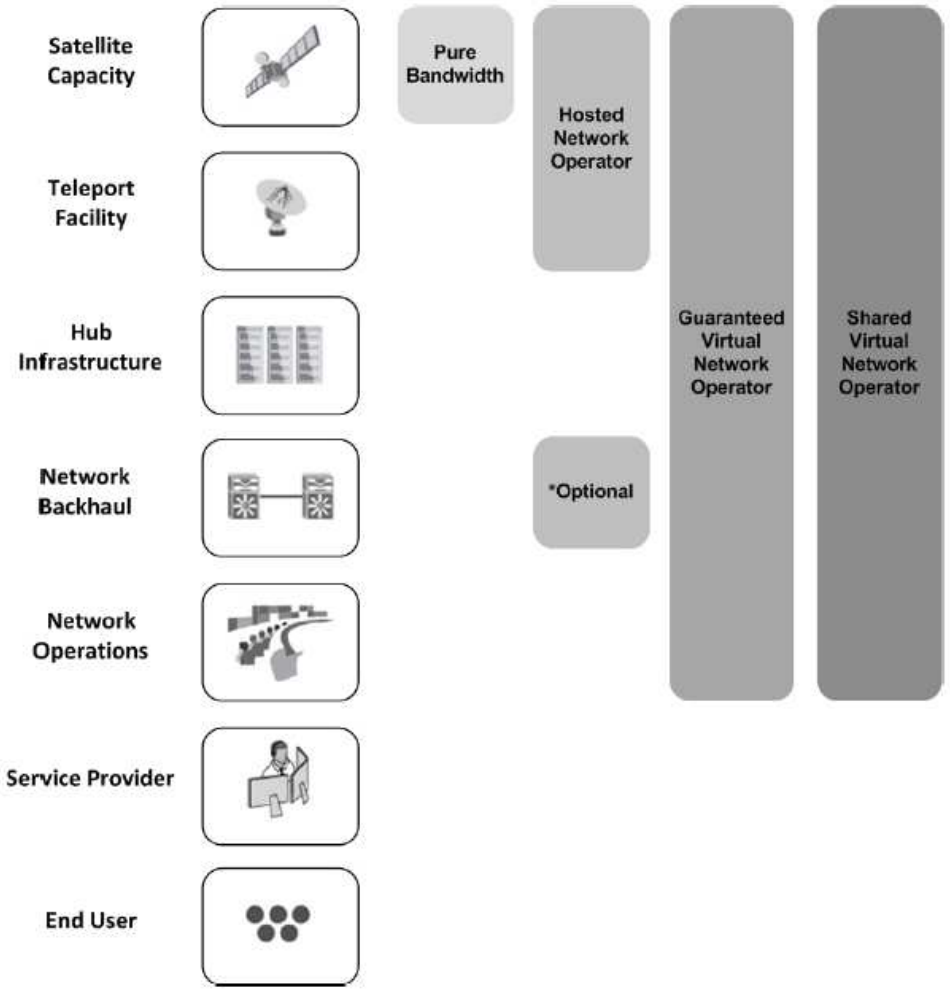
Up to eight Ka spot beams capable of serving broadband, interactive TV services as well as HDTV.

Uplink within	27.5 - 30.0 GHz
Downlink within	18.1 - 20.2 GHz
Service areas	Western Europe

ESA Satcom Operators Initiative (4)

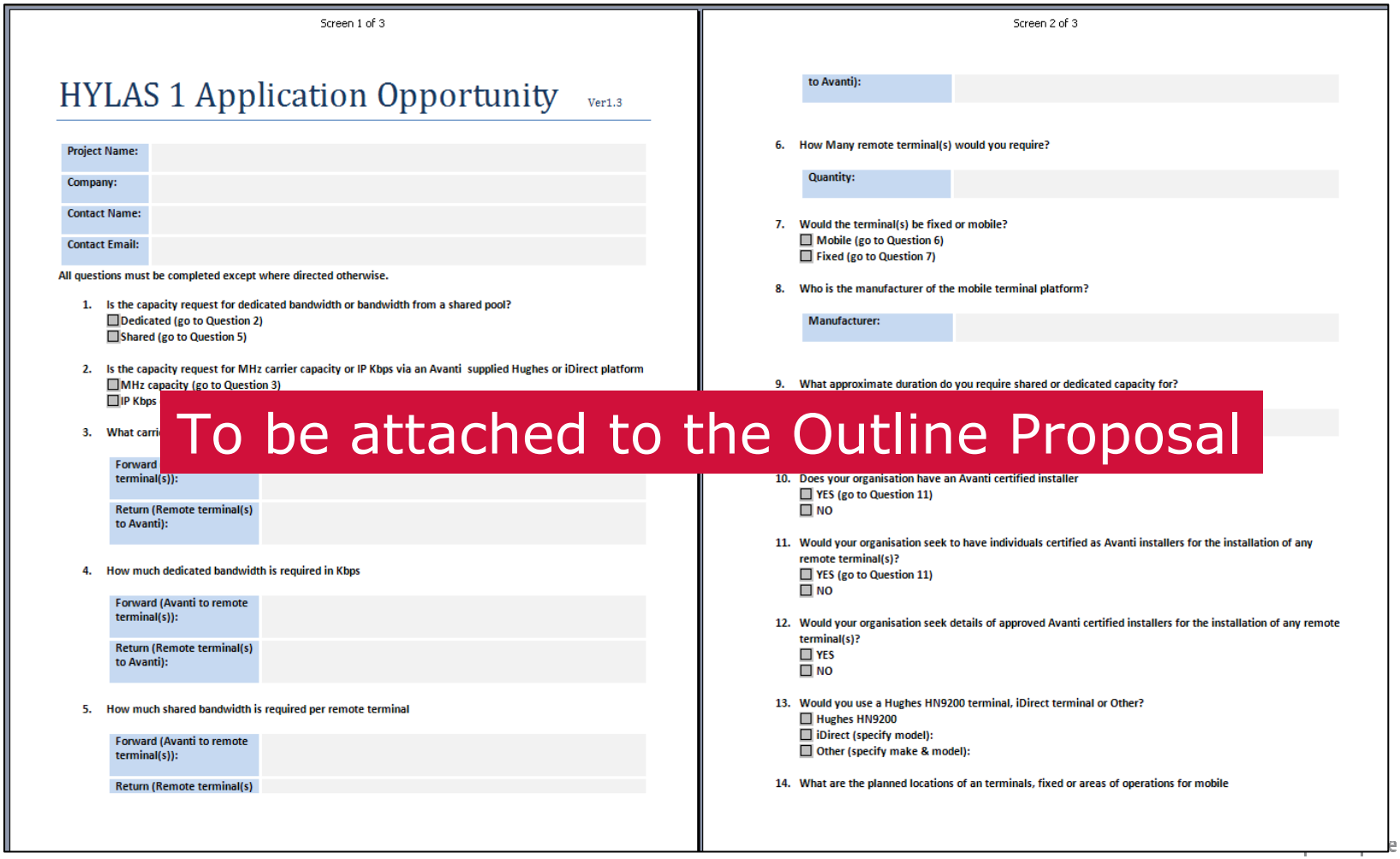
HYLAS 1

Opportunity: what is offered
at NO COST for
ARTES 3-4 and
ARTES 20 Projects



ESA Satcom Operators Initiative (5)

HYLAS 1 Capacity Request Template



Screen 1 of 3

HYLAS 1 Application Opportunity Ver1.3

Project Name:	
Company:	
Contact Name:	
Contact Email:	

All questions must be completed except where directed otherwise.

1. Is the capacity request for dedicated bandwidth or bandwidth from a shared pool?
   - ☐ Dedicated (go to Question 2)
   - ☐ Shared (go to Question 5)
2. Is the capacity request for MHz carrier capacity or IP Kbps via an Avanti supplied Hughes or iDirect platform
   - ☐ MHz capacity (go to Question 3)
   - ☐ IP Kbps
3. What carri

Forward terminal(s)):	
Return (Remote terminal(s) to Avanti):	

4. How much dedicated bandwidth is required in Kbps

Forward (Avanti to remote terminal(s)):	
Return (Remote terminal(s) to Avanti):	

5. How much shared bandwidth is required per remote terminal

Forward (Avanti to remote terminal(s)):	
Return (Remote terminal(s)	

Screen 2 of 3

to Avanti):	

6. How Many remote terminal(s) would you require?

Quantity:	

7. Would the terminal(s) be fixed or mobile?
   - ☐ Mobile (go to Question 6)
   - ☐ Fixed (go to Question 7)
8. Who is the manufacturer of the mobile terminal platform?

Manufacturer:	

9. What approximate duration do you require shared or dedicated capacity for?
10. Does your organisation have an Avanti certified installer
    - ☐ YES (go to Question 11)
    - ☐ NO
11. Would your organisation seek to have individuals certified as Avanti installers for the installation of any remote terminal(s)?
    - ☐ YES (go to Question 11)
    - ☐ NO
12. Would your organisation seek details of approved Avanti certified installers for the installation of any remote terminal(s)?
    - ☐ YES
    - ☐ NO
13. Would you use a Hughes HN9200 terminal, iDirect terminal or Other?
    - ☐ Hughes HN9200
    - ☐ iDirect (specify model):
    - ☐ Other (specify make & model):
14. What are the planned locations of an terminals, fixed or areas of operations for mobile

To be attached to the Outline Proposal

e Agency

How to apply – Checklist

1. Register to ESA EMITS at emits.esa.int (to get access to ITT documents)
2. Between the two possibilities:
   a. AO5891 "ARTES 3/4: TELECOM - PRODUCTS PROGRAMME" Satcom Applications section
   b. AO5658 "ESA Telecom – Newcomer's Initiative"

   select the most suitable for your project idea *(if you do not know, call us!)*
3. Prepare a concise concept paper (one-two pages) that you could share with ESA if you wish so; contact the relevant National Delegation(s) [countries of prime and subs] to get feedback on their potential support. Contact points are available at: **http://iap.esa.int/delegates**
4. If feedback of 3. is OK, prepare the Outline Proposal in line with applicable ITT documents (either ARTES 3-4 Satcom Applications Study, Satcom Applications Development or Newcomers Initiative). Guidelines and Template docs to support the preparation of the Outline Proposal are available
5. In case you want to apply for the special access to SatCom capacity and services at preferential conditions, clearly indicate this in the Outline Proposal
6. Submit the Outline Proposal in accordance with what is indicated in the ITT

ARTES 3-4 Full Proposal (1)

1. Content of the Full Proposal is indicated in the Special Conditions to Tender
2. Structure of the Full Proposal: i) Cover Letter, ii) Technical Proposal, iii) Financial Management and Administrative Proposal
3. Include letter of Avanti confirming agreement for access to HYLAS 1 capacity (if this option is chosen)
4. The Business Plan can be either included in the Technical Proposal, or provided as a Separate Volume (if confidential for subcontractors)
5. General points to be noted:
   a. Registration with ESA (EMITS) is necessary for obtaining a Bidder Code without this code no contract can be placed
   b. Expenses incurred in the preparation of the outline or full proposal will not be reimbursed
   c. Intellectual Property Rights (IPRs):
      - IPRs remain with the Contractor
      - ESA licence limited to the use of IPR required to fulfil the objectives of the Contract
      - Protection of background know how, if applicable
      - No royalties to ESA

ARTES 3-4 Full Proposal (2)

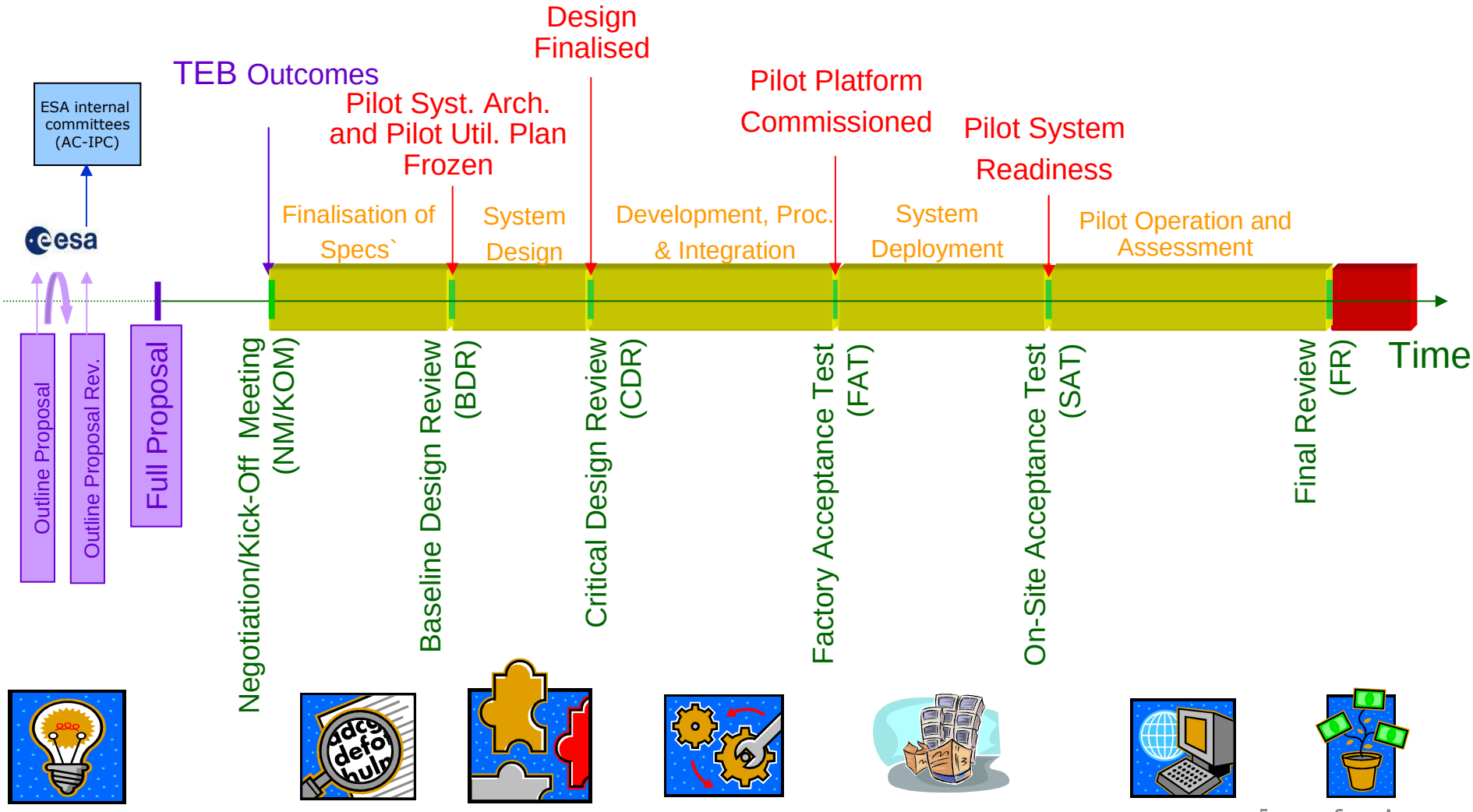
Do:

1. Provide a sound justification for the choice of technology
2. Provide a clear list of deliverables
3. Clarify roles and responsibilities of partners (e.g. subcontractors) in the industrial team (each subcontractor should be responsible for at least one WP)
4. Provide a clear list of inputs, tasks and outputs for each Work Package (WP). Outputs shall be **S**pecific **M**easurable **A**greed **R**elevant **T**ime bounded
5. Include an explanation of the used acronyms and abbreviations where necessary
6. Include a short presentation of the company(ies), going straight to the key points (e.g. products/business, key customers, previous related experience, size, organisation, key financial figures)

Do not:

1. Spend too much on presenting and discussing the background scenario
2. Leave space to interpretation as it can generate wrong expectations within the contractual team and ESA
3. Correlate quality of proposal with number of pages (be concise!!!)

ARTES 3-4 – Project Logic



ESA's Integrated Applications Promotion Programme (ARTES 20)

ESA's Integrated Applications Promotion Programme (ARTES 20)

The goal :

Foster new utilization of existing space capacity and capability, in close partnership with end-users, through the development of integrated (different space and non space technologies) applications projects which demonstrate a potential for sustainable services.

Addressing global challenges in different thematic areas:

Space for: Health, Development, Transport, Security, Safety, Energy, Innovation ...

ESA's Integrated Applications Promotion Programme (ARTES 20)

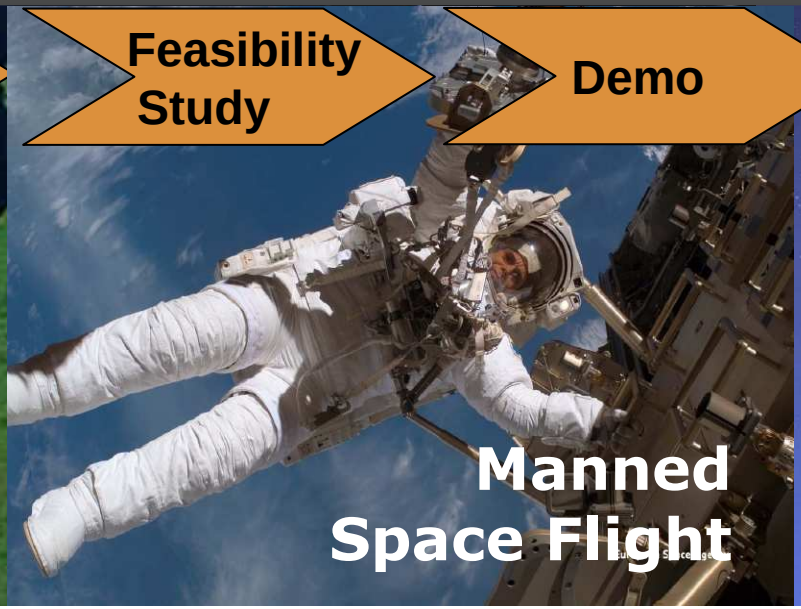
➔ Developing new services for new user communities

User Demand

Feasibility Study

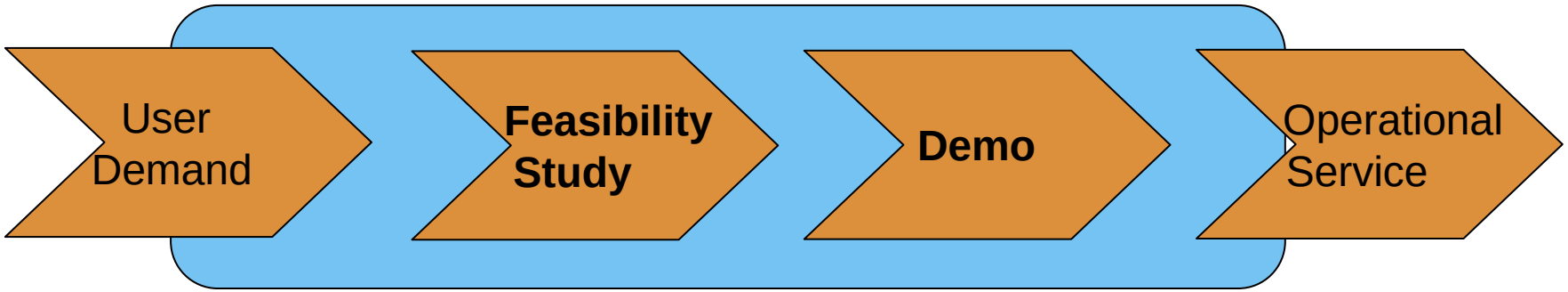
Demo

Operational Service



ESA's Integrated Applications Promotion Programme (ARTES 20)

ESA IAP Involvement



User with demand but no contact to industry

Contact with ESA:

- iap.esa.int
- conferences
- ambassadors
- call for user ideas

Funding by ESA:

- 100% - ESA initiated activities in close collaboration with users / stake-holders
- 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 20 – Integrated Applications

- Development, integration and pilot utilisation of **Integrated Applications based on several space assets**
- **User driven activities aiming for sustainable services**
- Feasibility Studies & Demonstration Projects
- A) Ideas originated by ESA in collaboration with users
  => Specific Open Competitive Tenders (ITT)
  => fully funded
- B) Ideas originated by Industry in collaboration with users
  => Continuous Open Call for Proposals (AO 6124)
  => Outline Proposal ⇒ JCB Approval ⇒ Full Proposal
  => co-funded
- **Letter of authorisation from National Delegations**

Feasibility Studies
(fully funded and co-funded)

User involvement as starting point for every IAP activity

-Proof of interest and involvement of users/stakeholders is required for any IAP activity (feasibility studies and demonstration projects)

-Open competitive tenders (fully funded):

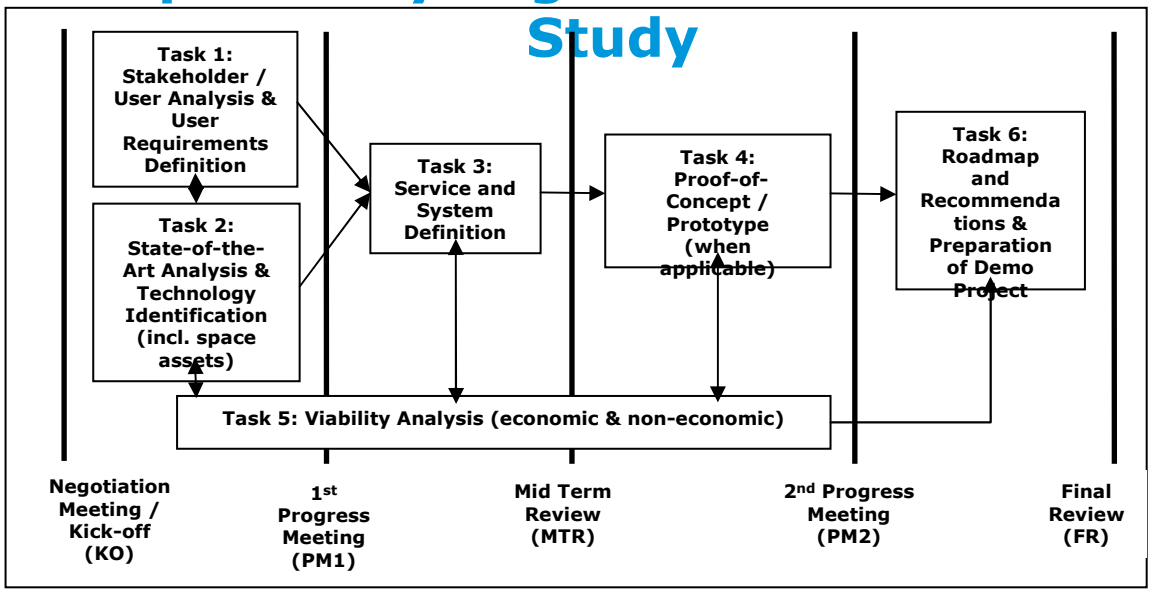
Expressions of Interest to be attached to the proposal including:
- information on the motivation of the user organisation to participate
- confirmation of active contribution to several tasks (i.e. user needs, validation of the user requirements, information on existing services and operational procedures, validation of specifications of services and solution,
contribution to the validation of the Proof of Concept, contribution to the implementation roadmap

-Direct negotiation activities (co-funded):

Expressions of Interest to be attached to the Outline Proposal including:
- information on the motivation of the user organisation to participate
- information how they intend to contribute to the study and to which tasks,
- for Feasibility Studies: information if they are interested to engage in a potential follow-on demo project in case of successful study outcome
- for Demo Projects: information if the consider to subscribe to operational services in case of successful completion of the demonstration project

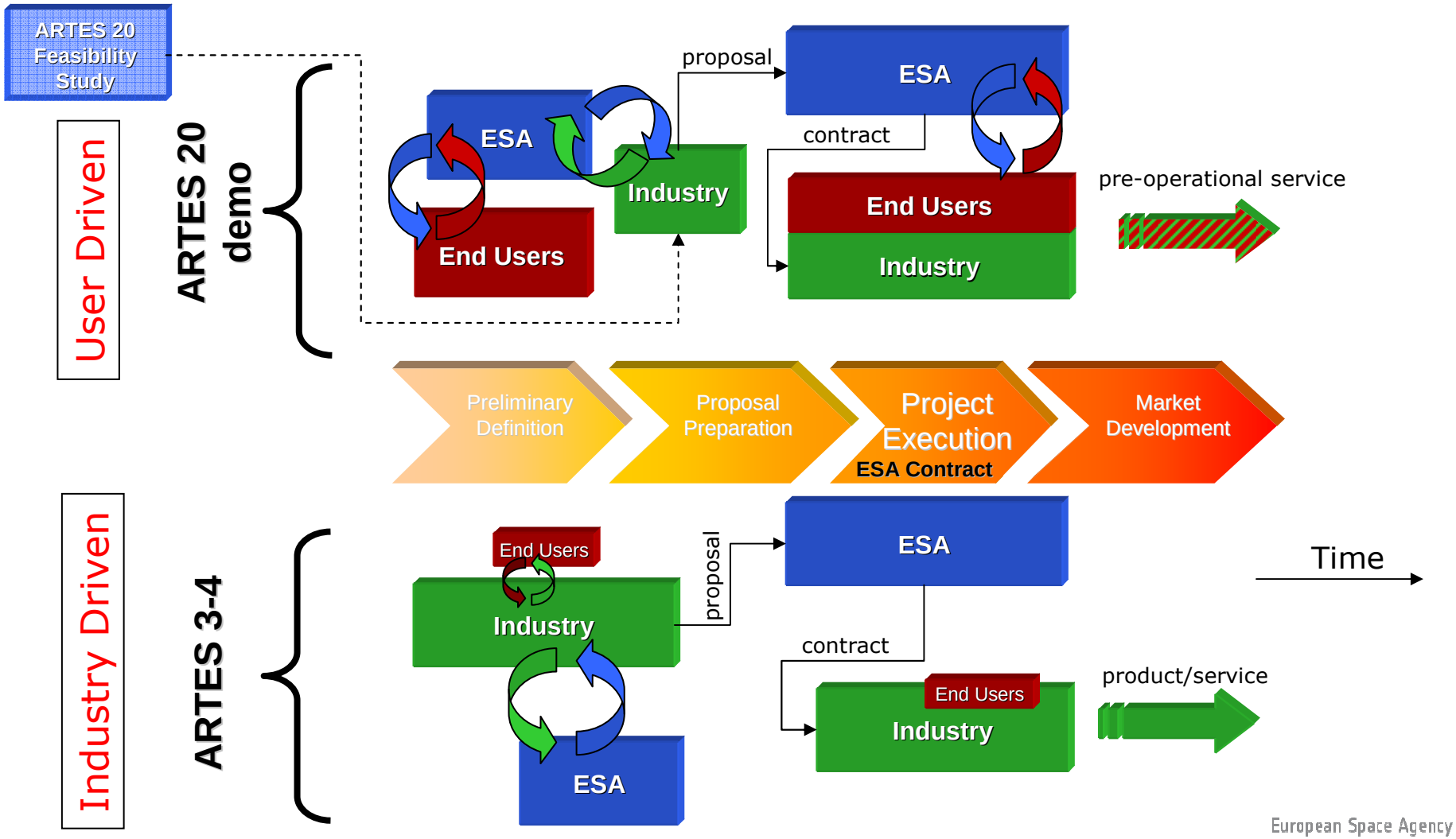
Feasibility Studies
(fully funded and co-funded)

Principle Study Logic of an IAP Feasibility Study



- Task 1 – consolidating the interest of the related stakeholders and users, analysing their needs and defining the user requirements,
- Task 2 – performing a state-of-the-art analysis of the different existing technological solutions (both space and terrestrial based)
- Task 3 – defining the services and the service value chain, generating the specifications and architecture of the related system
- Task 4 – proving the feasibility of critical technical and non-technical elements of the system and/or of parts thereof (Proof of Concept) in collaboration with the users
- Task 5 – analysing the economic and non-economic viability of the services and the associated system,
- Task 6 – preparing the roadmap for the further implementation of the system and its associated services (e.g. via a demonstration project), securing the involvement of users/stakeholders

Demonstration Projects (fully funded and co-funded)



Demonstration Projects (fully funded and co-funded)

	ARTES 3-4	ARTES 20 demo
scope of work	satcom based applications	applications using multiple space assets (min: 2)
originator	industry (incl. service providers)	end users, in association with industry where applicable
pilot utilisation phase	with end users in their operational environment	with end users in their operational environment
complete business plan	yes	yes for commercial services, simplified for institutional services
price	50% of the eligible costs	50% of the eligible costs

ESA's Integrated Applications Promotion Programme (ARTES 20)

What are the opportunities?

What are the opportunities? (1)

1. Competitive tenders (feasibility studies):

Currently Open Tenders

-Improvement of the Safety at Railway Level Crossings (FS): AO 7147
tender open from 9 May until 18 July 2012

-Supporting Services for Wind Power Industry (FS): AO 7148
tender open from 9 May until 18 July 2012

-Piracy Prevention and Commercial Navigation in Insecure Waters (FS): AO 7168
tender open from 4 June until 27 August 2012

-Improved Alpine Avalanche Forecast Service (FS): AO 7213
tender open from 28 June until 20 September 2012

Intended Tenders

-Improving Disaster Response Capacity (FS): July 2012

-e-Health for Sub-Saharan Africa – IV: Sustainability (FS): September 2012

-Safety and Information Services for Ski Resorts (FS): September 2012

-Improved Situational Awareness in the Arctic (FS): October 2012

-Improving the Efficiency of Loss Adjustment and Claims Management in the Insurance Industry (FS): October 2012

-Maintenance and Recovery of High Voltage Electricity Transport Systems (FS): October 2012

Information to be found on the IAP website (announcements): iap.esa.int and on ESA's electronic tendering system (tender documents): emits.esa.int

What are the opportunities? (2)

2. Continuous Open Call for proposals for Feasibility Studies and Demonstration Projects (AO 6124)

Beginner's Guide and **Proposal Guides** on IAP website for IAP, SATCOM-APPS, SAT-AIS including:

- Administrative Guide
- Outline Proposal Guidelines Feasibility & Demo
- Process Flowcharts

accessible under **http://iap.esa.int/what-and-why/proposal-guide/iap**

3. Initiatives in preparation:

-User Call on Critical Infrastructures (transport, energy, food, etc): closed 30 June
http://iap.esa.int/opportunities/iap/critical-infrastructure-call-for-user-ideas

-Activities triggered by new Italian Ambassador Platform on 'Dual Use Applications'

-New Ambassador Platform (NL) on 'Water Management' in preparation

Related information can be found on the IAP website: iap.esa.int

ESA offers …

- **Financial support** in the co-funded programmes ARTES 20 (Integrated Applications Promotion) and ARTES 34 (Satcom Applications)
- **Consultancy** from idea generation until introduction of a sustainable application / service
- **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 international acknowledged organisation

ESA expects applicants 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 … may be, 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 programs (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

How to get involved in an IAP activity

ESA's Integrated Applications Promotion Programme (ARTES 20)

Selection criteria for an IAP activity:

- **Strong user needs, interest & involvement**
- **Utilisation of two or more space assets**
- Evidence of a **clear added value**
- **Potential for sustainability**
- **Strength in background and experience** (credibility) of the bidding team with respect to proposed activity
- **Funding mainly for space** related activities
- And for Demonstration Projects:
  Need for and the representativeness of the future service (incl. scalability).

ESA's Integrated Applications Promotion Programme (ARTES 20)

Ideal characteristics of involved parties:

- **User:**
  - representing / leading broader markets (champion)
  - enabling the market access
  - communicator to spread the message
  - open for new solutions
  - willing to engage as stakeholder or customer
- **Service provider:**
  - familiar with the market (already in the market)
  - provider of operational services (24/7)
  - various technologies to address the specific user demand
- **Industrial team:**
  - strong leadership and good management
  - right mix of know-how (completeness of the team)

ESA's Integrated Applications Promotion Programme (ARTES 20)

Ideal know-how / composition of consortium (depending on the subject):

- Earth Observation value adding services
- GIS & mapping services
- In-situ sensors & data collection
- Satcom products & service provisioning
- GNSS products and service provisioning
- Subject specific expertise
- Data fusion & modelling
- Service provisioning in the subject area
- Commercial expertise

ESA initiated Activities (fully funded)
Mainly Feasibility Studies

How to participate in Open Competitive Tenders:

- After publication, ESA is not allowed to communicate with industry about the subject of the tender in order not to disturb the competition
- Organisation of a consortium is initiated by industry:
  - Either you start organising your own consortium
  - Or you try to get involved with another consortium
- If you are not known to other companies you will not be approached
- EMITS offers the opportunity to announce the interest for collaboration and to provide information on the expertise
- It can be expected that industries providing similar services or have engaged in similar development activities in the past are interested to submit a bid ⇒ search for projects on similar / related subjects on ESA websites

Partner/industry initiated Activities (co-funded)
Feasibility Studies or Demonstration Projects

How to prepare for Direct Negotiation Activities (1): Outline Proposal

- Ruling document for Outline and Full Proposals is the continuous "Open Call for Proposals for Feasibility Studies and Demonstration Projects":
  http://emits.esa.int Open Invitations to Tender **AO 6124**
- Submission of an Outline Proposal to email address:
  iap@esa.int
- Beginner and Outline Proposal guidelines already on IAP website; related update of AO 6124 on EMITS by end March 2012
- ESA assessment and iteration on promising ideas **together with bidder**
- Coordination with **national delegations** necessary
- Insertion in the rolling IAP workplan for **approval by IAP Member States (JCB: 4x per year)**

Partner/industry initiated Activities (co-funded)
Feasibility Studies or Demonstration Projects

How to prepare for Direct Negotiation Activities (2): Full Proposal

- After approval, invitation to submit a full proposal
- Full proposal to be prepared according to requirements of 'Open Call for Proposals (AO 6124) including letters of authorisation of the related national delegations (early coordination process recommended)
- Submission of the Full Proposal triggers the ESA evaluation process
- If the proposal contains major non-compliances clarification iterations will be initiated with the bidder(s)
- When the proposal is considered compliant, the negotiation process will be initiated

Proposal preparation
(fully funded and co-funded)

Points to pay attention to:

- Often it is asked to provide a **first iteration** of specific tasks already within the proposal: this should include information on the actual starting point of the activity and an outlook how to bring this task forward within the activity.
- The involvement of the **stakeholders / users** in most of the tasks is indispensable: it needs to be explained how this involvement is done.
- 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 recommendable 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.
- 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

IAP references

- IAP Website: **http://iap.esa.int**
- "Integrated Applications Handbook"
  available as hardcopy and via the IAP website:
  http://iap.esa.int/handbook
- IAP Open Call for co-funded activities online on
  - EMITS: **http://emits.esa.int** (ITT AO6124)
- Information on IAP Open Competitive Tenders online on
  - IAP website **http://iap.esa.int/intended-tenders/all**
  - EMITS at the time of publishing
- IAP general email address: iap@esa.int

Questions?

If you do not know what to do:

Call us!

Thank you

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ESA's Integrated Applications Promotion Programme (ARTES 20)

IAP Activities with Austrian involvement

IAP activities with A involvement (1)

Running:

FAAPS – Fully Automated Aqua Processing Service (DP)
Users: Office of the Styrian Government; Department for fire department and civil protection –
Federal Government of Lower Austria; Ministry of Agriculture and Forestry, Environment
and Water Management - Austria
Consortium: Capgemini Austria (A), Vienna University of Technology (A), GeoVille (A), Capgemini France (F)

SASISA – Small Aircraft Service for Instant Situational Awareness (FS)
Users: Departments of Civil Protection of the State Governments of Steuermark and Lower Austria
Consortium: Knowledge & Analysis Ltd (UK), Diamond Aircraft Industries (A), Joanneum Research (A), JAST (CH)

Optimising Inter-Modal Freight Transport through European Ports (FS)
Users: Mersey Maritime, The Mersey Partnership, Peel Ports, JMD Haulage, Atlantic Container Lines
LUX: GMV (E), Brimatech Services (A), BAe Systems (UK), Teirlog (E), Teleconsult Austria (A)

IAP activities with A involvement (2)

Planned:

Monitoring of Alpine Transport Infrastructure (FS)

Users: SBB – Swiss Federal Railways (CH), OBB – Austrian Federal Railways (A), ASTRA-Swiss Federal Roads Office (CH)

Consortium: Gamma Remote Sensing AG (CH), Graz University of Technology (A)

SELIAT – Safe Emergency Landing In the Alpine Terrain (FS)

Users: Wucher Helicopter GmBH (A), Luftsport Verband Bayern (D), Streckenflug.at (A), Eurocopter (D) (tbc), ÖAMTC (A)

Consortium: University of Salzburg (A), Austrian Academy of Science(A), TeleConsult Austria (A), Brimatech Services (A), DLR (D)

SASISA – Demo Project (DP)

Users: Wucher Helicopter GmBH (A), Luftsport Verband Bayern (D), Streckenflug.at (A), Eurocopter (D) (tbc), ÖAMTC (A)

Consortium: University of Salzburg (A), Austrian Academy of Science(A), TeleConsult Austria (A), Brimatech Services (A), DLR (D)

IAP activities with A involvement (3)

In discussion:

Tactical and Pre-Tactical ATFCM (Air Traffic Flow and Capacity Management) Support by Satellite Applications (FS)

Users: AustroControl (A)

Consortium: AustroControl (A), tbd

G4Real – Enhanced, near real-time Common Operational Picture for radiation/emergency monitoring and mitigation (FS)

Users: THW Berchtesgaden (D), Integrierte Rettungsleitstelle Traunstein (D), Feuerwehr Berchtesgaden (D), Telespazio Deutschland GmbH (D), Facharbeitsgruppe Sicherheit Ainring (D), Department of Civil Protection Province of Tyrol (A), Department of Disaster Management GIS information Integration Province of Upper Austria (A), CBRN School - Civil Protection School Traiskirchen (A)

Consortium: proTime (D), FHG-IML (D), Research Studio Austria Forschungsgesellschaft RSA (A)

Overview of completed / running IAP studies and projects

Space for Health

Feasibility Studies

- VECMAP – Disease Vector Mapping
- PREDICT – Prevent and Respond to Epidemics and Demonstrate Information and Communication Technologies
- GULLIVER - Tracking Pharmaceuticals in Remote Regions
- B-LiFE – Biological Light Field Laboratory for Emergencies
- VOYAGE – Telemedical support in mobile environment

Demonstration Projects

- AMAZON - Real-time satellite-based telemedicine system for professional clinical users in remote locations
- T4MOD - Telemedicine for Medical Operations in Distant areas
- VECMAP Demo Project

Space for Transport

Feasibility Studies

- SSMART: Intermodal transport of hazardous goods
- IRISS: Integrated Railways via Integrated Satellite Services
- Bird Strike Risk Reduction for Civil Aviation
- ITRAQ: Integrated TRaffic management and Air Quality control in cities
- EASY – Easy and safe yachting
- DG-TRAC – Dangerous Goods transport TRACking and tracing in the medical sector
- Intermodal Freight Transport (2x)

Demonstration Projects

- FlySafe – Bird Avoidance for Air Forces (transition to operational service)
- S2BAS – Space Services Benefits in Aviation Systems
- SEMAFORS - Demonstration of Ship Efficiency Monitoring, Weather Forecasting and Optimised Routing Service

Space for Safety and Security

Feasibility Studies

- Satellite Systems and Operations for Unmanned Aerial Systems (UAS)
- Integrating Space Assets for UK Resilience
- Land Border Control
- PIMS - Pipeline Integrity Monitoring using Space Assets
- Space Assets for Demining Assistance (3x)
- SASISA – Small Aircraft Service for Instant Situational Awareness
- Prediction, Monitoring and Alerting of Landslides and Subsidence Affecting the Transport Infrastructure

Demonstration Projects

- Nuclear Safeguard and Verification
- FAAPS - Fully Automated Aqua Processing Service

Space for Energy

Feasibility Studies

- INTOGENER - INTegration of EO data and GNSS-R signals for ENERgy applications
- CSP FoSyS - Concentrating Solar Power Forecast System and Service
- CCS SpaceMon - Carbon Capture and Storage - Integrated Space borne Site Monitoring
- UASatcom – Satellite Services for Exploration and Monitoring

Demonstration Projects

- SpaceGrid – Satellite based services for Power Grids

Space for Environment

Feasibility Studies

- SAVEWATER – Integrated SAtellite-AUV services for sustainable WATER management
- SAMBA - SAtellite Monitoring of the Baltic seA ship emissions

Integrated Applications Promotion
IAP Projects and User Partners

Space for Other Areas (agriculture, fishery, education, …)

Feasibility Studies

- BIOSCOPE – Biodiversity multi-scale Observation Performance Enhancer
- FishSAT - Sustainable Fishing
- Integrated Information System for North Sea Fisheries

Demonstration Projects

- Talking Fields - Integrative Use of Satellite Techniques to Optimise Agricultural Production
- Grapelook - Space Based Services for Water Irrigation Management of Vineyards in South Africa