

# IAP Workshop



# Space for Transport and Logistic

Darmstadt, 03/12/2013  
N. Hübner, ESA - IAP

- Workshop Ziele
- ESA
- ESA Telecom Programm
- IAP Programm

Der Workshop soll dazu beitragen:

- die Teilnehmer mit den Möglichkeiten des “Integrated Applications Promotion” (IAP) Programm der ESA (European Space Agency) vertraut zu machen,
- die Diskussion für verbesserte / zukünftige Anwendungen und Dienstleistungen im Transport- und Logistik-Bereich unter Einbeziehung von Raumfahrttechnologien anzuregen,
- neue Vorschläge und Ideen für existenzfähige Anwendungen und Dienstleistungen zu generieren (z.B. via IAP Machbarkeits-Studien und Demonstrations-Projekte),
- Kontakte und Verbindungen herzustellen zwischen den verschiedenen Interessengruppen des Transport- und Logistik-Bereichs (i.e. Nutzer – Dienstleister – Industrie – Forschungseinrichtungen) mit Vertretern der Raumfahrt (i.e. Industrie – Forschungseinrichtungen – DLR – ESA)

# PURPOSE OF ESA



“To provide for and promote, for exclusively peaceful purposes, cooperation among European states in **space research** and **technology** and their **space applications**.”

## Article 2 of ESA Convention



- Over 40 years of experience
- 20 Member States
- Five establishments in Europe, about 2200 staff
- 4 billion Euro budget (2013)
- Over 70 satellites designed, tested and operated in flight
- 17 scientific satellites in operation
- Six types of launcher developed
- Celebrated the 200th launch of Ariane in February 2011



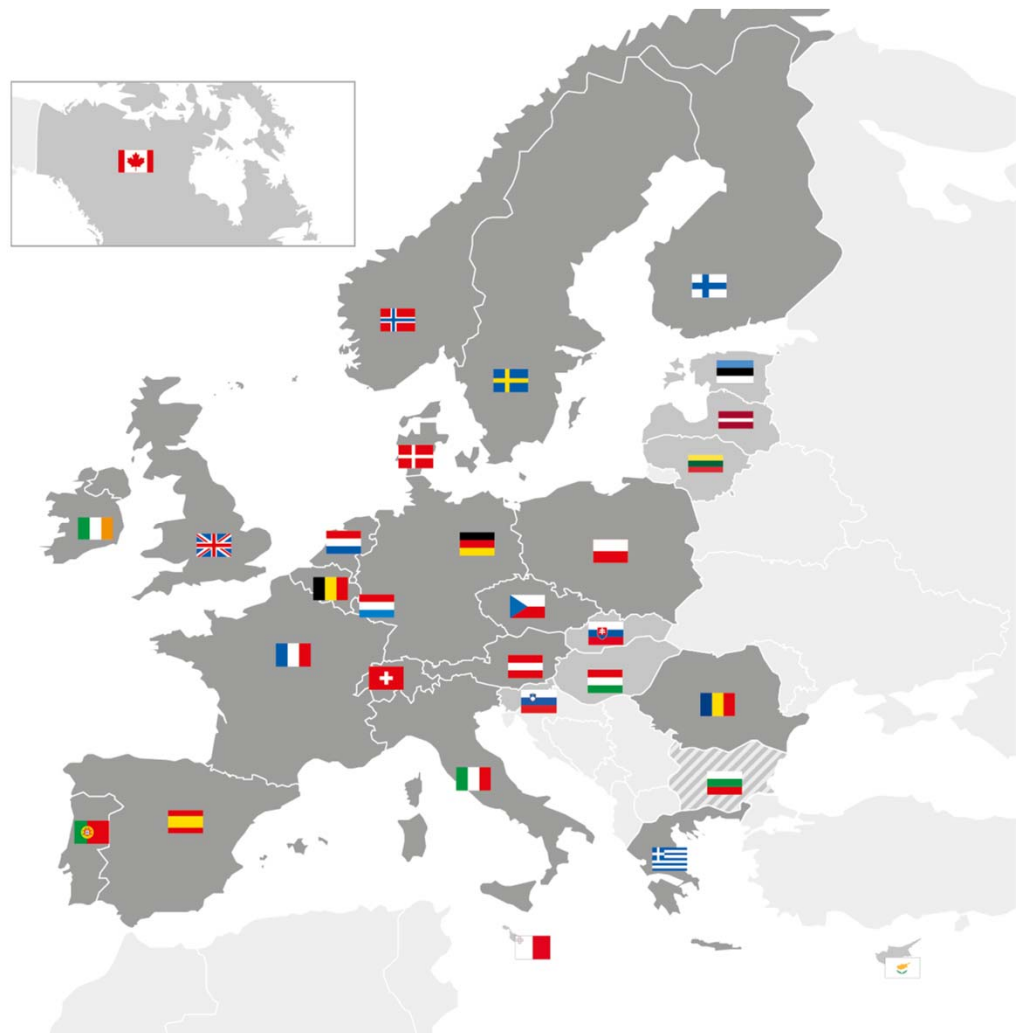
# 20 MEMBER STATES AND GROWING



**ESA has 20 Member States: 18 states of the EU (AT, BE, CZ, DE, DK, ES, FI, FR, IT, GR, IE, LU, NL, PT, PL, RO, SE, UK) plus Norway and Switzerland.**

Eight other EU states have Cooperation Agreements with ESA: Estonia, Slovenia, Hungary, Cyprus, Latvia, Lithuania, Malta and the Slovak Republic. Bulgaria is negotiating a Cooperation Agreement.

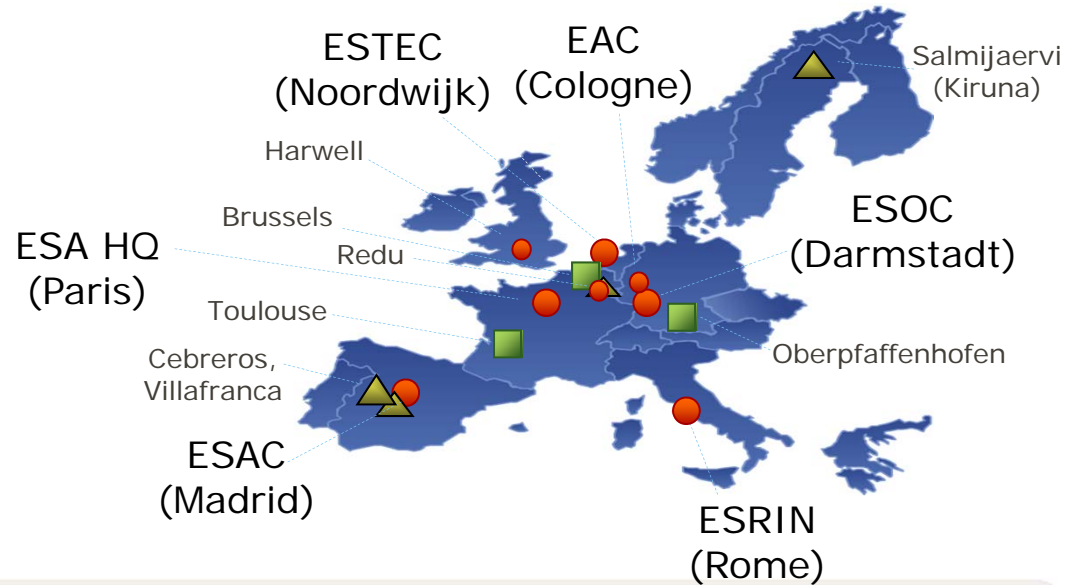
Canada takes part in some programmes under a Cooperation Agreement.



# ESA'S LOCATIONS



- ESA sites/facilities
- Offices
- ▲ ESA ground stations

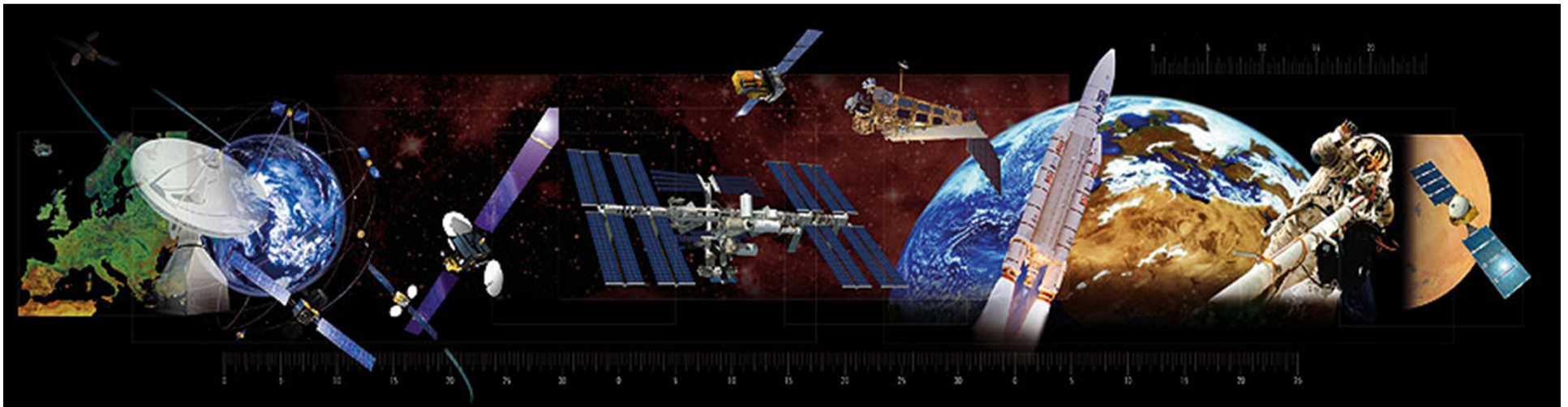


# ACTIVITIES



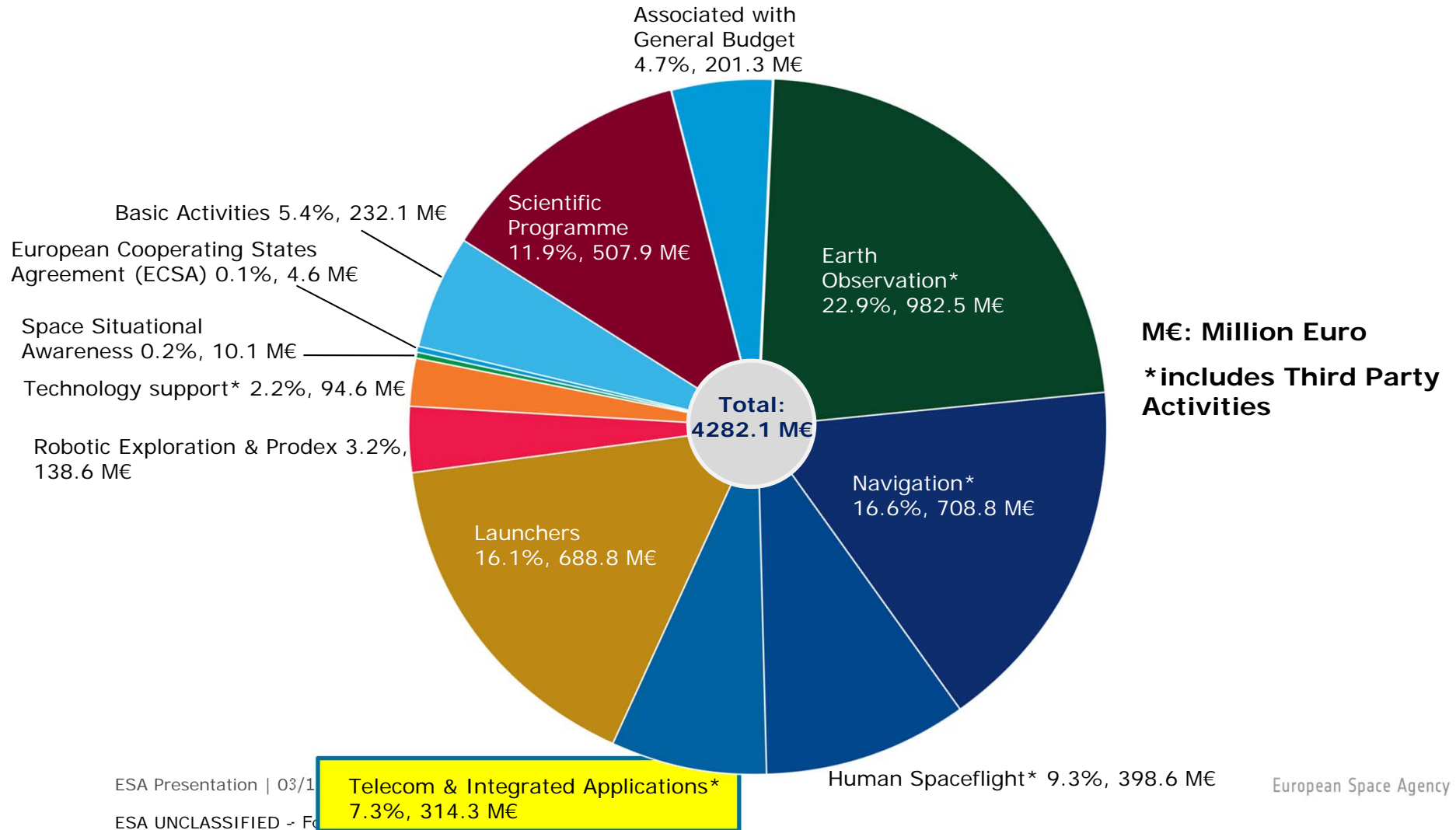
ESA is one of the few space agencies in the world to combine responsibility in nearly all areas of space activity.

1. Space science
  2. Human spaceflight
  3. Exploration
  4. Earth observation
  5. Launchers
- Navigation
  - **Telecommunications**
  - Technology
  - Operations





# ESA 2013 BUDGET BY DOMAIN





**TELECOMMUNICATIONS &  
INTEGRATED APPLICATIONS**

European Space Agency



# ENSURING COMPETITIVE AND INNOVATIVE INDUSTRY, BRINGING SPACE TO SOCIETY



- Helping European industry to compete on the world stage;
- Supporting technological R&D and pioneering developments to bring new technologies near to market readiness;
- Building partnerships capable of creating wealth, jobs and new services for the citizens of Europe;
- Improving our daily lives, from health services to civil protection and rescue operations.
- Securing relevance to society.

## ESA's **Advanced Research in Telecommunications Systems (ARTES)**

programme promotes the development of technology, products and systems in partnership with industry.

ARTES 20: **Integrated Applications Promotion** – bringing together diverse space infrastructures to facilitate innovative solutions, leading to sustainable services.

# 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 Satcom Applications
- ❑ ARTES 5: Technology
- ❑ ARTES 20: Integrated Applications Promotion

and specific Mission/System orientated Programme Elements

- ❑ ARTES 7: EDRS – European Data Relay Satellite System
- ❑ ARTES 8: Alphasat/Alphasat – Large Platform Mission
- ❑ ARTES 10: Iris – Satcom for Air Traffic Management
- ❑ ARTES 11: Small GEO platform/mission
- ❑ ARTES 14: NEOSAT – Next Generation Platform
- ❑ ARTES 21: Sat-AIS – Satellite Automatic Identification System
- ❑ ARTES 33: Industry initiated Public Private Partnerships

## 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**.

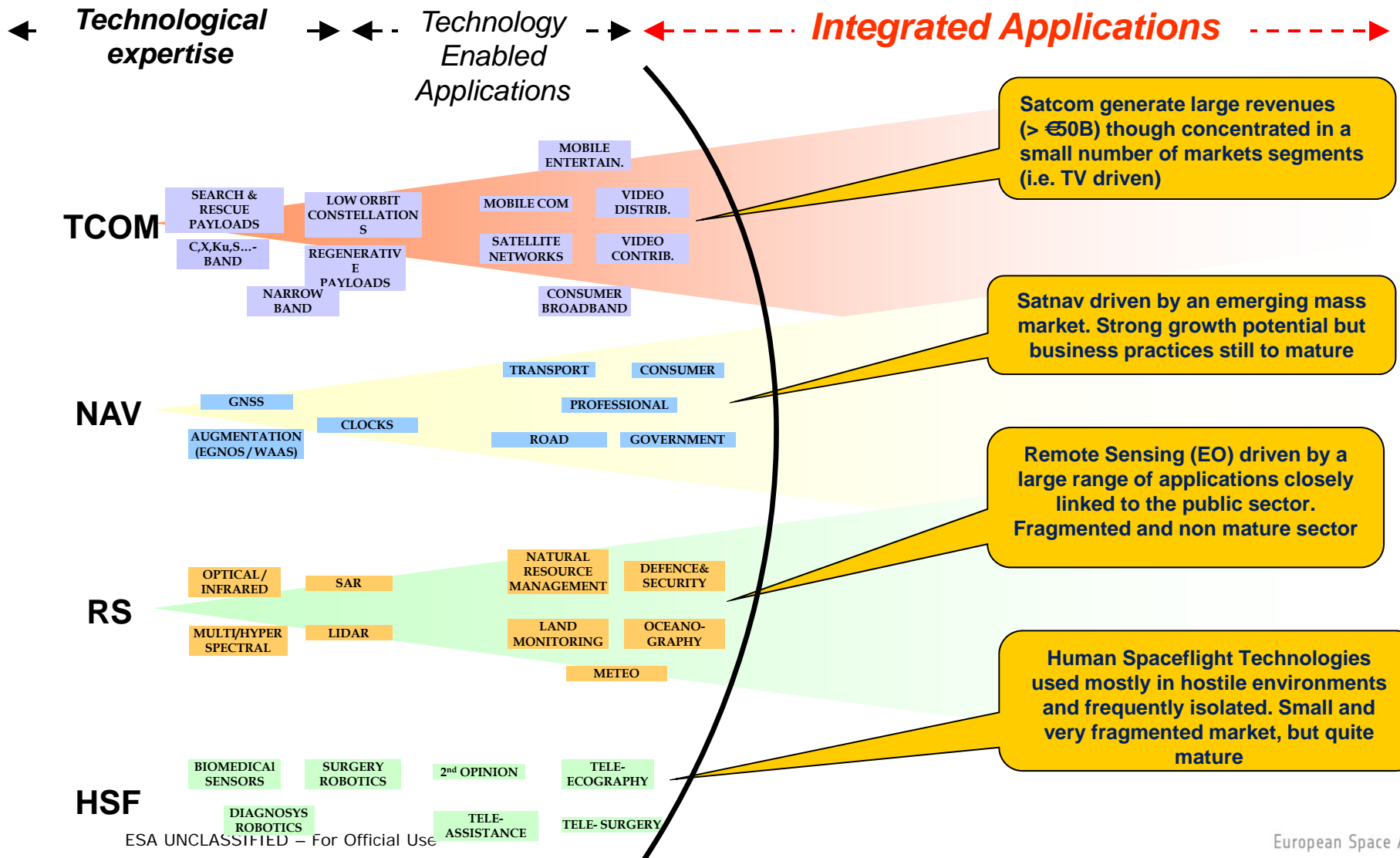
Addressing global challenges in different thematic areas:

**Space for:** Health, Security, Safety, Transport, Energy,  
Environment, Agriculture, Insurance, ...

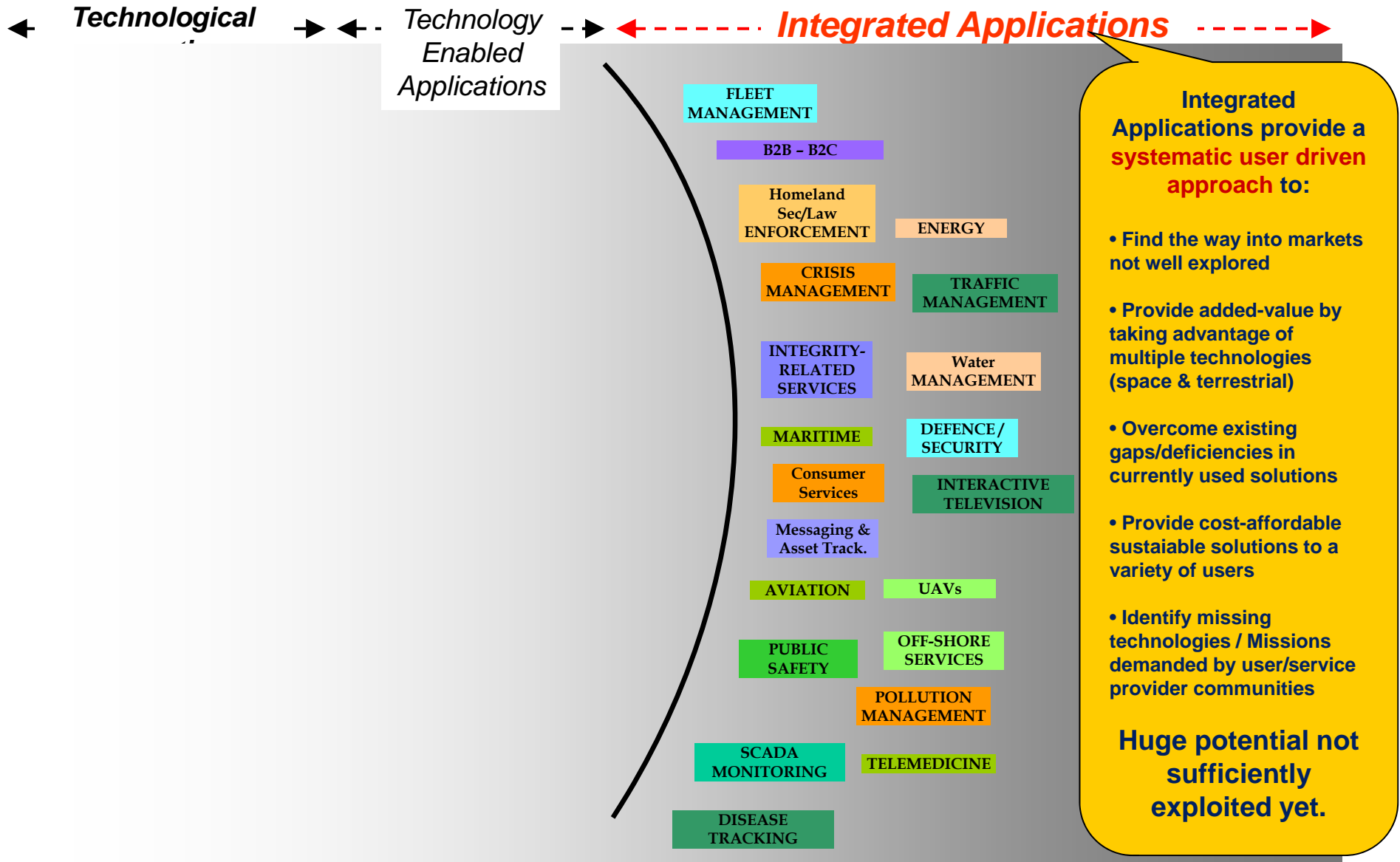
**Incubator of Services**

# ESA's Integrated Applications Promotion Programme (ARTES 20)

## The Technologies



# ESA's Integrated Applications Promotion Programme (ARTES 20) The Applications



# ESA's Integrated Applications Promotion Programme (ARTES 20)



## Earth Observation

## Tele-communication

- Narrowband: Inmarsat, Iridium, Globalstar
- Broadband: SES Astra, Inmarsat, Avanti, Eutelsat, Intelsat, etc.

## Navigation

GPS, GLONASS  
(Galileo)

→ Developing new services for new user communities

- Optical: Geoeye, Landsat, Spot

- Radar: Radarsat, Terrasar-X, Cosmo Skymed

(GMES – Sentinels)

- Biological, medical science

- Physical science  
- Experimental Platform  
- Processes, procedures

Manned Space Flight

e.g. algorithms:

- Anomaly detection  
- Data compression

technology



# ESA's Integrated Applications Promotion Programme (ARTES 20)



Earth Observation

Tele-communication

Navigation

→ Developing new services for new user communities

User Demand

Feasibility Study

Demo

Operational Service

Manned Space Flight

```
Latitude(deg) : 38.45
Longitude(deg) : 14.45
Elevation(m) : 5799
Position
X coordinate : 3839591
Y coordinate : -50599
Z coordinate : 5799
Latitude(deg) : 5
Longitude(deg) :
Elevation(m) :
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# ARTES 20 – Integrated Applications Programme Characteristics



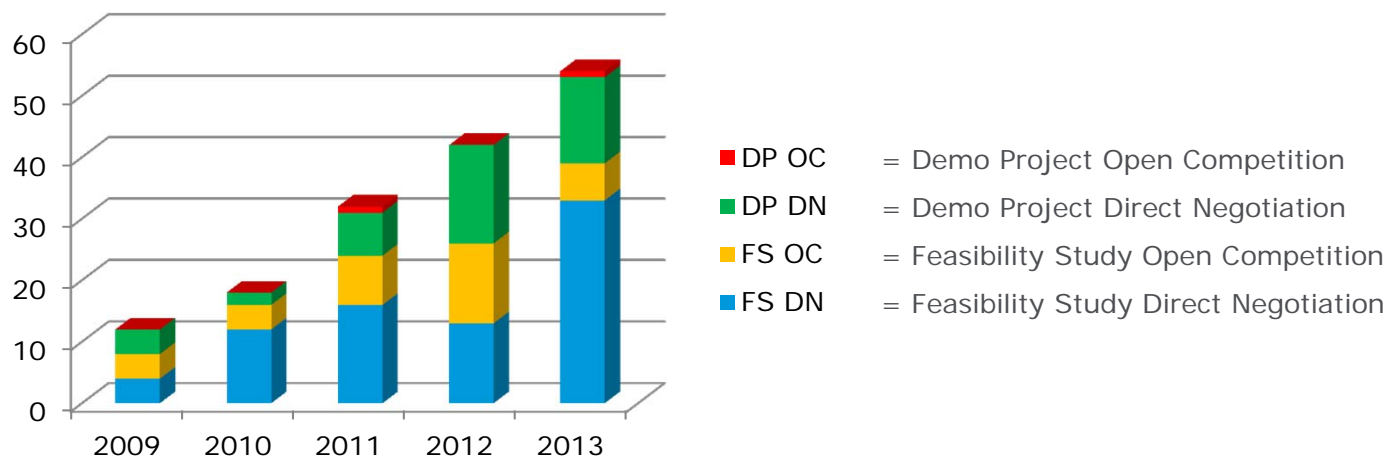
1. **Objective:** Development, integration and pilot utilisation of **Integrated Applications based on several space assets**
2. **User driven activities aiming for sustainable services**
3. **Scope:** Feasibility Studies & Demonstration Projects
4. A) Ideas originated by ESA in collaboration with users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

# ARTES 20 – Integrated Applications Programme Characteristics



- 1. **Phase 1:** 2009 – 2013  $\Rightarrow$  58,60 M€ (D: 6,05 M€)
- Phase 2:** 2013 – 2016  $\Rightarrow$  80,03 M€ (D: 6,12 M€)

## 2. Activities approved by member states



	FS DN	FS OC	DP DN	DP OC	
2009	4	4	4	0	12
2010	12	4	2	0	18
2011	16	8	7	1	32
2012	13	13	16	0	42
2013	33	6	14	1	54
	78	35	43	2	158

# ARTES 20 – Integrated Applications Programme Characteristics



				D Involvement	
User domains	FS	DP		FS	DP
Health	9	6		1	1
Safety and Security	42	10		9	3
Transport	22	13		4	3
Energy	10	5		3	1
Environment	23	2		3	0
Other areas	7	9		0	1
<b>Total</b>	113	45		20	9

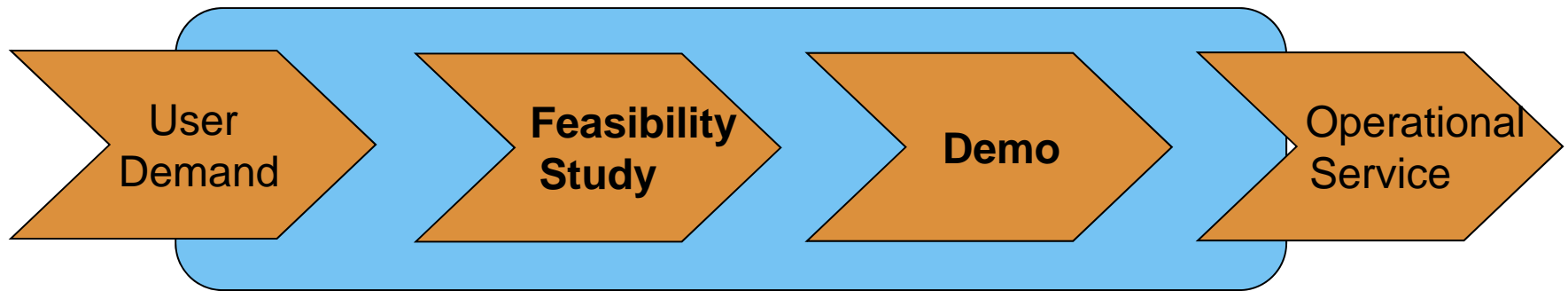
For further information, please, check also our project web pages of IAP feasibility studies and demo projects under:

<http://iap.esa.int/projects>

# 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](http://iap.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

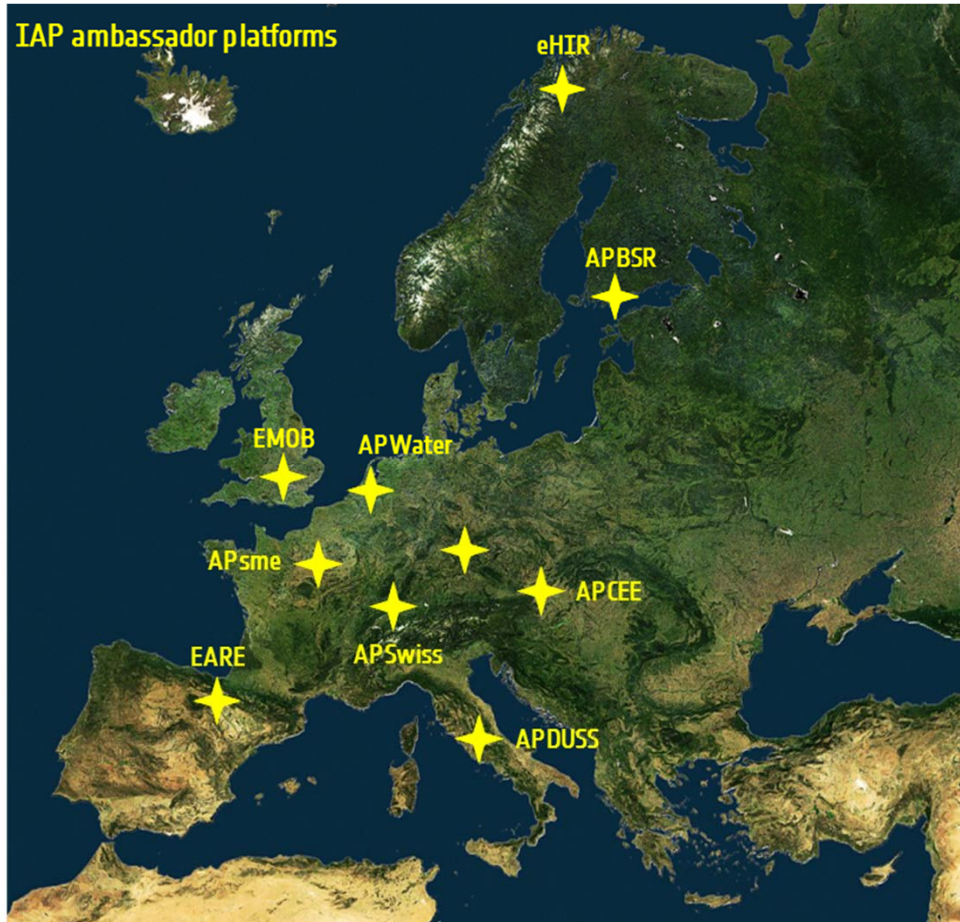
Funding by ESA:

- 50% - initiated by ESA or industry

\* 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

**New in 2013: "Fast Track" studies**  
 - 50 kEuro max  
 - fast implementation (within 2 months)  
 - short duration (3-6 months)

# ESA's IAP Programme (ARTES 20) Ambassador Platforms

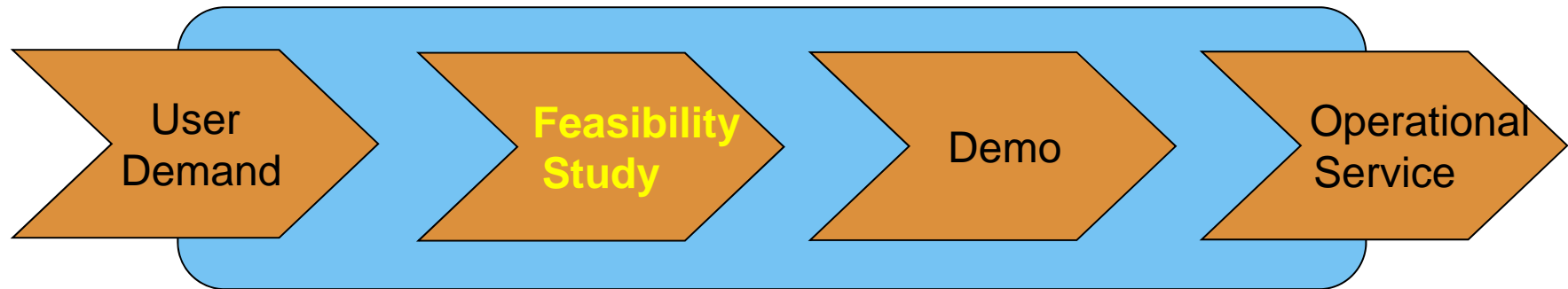


## Ambassador Platforms established

- eHIR (N): e-Health in Inaccessible Regions
  - EMOB (UK): Enhanced MOBility
  - APCEE (A): Integrated Applications in Central & Eastern Europe (by ESPI)
  - APBSR (FI): AP on Baltic Sea Region
  - APDUSS (I): Dual-Use Space-based Services
  - APWater (NL): Water Management
  - AP-D (D): AP for Germany**
  - AP (LUX): Space for Mediterranean
  - APsme (F): AP for SMEs
  - APSwiss (CH) AP for Switzerland
- Further APs in implementation process

# ESA's IAP Programme (ARTES 20)

## Programme workflow – feasibility studies



### Feasibility Studies: (9 months, max cost 500 k€)

- Understanding what the user needs
- Assessing the viability and potential sustainability of service & system
- ESA funding:
  - 100% when ESA initiates a the study (dedicated competitive tender (ITT))
  - 50% (\*) when industry initiates the study (against AO 6124, the ARTES 20 continuous open call for proposals (non competitive tender))(\* 100% for academia and research organisations)

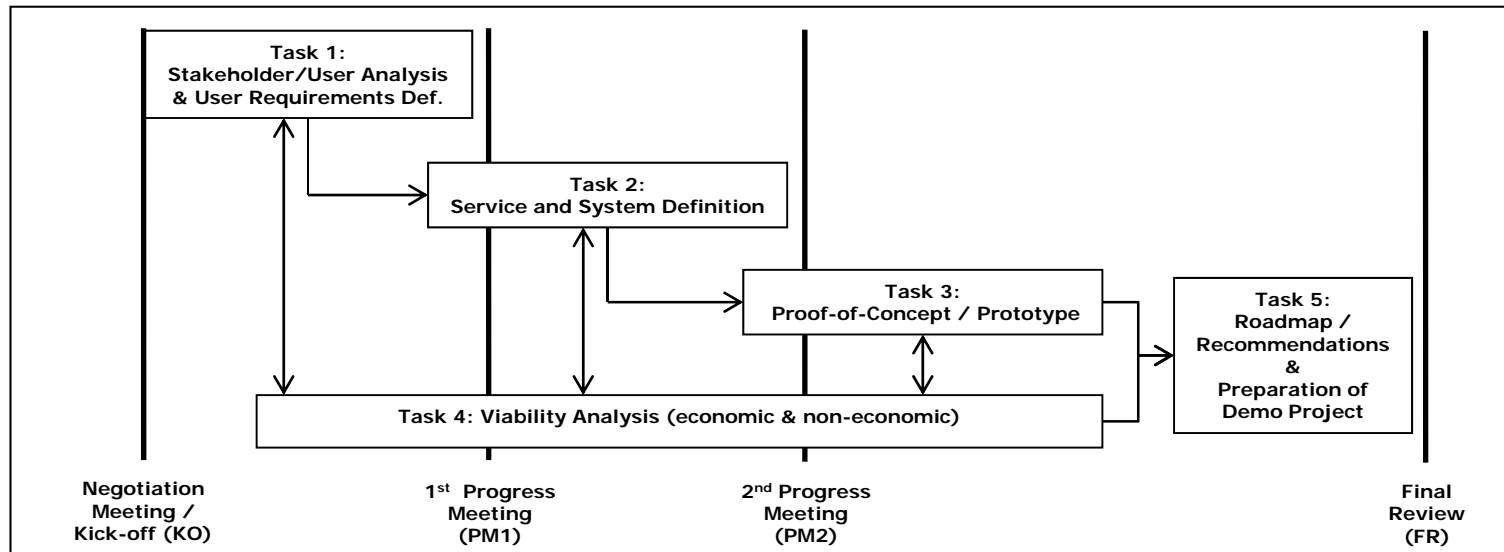
### Process:

- Outline proposal online tool: <http://iap.esa.int/what-and-why/proposal-guide/iap>
- If mature, submission of full proposal according to AO 6124 (incl. letter of support)

# Feasibility Studies (fully funded and co-funded)



## Principle Study Logic of an IAP Feasibility Study

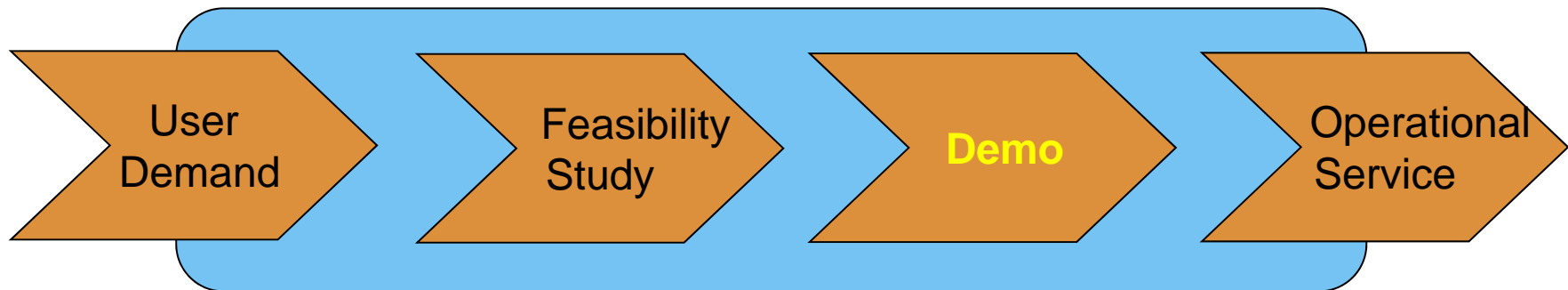


- Task 1 – consolidating the interest of the related stakeholders and users, analysing their problems and needs, and defining the user requirements,
- Task 2 – defining the services and the service value chain, generating the specifications and architecture of the related system including design justification, identifying the critical elements
- Task 3 – 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 4 – analysing the economic and non-economic viability of the services and the associated system
- Task 5 – preparing the roadmap for the further implementation, defining a potential demonstration project, securing the involvement of users/stakeholders



# ESA's IAP Programme (ARTES 20)

## Programme workflow – demo projects



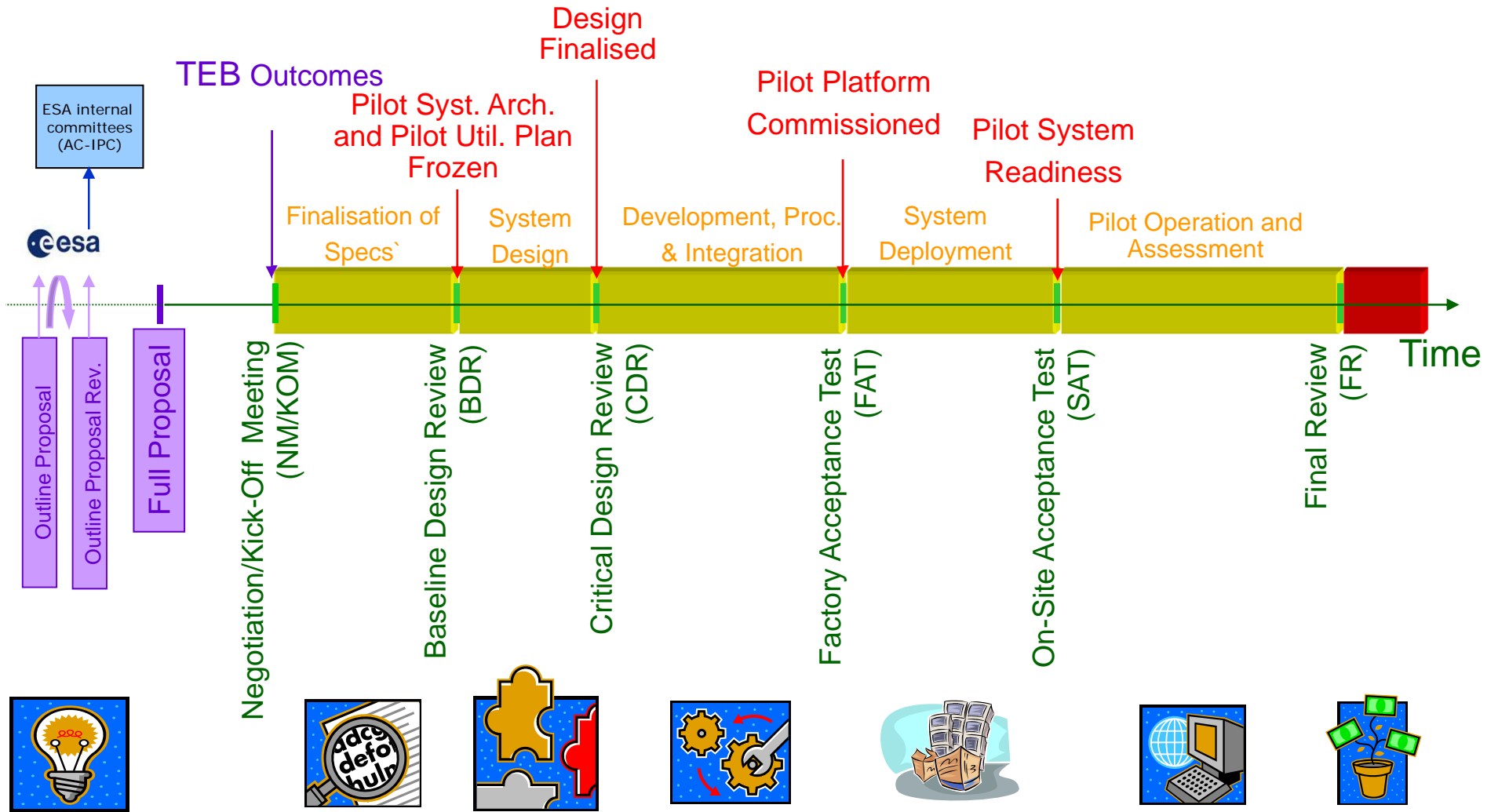
### Demonstration Projects:

- Developing the concept into a service (technically and business plan)
- Pre-operational demonstration of the Service with representative users in their operational environment (can range from few months to 2 years)
- ESA funding is always 50% of the project cost

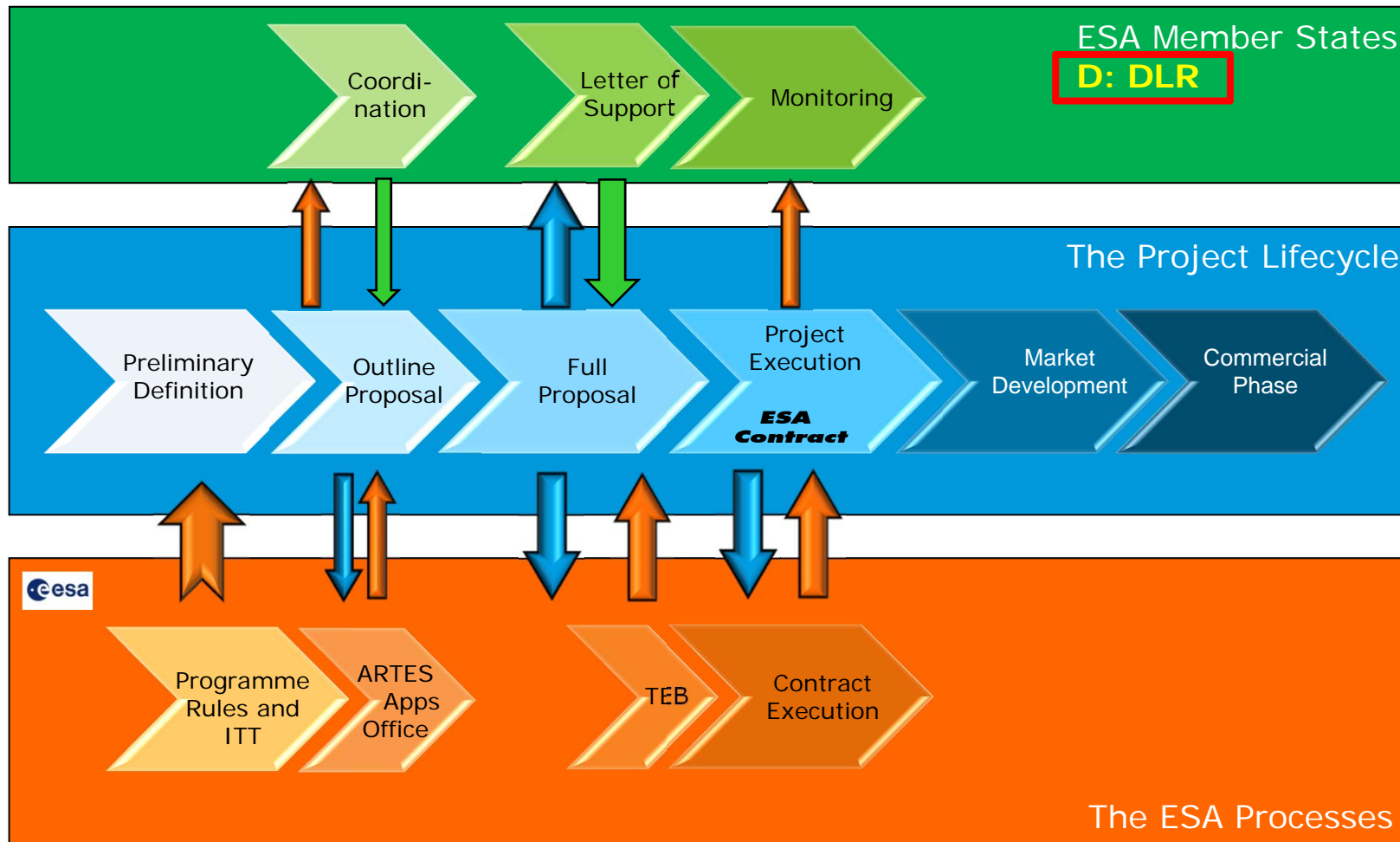
### Process:

- Can be initiated from a feasibility study or can be inserted directly
- Outline proposal online tool: <http://telecom.esa.int/opdt/artesapps/artes20demo>
- If mature, submission of full proposal according to AO 6124 (incl. letter of support)

# Demonstration Project



# ESA's IAP Programme (ARTES 20) Project Lifecycle & ESA Processes



TEB: Tender Evaluation Board

# ESA's IAP Programme (ARTES 20)

## Key Performance Indicators for Sustainability



- Investigation of 30 product/service samples from ARTES 3-4 Application Projects

Predictive analysis						
Project "type"	Selling before end of pilot stage	Motivation for stakeholders need	Users' acceptance	Technical Quality	Customer WTP	Profitable ? (break even point reached)
Five Stars	1	1	1	1	1	97.8%
No customers' commitments	1	1	1	1	0	55.0%
Underused in the pilot	1	1	0	1	1	93.6%
Underused and no customer commitments	1	1	0	1	0	28.9%
No sales in the pilot	0	1	1	1	1	35.2%
No sales and underused	0	1	0	1	1	15.3%
Technical flaws	1	1	1	0	1	0.0%
No motivation from stakeholders	1	0	1	1	1	0.0%

Observation

Estimation

# 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).

## Ideal characteristics of involved parties:

- **User:**
  - representing / leading broader markets (champion)
  - enabling the market access
  - communicator to spread the message
  - open for new solutions and systems
  - willing to engage as stakeholder / customer / client
- **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)

## 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 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 your 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 DLR (your 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



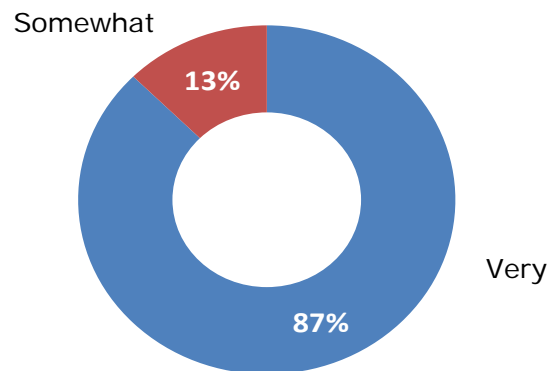
- **Financial support** in the co-funded programmes ARTES 20 (Integrated Applications Promotion) and ARTES 34 (Satcom Applications)
- **Consultancy** from idea generation until introduction of a sustainable application / service
- **Access to ESA's technological expertise** in a number of disciplines 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

# Euroconsult Study on IAP

## ⇒ importance of end user participation



### Importance of end-users participation



The participation of end-users in IAP is considered as very important by most of the interviewees for:

- understanding real market needs and requirements e.g. timeframe to launch a service
- helping to define the suitable products and services to meet users' needs
- assessing the service pricing
- building the demo study in order to have a pre-operational service business model
- establishing relations with end-users who will also be potential clients

### Quotations from the interviews

*...The participation of end-user is critical to understand the real market's need and the necessary timeframe to launch such a service. E.g.: We got feedback from the end-users that we spend too much time to prepare for the launch of an internet portal of the service, the timing did not fit the agricultural cycle. We learned the lesson and improved the service launch timeframe in the second phase of our study....*

*...70% of end-users participants may adopt the product after the end of IAP to become real customer, highlighting the importance of end-user participation in the project. (This percentage is based on the feasibility study results.)*

*...it helps us to define the real user needs as well as to better adopt the technologies to be more suitable for the service deployment ....besides, the participation of end-user can help us to estimate if such an operational service would be profitable....*

*...The participation of end-user becomes the first reference client of the services, which is an important argument to commercialize the services in the future...*

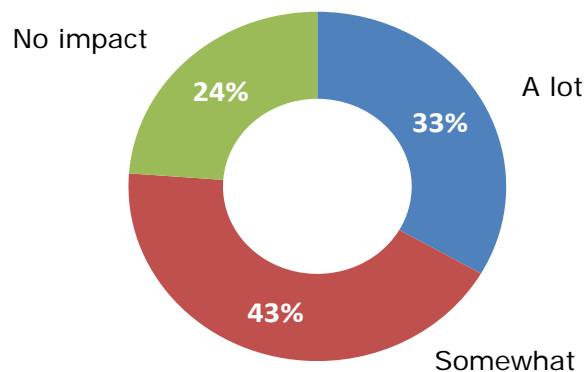
*...The end-users also help us to promote the service in the industry, e.g. Our end-user is an energy company which help them to promote the service in the energy sector.*

# Euroconsult Study on IAP

## ⇒ improving product & service portfolio



### Impact on the portfolio of product/service offering



- Over 75% of interviewees consider that their participation in IAP improved the nature & quality of their product/service offering
- IAP helped participants to understand users' needs and develop their service portfolio
- Several participants mentioned that ESA methods helped them to structure a better, more user-oriented, business plan

### Quotations from the interviews

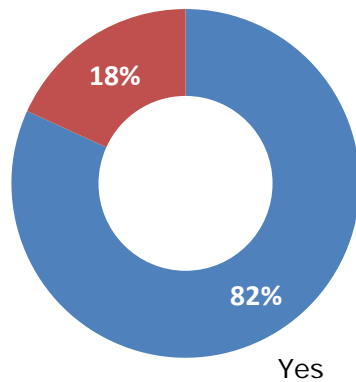
*...Thanks to the participation of IAP, we have new portfolio of services offering...*

*... Learned a lot on the methodology to build up new service and to validate user requirement. We provide service to our own clients based on ESA methods to convert user requirement to specification and to design services by validating user requirements...*

# Euroconsult Study on IAP ⇒ partnerships & international presence



## Opportunity of new partnership



Participation to IAP brought benefits to the participants

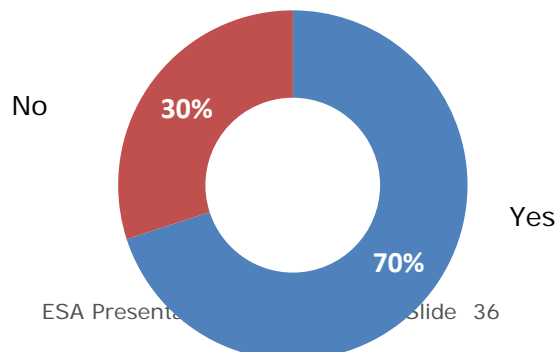
- 82% of the interviewees entered into new partnership. Mainly with the partners of the IAP consortium
- A number of participants also stated that their participation to IAP helped them to develop relationships with end-users

### Quotations from the interviews

*... We did not know our end-users partners in IAP project, through the IAP, we work with them now. Even we do not yet direct contract with them today, we did establish long term partner with them...*

*... We did not know our IAP partner before, but we are discussing potential partnerships with the current partners for other new projects...*

## Improvement of international presence



- 70% of the interviewees have improved international presence, mainly through IAP press releases and partnerships with companies in other countries

- IAP has given to many of the interviewees an international credibility and visibility they did not have before

# ESA's Integrated Applications Promotion Programme (ARTES 20)



## Opportunities:

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

Proposal Guides on IAP website under

<http://iap.esa.int/what-and-why/proposal-guide/iap>

<http://emits.esa.int> ⇒ open tenders ⇒ AO 6124

### 2. Competitive tenders (Feasibility Studies):

#### **Tenders in Preparation**

- Improving the Efficiency of Loss Adjustment & Claims Management in the Insurance Industry (FS): January 2014

#### **Ideas for new activities**

- Smart Cities: under coordination with Ambassador Platforms

Information to be found on the IAP website (announcements): [iap.esa.int](http://iap.esa.int)

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

Questions?



**If you do not know what to do:**

**Call us!**

- IAP Website: <http://iap.esa.int>
- IAP Open Call for co-funded activities online on  
- EMITS: <http://emits.esa.int> (AO6124)
- Information on IAP Open Competitive Tenders online on  
- IAP website <http://iap.esa.int/intended-tenders/all>  
- EMITS at the time of publishing <http://emits.esa.int>
- IAP Administrative Guide and Outline Proposal forms online on  
- <http://iap.esa.int/what-and-why/proposal-guide/iap>
- Project web pages of IAP feasibility studies and demo projects  
<http://iap.esa.int/projects>
- IAP general email address: [iap@esa.int](mailto:iap@esa.int)

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