

ARTES 4.0 Core Competitiveness – an Overview

May 2024



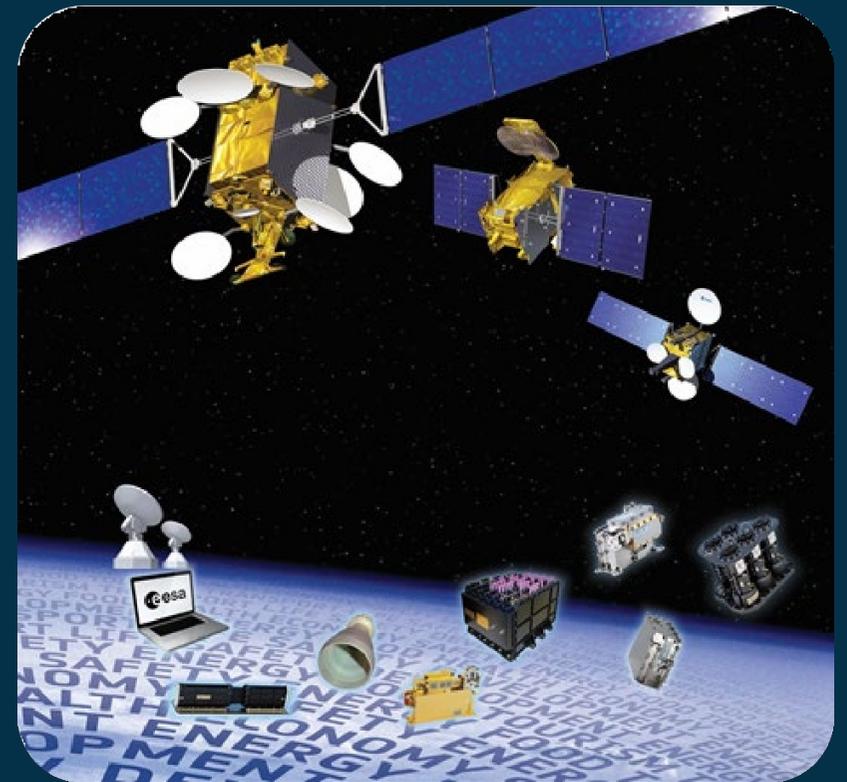
ARTES Core Competitiveness - Objective



To Improve the capability and competitiveness of the ESA Member States industry in the world satellite communications market

ARTES:

Advanced Research in
TElecommunications Systems



The ARTES Programme: Based on Partnership



- **National Delegations** contribute funding
- **Industry & institutions** develop technology and products for the world satcom market
- **ESA** shares the risks and manages the contracts and activities
- **Industry** brings the end result to market & retains Intellectual Property Rights (IPR) when co-funded

Strategic Programme Lines

Responding to societal/economic objectives

Space for 5G/6G & Sustainable Connectivity



Space Systems for Safety and Security (4S)



Optical & Quantum Communication- ScyLight



Direct access to Programme Lines

Generic Programme Lines

Maximum efficiency



Future Preparation



Core Competitiveness
(ARTES C&G + AT)



Partnership Projects



ARTES 4.0 Core Competitiveness



Makes **funding** available

Guides you to the most suitable programmatic tool



Facilitates **synergies and cooperation** among Industry

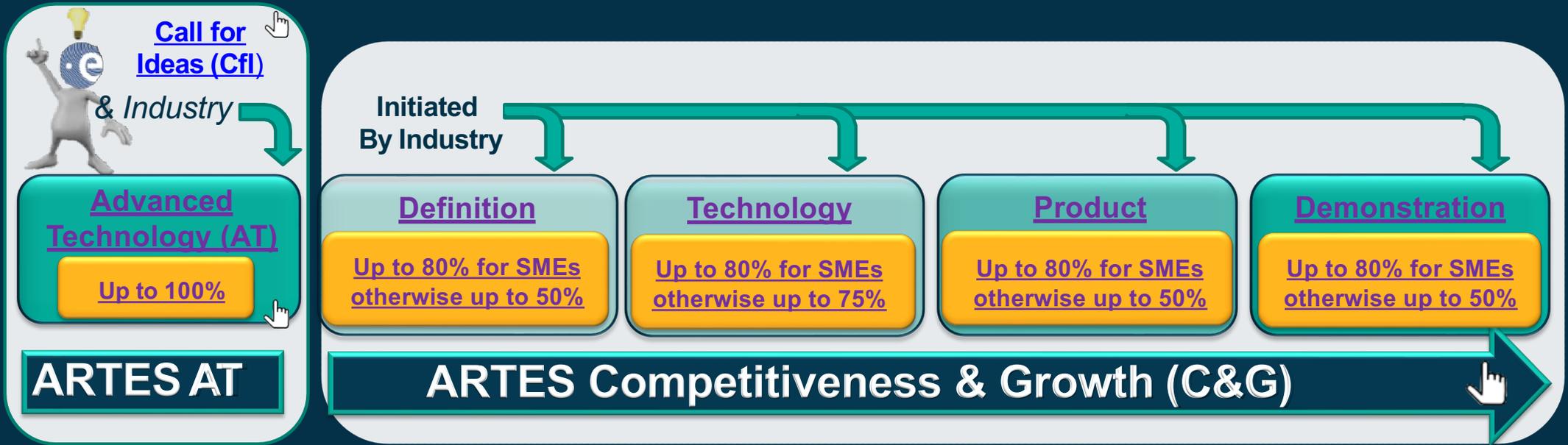
Independent assessment and technical **expertise**

Full transparency, confidentiality and fairness

Think tank for ideas and opportunities



ARTES Core Competitiveness Element



Open Competition



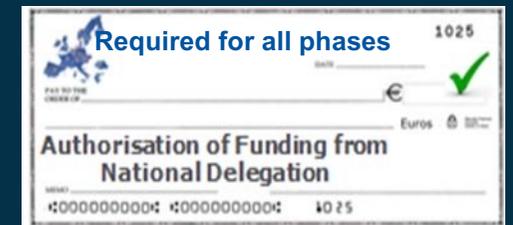
Technology Push

Direct



Negotiation

Market Pull

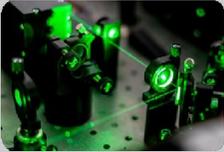
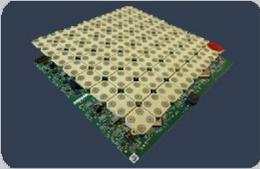
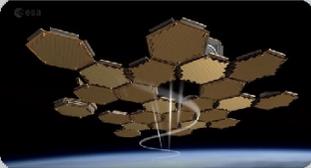


ADVANCED TECHNOLOGY



ARTES Core Competitiveness Technology Pillars



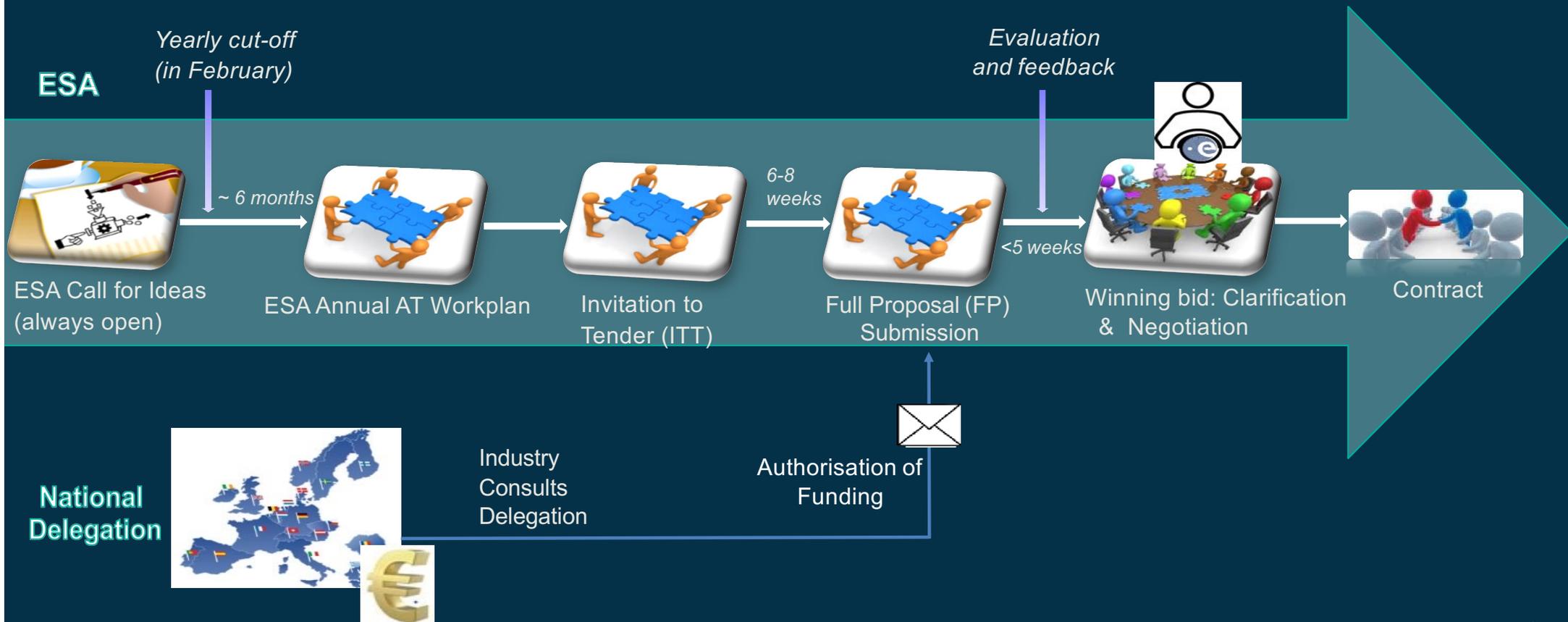
Wavelength Agnostic Communication	Digital and Secure Processing, Cloud & AI	Optical and Quantum Communication	Smart Antennas	Disruptive Satellite Platforms and Sub-System	Smart design and sustainable manufacturing
	 <p>HPC at ECMWF</p>  <p>MDM5000 Satellite Modem</p>	 	 	 	 
<p>Multifrequency communication techniques from VHS to mm-wave; Devices, Equipments and Systems from mW to kW power range.</p>	<p>Efficient and scalable digital signal processing enabling (Secure) Software Defined Systems; Virtualization; HPC and orchestration hardware and techniques.</p>	<p>Optical and quantum devices, systems, techniques and equipment for "Fibre in the Sky", optical payloads and towards Quantum Internet.</p>	<p>Multifrequency, multi-beam antennas ready for volume production. Large lightweight, stowable reflectors.</p>	<p>Stackable, orbit specific, demisable satellite platforms and sub-systems ready for volume production and batch launch.</p>	<p>Digital twins; AR supported design; Advanced Materials; Green and sustainable volume production techniques.</p>



ARTES Advanced Technology – ARTES AT



Up to 100% funded, open competition



ARTES 4.0 Advanced Technology (AT) Website



Work Plans and Activity Status: <https://connectivity.esa.int/advanced-technology>

CSC Connectivity & Secure Communications

CORE COMPETITIVENESS

ESA's ARTES Core Competitiveness programme helps European and Canadian industry to develop innovative satcom products, services, systems and partnerships.

[Home](#) » [Advanced Technology](#)

ARTES Advanced Technology is dedicated to long term technological development of the satcom industry based on ESA's initiative. This element focuses on research and development of new technologies and techniques in telecom satellites, ground and user equipment for future or evolving satcom systems.

[Download the ARTES AT Workplans for Current and Previous Years](#)

[Download the ARTES 4.0 Planned Activities Summary Table](#)



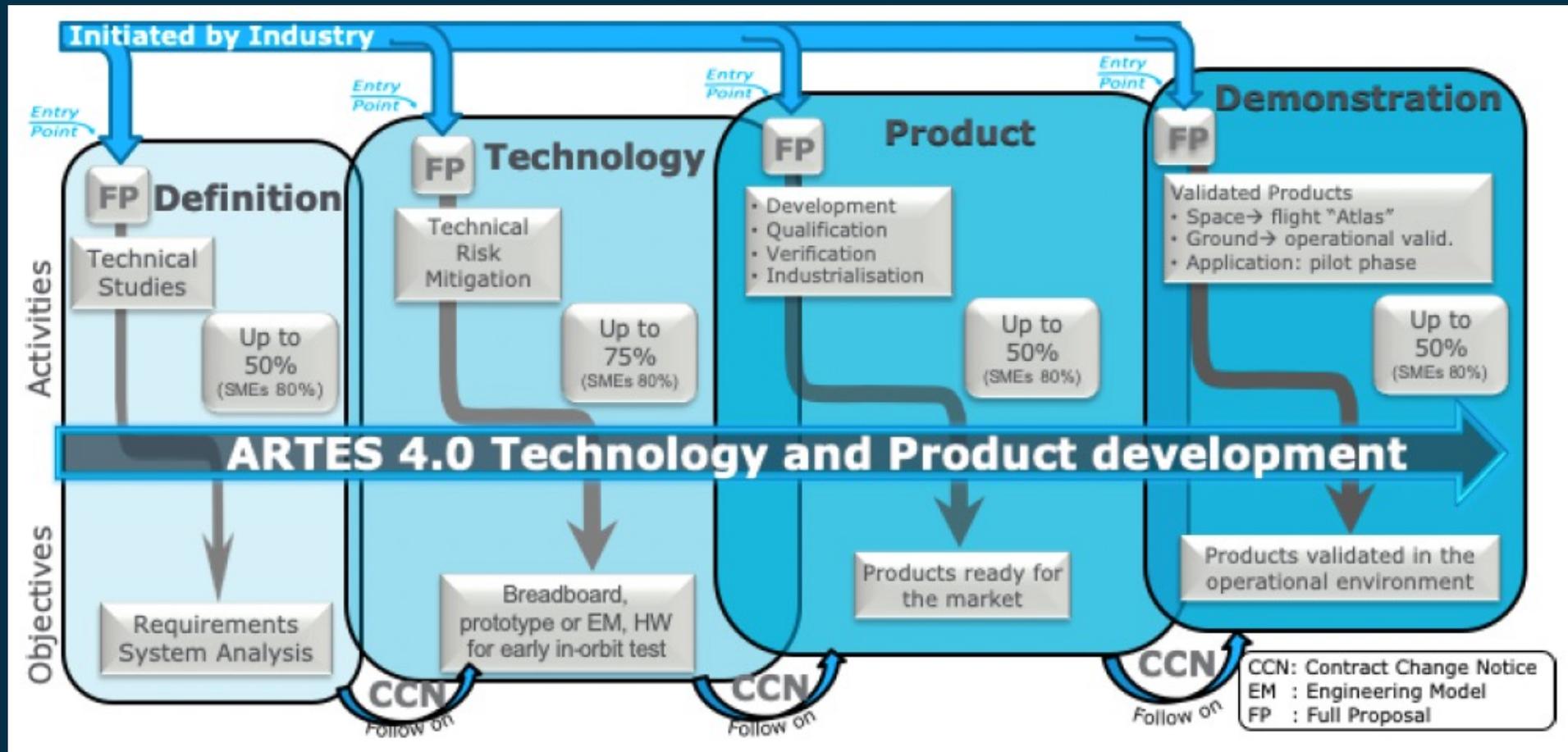
COMPETITIVENESS AND GROWTH

Industry-initiated

Industry-initiated
ESA-Initiated

ARTES 4.0 Competitiveness & Growth: Development Phases

Initiated by Industry (Outline Proposal, Full Proposal)



Funding Levels in ARTES C&G - Industry



C&G Development Phase	Main goal(s)	Funding level up to	
		Non-SME	SME
Definition Phase	Establish user requirements / spec. and define baseline	50%	80%
Technology Phase	De-risking; tested BB or EM; early in-orbit test	75%	80%
Product Phase	Qualification / industrialisation; (E)QM	50%	80%
Demonstration Phase	Validate the product in its operational environment; PFM	50%	80%

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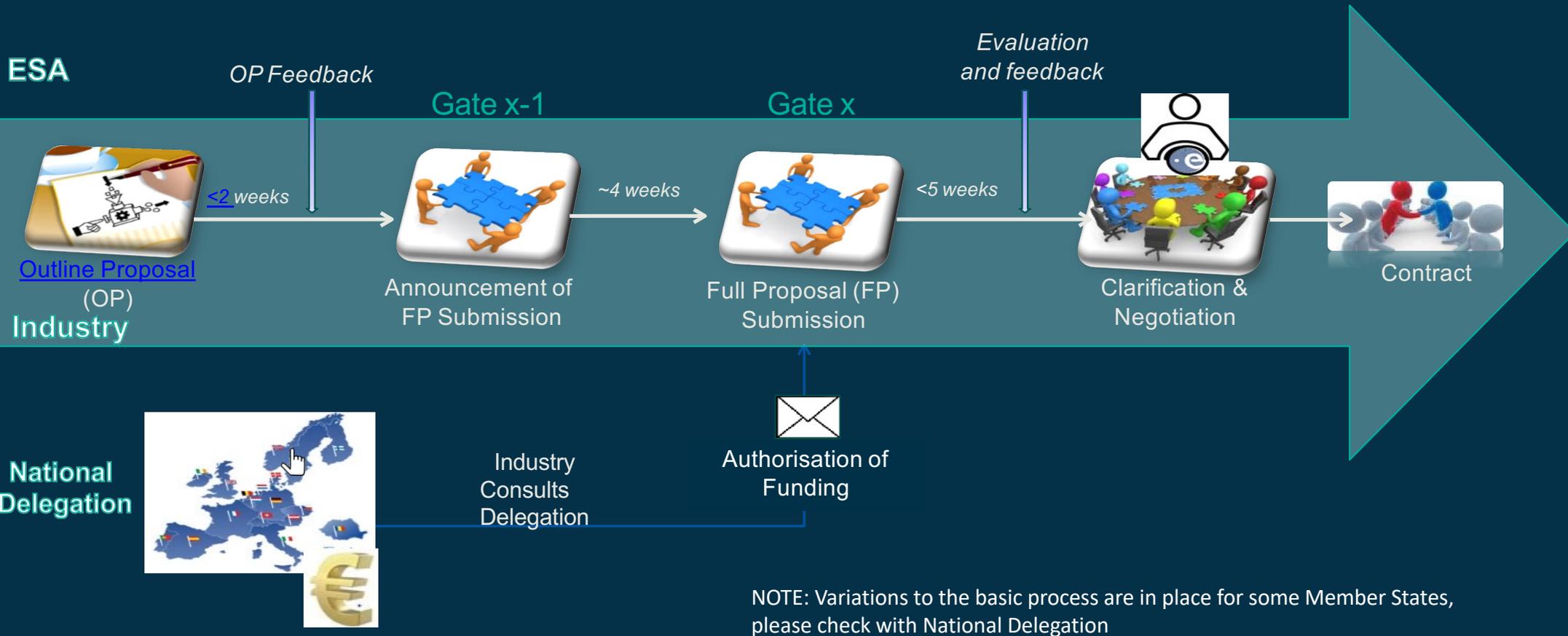
Funding Levels in ARTES C&G - Institutions



	Maximum Funding Level for Universities or Research Institutes		
ARTES C&G Development Phase	With commercial interest in the product (Non-SME status)	With commercial interest in the product (SME status)	No commercial interest in the product (up to 30% of the total contract cost)
Definition Phase	50%	80%	50%
Technology Phase	75%	80%	100%
Product Phase	50%	80%	50%
Demonstration Phase	50%	80%	50%



ARTES C&G Standard Process



NOTE: Variations to the basic process are in place for some Member States, please check with National Delegation



ARTES AGILE+ Intention and Scope



ARTES AGILE+ supports development activities within the ARTES 4.0 Call for Proposals covering Technologies and Products in C&G, ScyLight, 4S and 5G using the same implementing rules as for C&G:

Intention:

- Foster Innovation and support **opportunistic developments** with limited risks for stakeholders
- Allow **New Space approaches** (e.g. iterative design, spiral development, agile and lean)
- Outreach: **Newcomers** (easily gain experience of working with ESA) and SME focus
- **Simplify** the entry points in C&G type of activities
- **Faster** implementation
- **Simplified** ESA templates and limited proposal effort

Scope:

- **ESA Firm Fixed Price < €500,000.**

ARTES Standard and ARTES AGILE+



	Standard ARTES 4.0 Call for Proposals	ARTES AGILE+
Duration	As proposed	Typically ≤12 months
CCN	Possible	Possible
AC/IPC	Applicable	N/A
Max ESA price	Not limited	500k Euro
Prior Work / IKC	Allowed under defined conditions	Not allowed
Expenditure Outside MS	Above 100k Euro (AC) and 200k Euro (IPC) approval	Above 100k Euro not allowed
Outline proposal	Standard template on CSC website	Dedicated template on CSC website
Full Proposal	Standard FP templates on esa-star and CSC website	Dedicated AGILE+ FP templates on esa-star and CSC website
Template Content	Detailed	Simplified
Contract and Negotiation	Draft Contract proposed by ESA and negotiated	ESA contract accepted at FP submission (not negotiable)
Milestone Payments	Depending on Proposal and complexity (to be negotiated)	Fixed (MTR, FR).
Payments per Milestone	To be negotiated	60% MTR / 40% FR



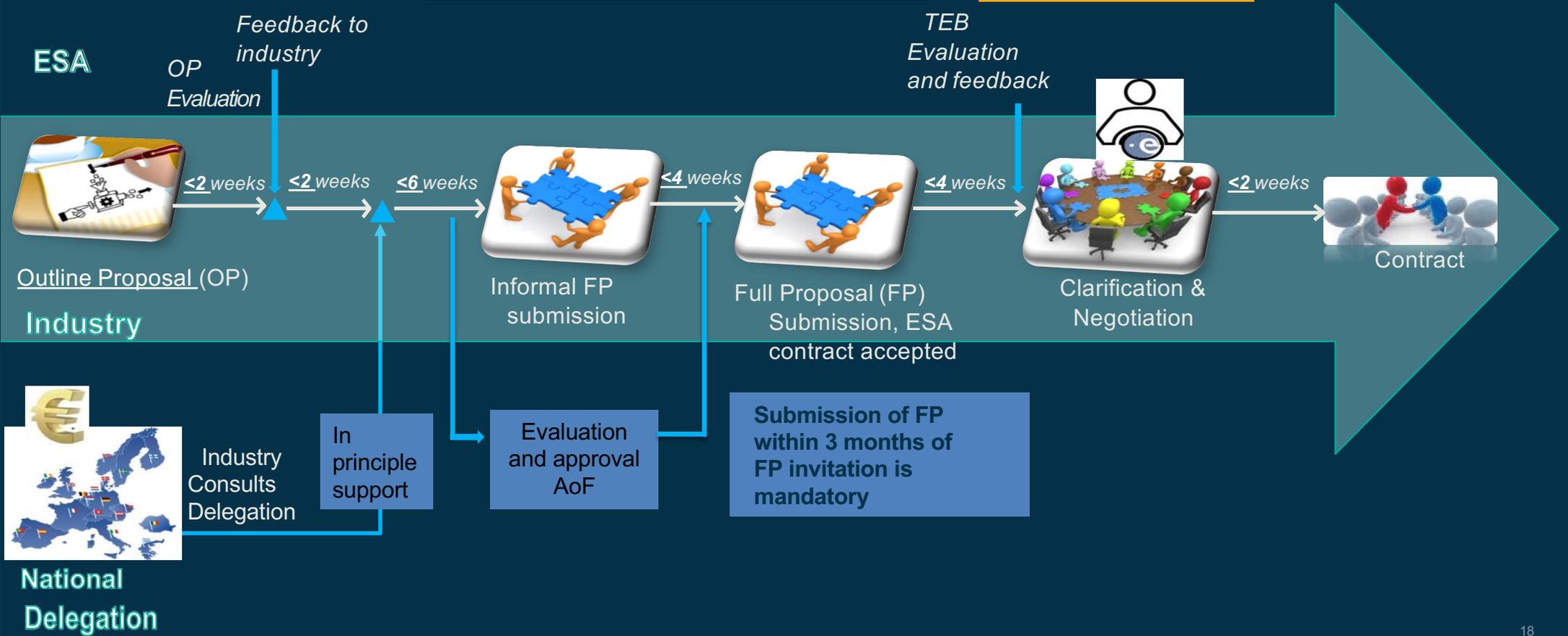
ARTES AGILE+ Process



Reduced OP preparation time

Reduced FP Preparation Time

Reduced time to contract



National Delegation



ARTES 4.0 C&G Demonstration Phase in Space: Atlas

- **Atlas** is about demonstrating performance of “flight hardware” in space within the ARTES 4.0 C&G Demonstration Phase
- **Atlas** supports any flight hardware related to **telecommunications satellites** and **telecoms products** (platform or payload)
- **Atlas** helps the product gain the critical **flight heritage**
- **Atlas** Hardware can be:
 - On any **type of mission** including other ARTES missions
 - On a flight opportunity from anywhere in the **World**
 - Within main mission (**Embedded**) or alongside the main mission as hosted technology (**Independent Hosted**) or as a dedicated mission (**Independent Standalone**)

Atlas is a flexible tool to gain flight heritage



Atlas Support

ESA provides:

- Access to ESA resources and support
- Co-funding for the flight hardware:

	Embedded (Item part of commercial mission)	Independent (Hosted or Standalone)
Accommodation study	Supported	Supported
Flight hardware design, development, manufacturing and test		
Satellite level accommodation		
Portion of satellite platform & launch cost	Not eligible	
Launch campaign specific to flight item		
IOT and early operations specific to flight item		



ARTES 4.0 C&G Outline and Full Proposals



Outline Proposal (OP)

Overview
company, planning, cost,
deliverables

**Product Definition,
Development and
Verification**

Business Plan

*ESA evaluates OP
and potentially
invites Industry
to submit FP*



Call for Proposal on ESAStar

Full Proposal (FP)

Modular Structure

4 Management

1 Cover Letter

5* Implementation

2 Business Plan

6* Financial

3 Technical

7 Contractual

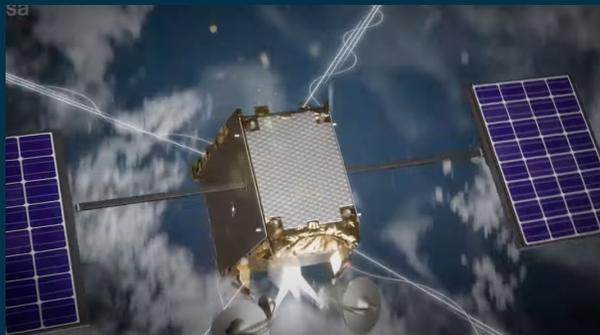
*Outline Proposal allows ESA to assess
eligibility, feasibility and validity of the activity*

* Dedicated proposal element required for subsequent Phases

ARTES CC – A Success Story



ARTES 4.0 Video



https://www.youtube.com/watch?v=nGhL0t_RZeo

ARTES 4.0 Interactive Presentation



<https://indd.adobe.com/view/8d47d0ba-389c-4ba8-825c-db0b0bf7569b>

Your success is our success!



ARTES 4.0 Core Competitiveness

Information and contact



Visit us at <https://connectivity.esa.int/core-competitiveness>

How to apply to ARTES CC: <https://connectivity.esa.int/how-apply>

Outline Proposals for ARTES 4.0 C&G and
Announcements of Activity are to be sent to:

artes-cg@esa.int

ARTES 4.0 Advanced Technology
Expression of Interest are to be sent to:

artes-at@esa.int

