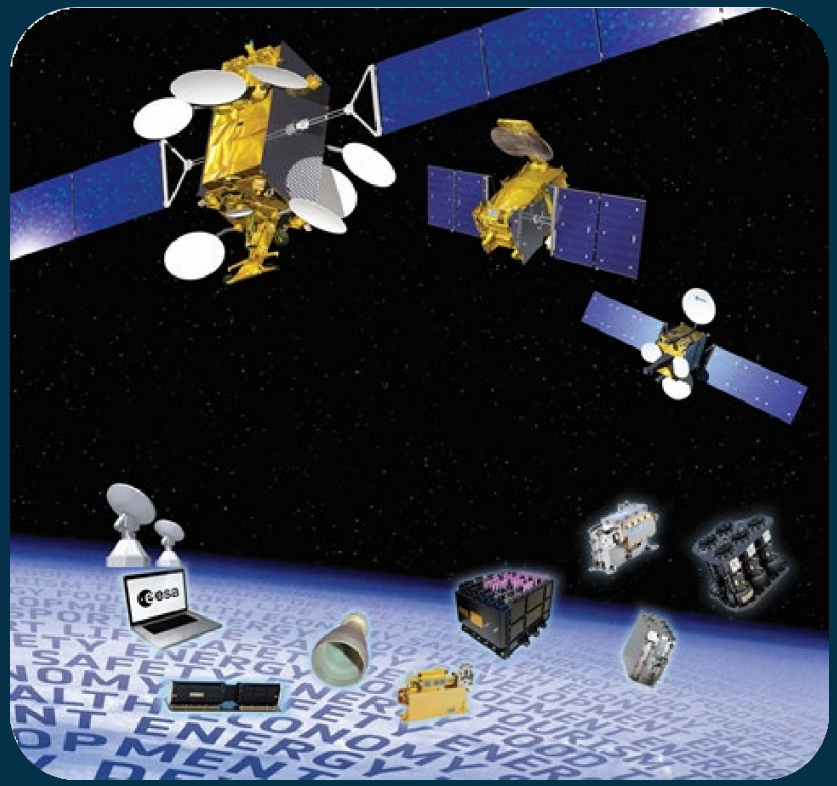
ARTES 4.0 Core Competitiveness – an Overview

15 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 **R**esearch in **TE**lecommunications **S**ystems

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

ARTES 4.0

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

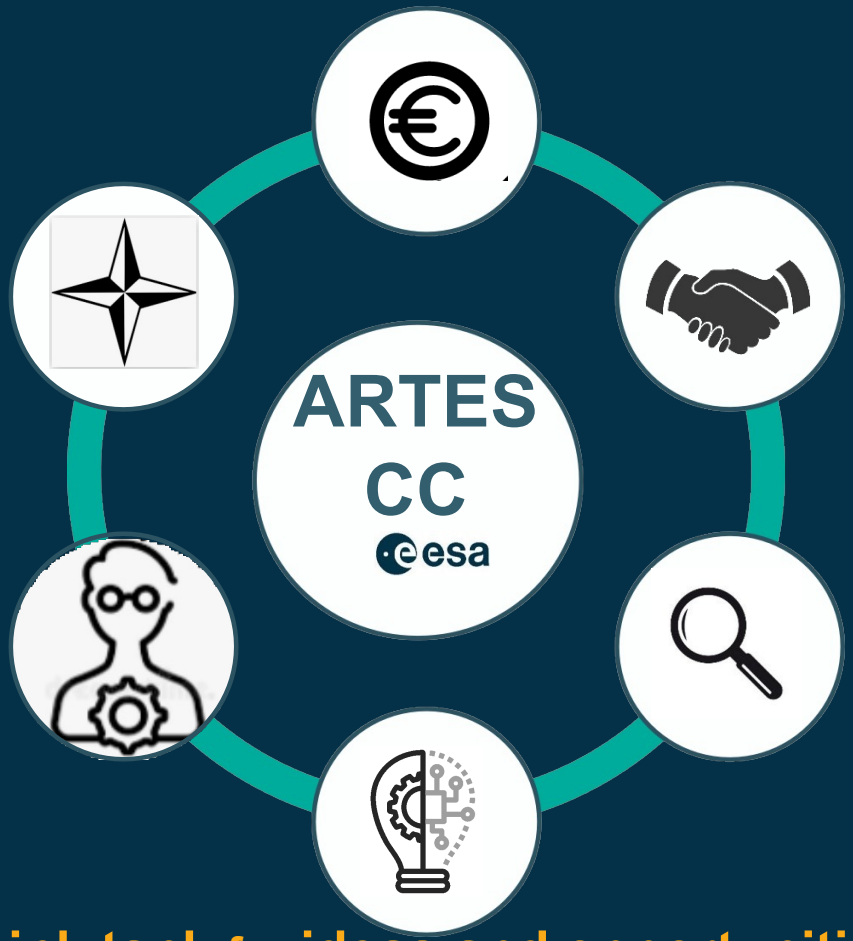
Generic Programme Lines
Maximum efficiency

- **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

Call for Ideas (CfI) & Industry

Advanced Technology (AT)

Up to 100%

ARTES AT

Initiated By Industry

Definition	Technology	Product	Demonstration
Up to 80% for SMEs otherwise up to 50%	Up to 80% for SMEs otherwise up to 75%	Up to 80% for SMEs otherwise up to 50%	Up to 80% for SMEs otherwise up to 50%

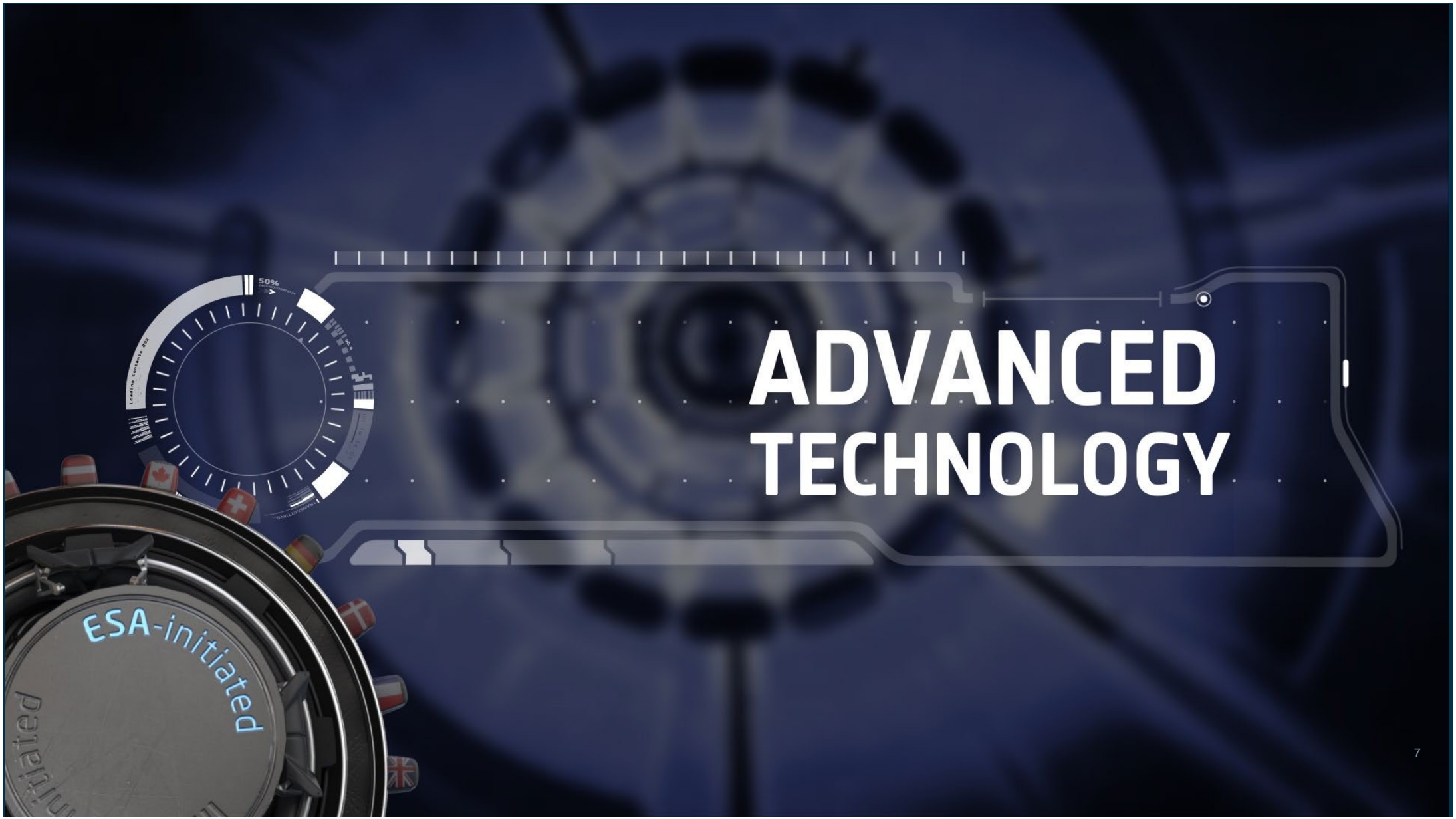
ARTES Competitiveness & Growth (C&G)

Open Competition

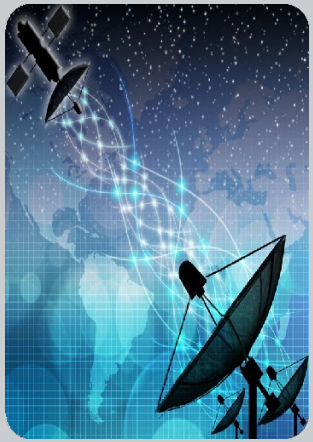
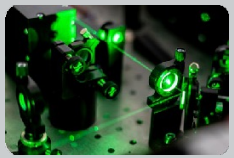
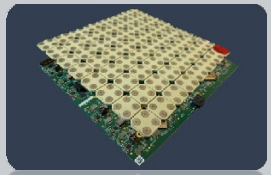
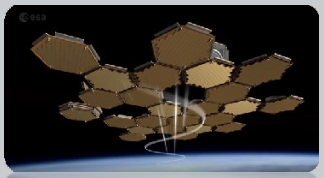
Technology Push

Direct Negotiation

Market Pull


ADVANCED
TECHNOLOGY
ESA-initiated

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
	 	 	 	 	 
Multifrequency communication techniques from VHS to mm-wave; Devices, Equipments and Systems from mW to kW power range.	Efficient and scalable digital signal processing enabling (Secure) Software Defined Systems; Virtualization; HPC and orchestration hardware and techniques.	Optical and quantum devices, systems, techniques and equipment for “Fibre in the Sky”, optical payloads and towards Quantum Internet.	Multifrequency, multi-beam antennas ready for volume production. Large lightweight, stowable reflectors.	Stackable, orbit specific, demisible satellite platforms and sub-systems ready for volume production and batch launch.	Digital twins; AR supported design; Advanced Materials; Green and sustainable volume production techniques.

ARTES Advanced Technology – ARTES AT

Up to 100% funded, open competition

ESA

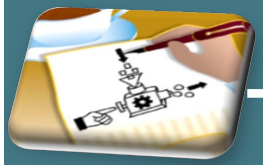
Yearly cut-off (in February)

~ 6 months

6-8 weeks

Evaluation and feedback

<5 weeks



ESA Call for Ideas (always open)

ESA Annual AT Workplan

Invitation to Tender (ITT)

Full Proposal (FP) Submission

Winning bid: Clarification & Negotiation

Contract

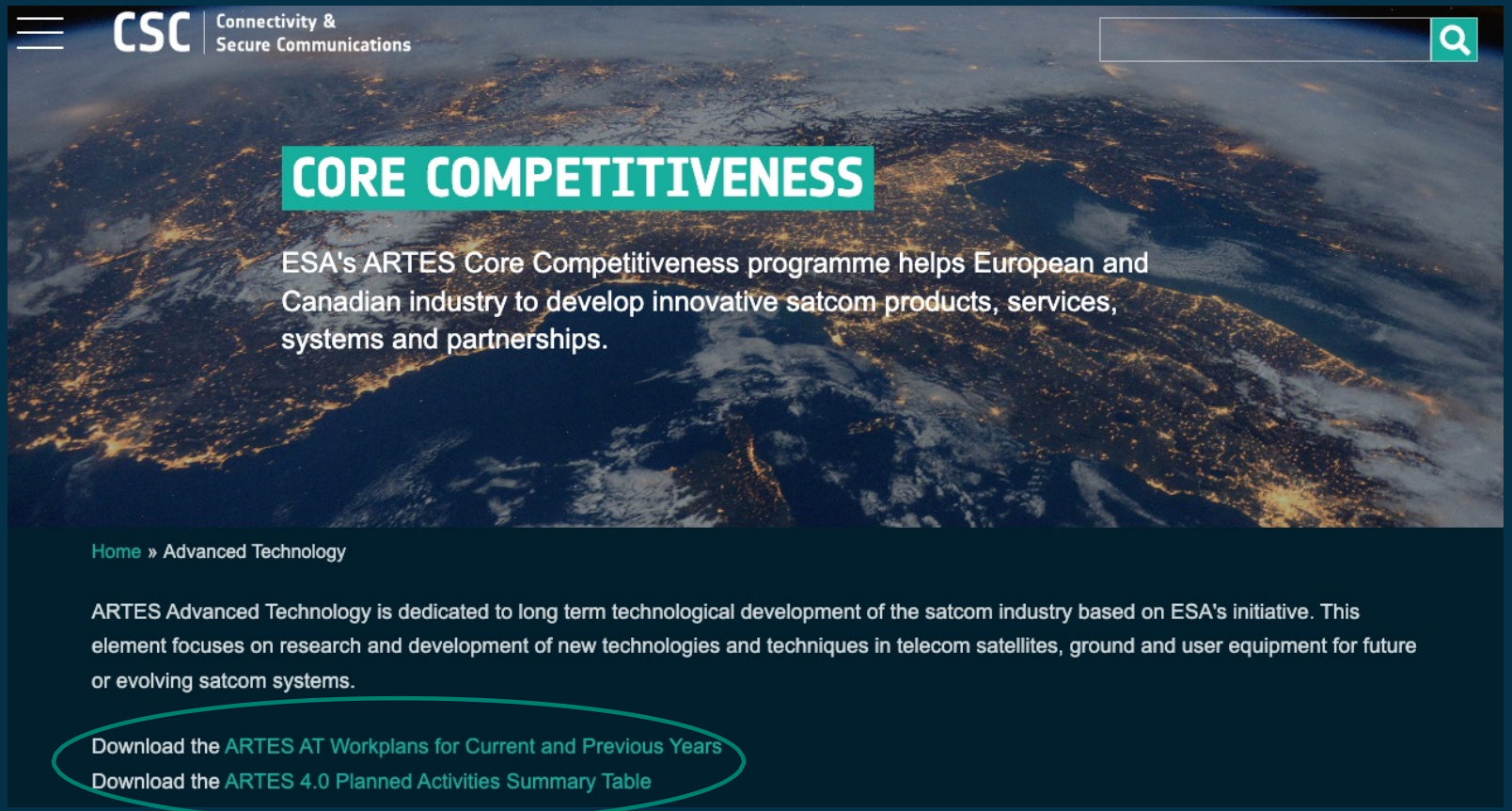
National Delegation

Industry Consults Delegation

Authorisation of Funding

ARTES 4.0 Advanced Technology (AT) Website

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

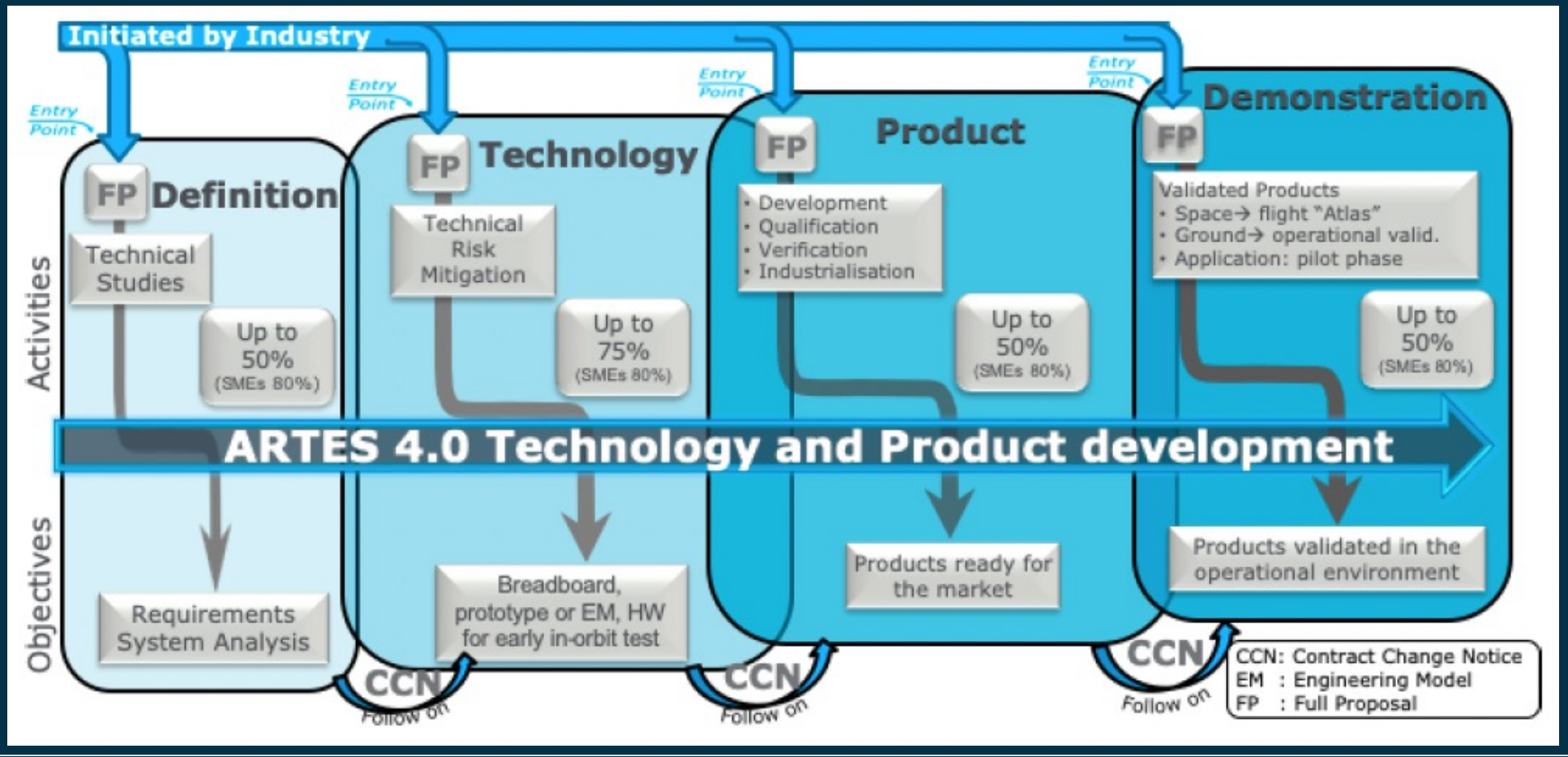


COMPETITIVENESS AND GROWTH

Industry-initiated

ARTES 4.0 Competitiveness & Growth: Development Phases

Initiated by Industry (Outline Proposal, Full Proposal)



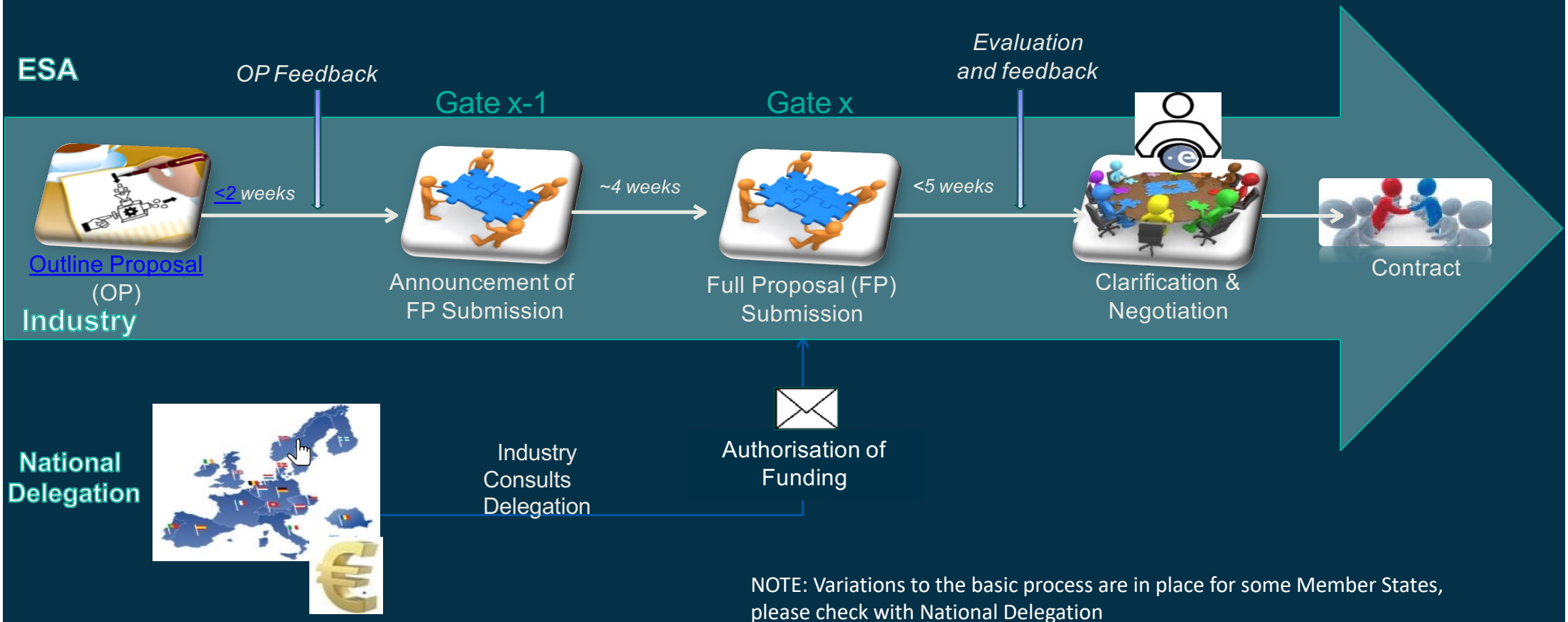
Funding Levels in ARTES C&G - Industry

C&G Development Phase		Funding level *up to*	
	Main goal(s)	*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%

Funding Levels in ARTES C&G - Institutions

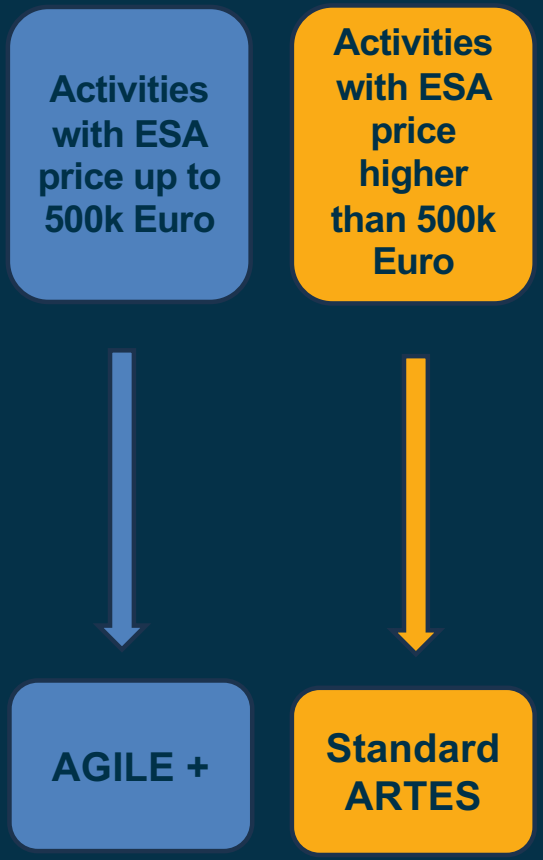
	Maximum Funding Level for Universities or Research Institutes		
ARTES C&G Development Phase	**With** commercial interest in the product (**Non-SME** status)	**With** commercial interest in the product (**SME** status)	**No** commercial interest in the product (up to 30% of the total contract cost)
Definition 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	Allowed under defined conditions
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

ESA

Feedback to industry

OP Evaluation

TEB Evaluation and feedback

<2 weeks

<2 weeks

<6 weeks

<4 weeks

<4 weeks

<2 weeks

Contract

Outline Proposal (OP)

Industry

Informal FP submission

Full Proposal (FP) Submission, ESA contract accepted

Clarification & Negotiation

National Delegation

Industry Consults Delegation

In principle support

Evaluation and approval AoF

Submission of FP within 3 months of FP invitation is mandatory

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

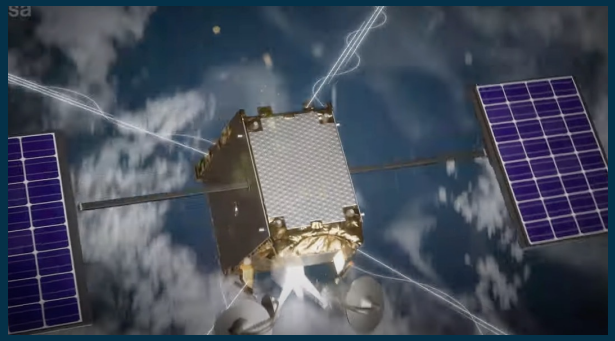
- 1 Cover Letter
- 2 Business Plan
- 3 Technical
- 4 Management
- 5* Implementation
- 6* Financial
- 7 Contractual

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