Clean Sky 2

Miriam de Angelis

Horizon 2020 National Contact Point for
'Smart green and integrated transport' & 'Clean Sky 2'

Agenzia per la Promozione della Ricerca Europea (APRE)

Clean Sky 2: developing new generations of greener aircraft

- Clean Sky is a **Joint Technology Initiative** (JTI), a public-private partnership between Europe's aeronautics industrial leaders, public research organisations, and the European Commission.
- It develops and demonstrates **break-through technologies for the civil aircraft market** to cut aircraft emissions and noise, and secure the future international competitiveness of the European aviation industry.
- CS2 JTI runs from 2014 to 2024.
- Clean Sky 2 stems from Clean Sky launched in 2008.

How is it run?

- CS2 JTI is managed by a **Joint Undertaking** whose Governing Board comprises representatives of the European Commission and Aeronautics Industry.
- 40% of the funds is earmarked for the **founding members** of CS2 who lead the technical programme and commit for the whole duration.
- 30% of the funds is allocated to **core partners**, selected through open calls at the start of the programme, which then became full Members of the Joint Undertaking.
- The remaining 30% of funding will be distributed in **annual open calls** to support the specific tasks.

Members of the CS2 Joint Undertaking

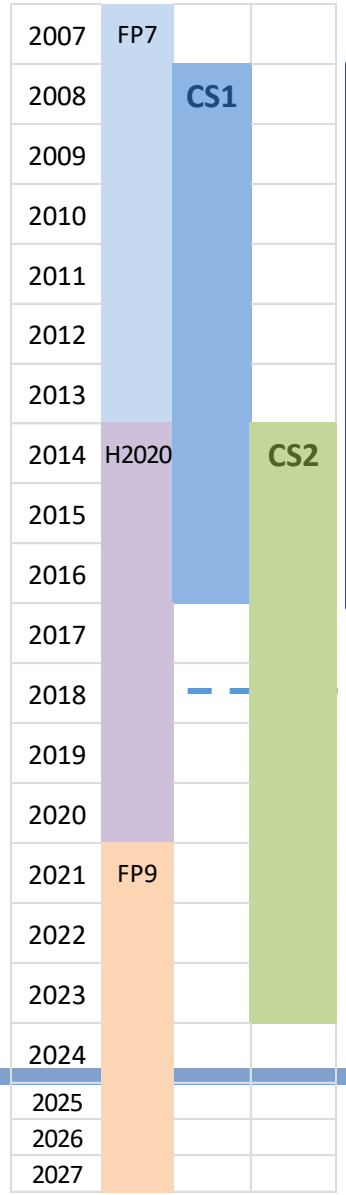
CS2 Objectives

- New environmentally friendly technologies for next generation Aviation:
  - increasing aircraft fuel efficiency, thus reducing CO2 emissions by between 20 to 30%; and
  - reducing aircraft NOx and noise emissions by between 20 to 30% compared to “state-of-the-art” aircraft.
- Speeding up development of technology demonstrators;
- Underpinning European international aviation competitiveness;

CS2 Budget

- CS2 budget is **€4 billion**:
  - The EU contributes ~€1.8 billion from the Horizon 2020 programme budget.
  - Industrial partners contribute ~€2.2 billion.

Clean Sky participation

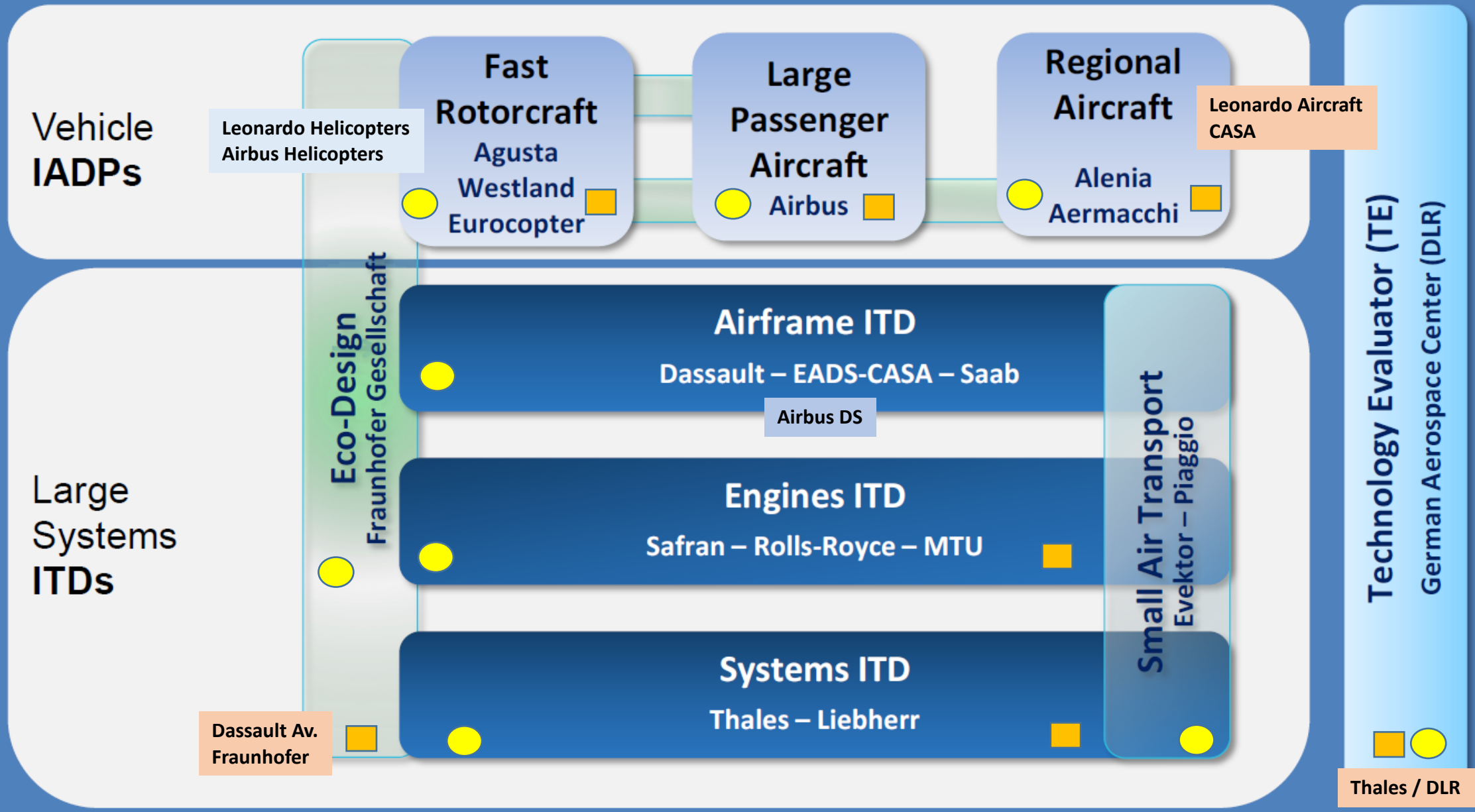


The Clean Sky 1 programme
(2008-2016)
funded 696 entities from 26 countries
and 105 EU regions
with approx. 780 M€

Clean Sky

The Clean Sky 2 programme
has funded so far (end 2018)
more than **650** entities from **27** countries
and **110** EU regions
with approx. **€ 1,05 billion** (Nov 2018)

Clean Sky Organisation



Clean Sky – (2008-2016) – 1.6 billion (800 mil from FP7, industry in kind)

Clean Sky 2 – (2014-2024) - 4 billion (1755 mil from H2020, industry in kind)

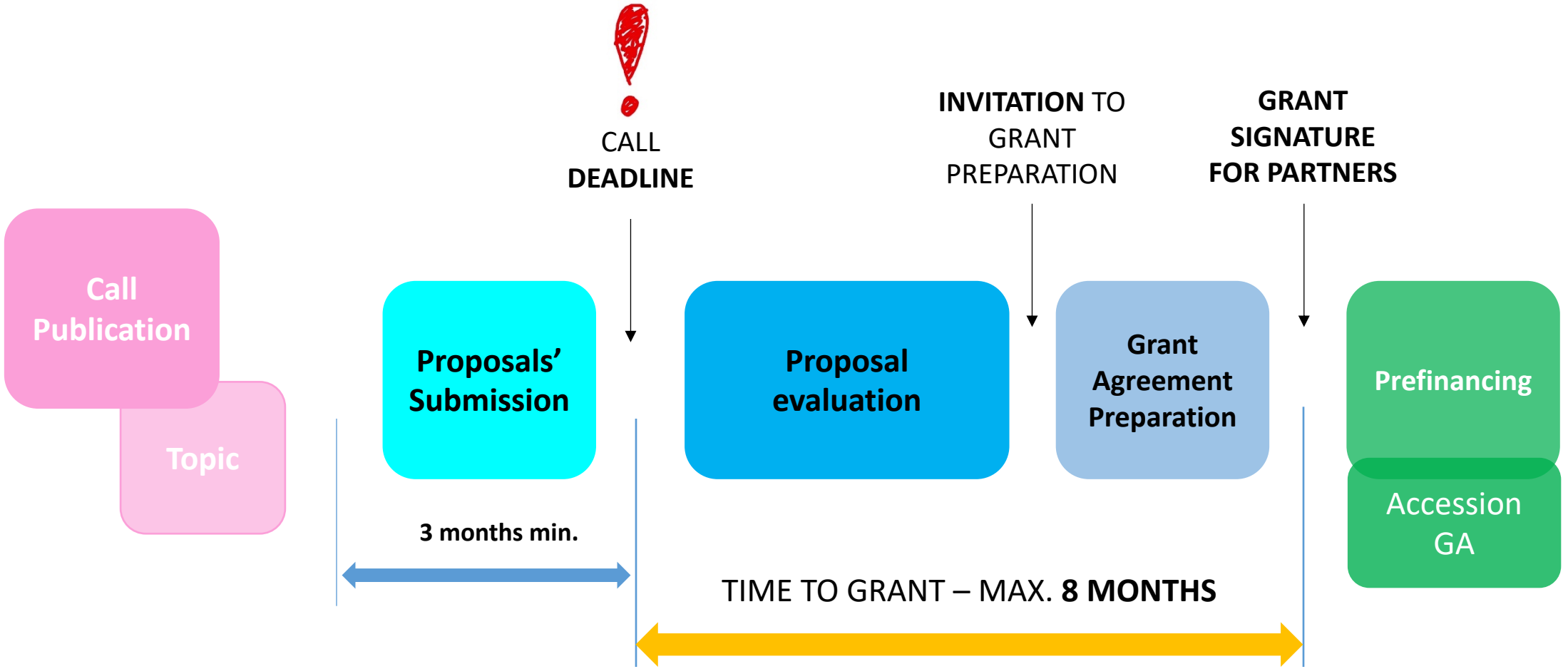
Clean Sky Overview

Clean Sky aims environmental improvement through developing and demonstrating clean aircraft technologies

	Clean Sky 1	Clean Sky 2
Nº of Demonstrators	28	37
EU funding in € million	800 (from FP7)	1 755 (from Horizon 2020)
	50% for actions of the Leaders	40% for actions of the Leaders
	25% for actions of the Associates	30% for actions of the Core Partners
	25% for actions for Partners	30% for actions for Partners
Private contribution in € million	600	2 193

50% rate

The Call for Proposals (CfP)



Topics

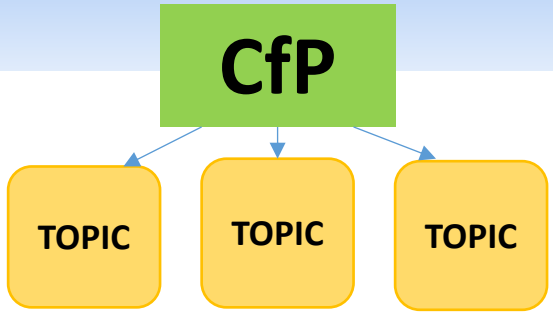
Funding and Tender Portal http://www …

TOPIC DESCRIPTION

Joint Technology Programme

2 years

Bi-annual Work Plan

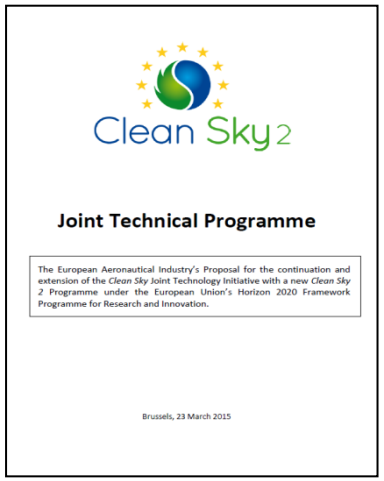


- Indicative topic value
- Exc.

Background documentation

Joint Technology Programme:

CS2 High Level Objectives

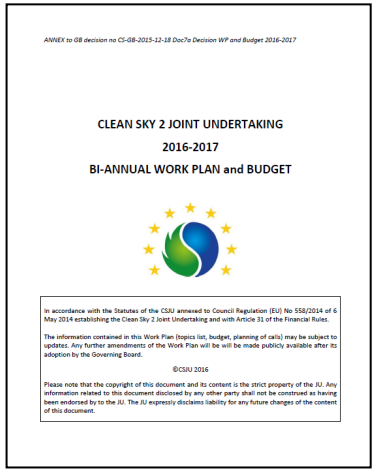

Clean Sky 2

Joint Technical Programme

The European Aeronautical Industry's Proposal for the continuation and extension of the *Clean Sky* Joint Technology Initiative with a new *Clean Sky 2* Programme under the European Union's Horizon 2020 Framework Programme for Research and Innovation.

Brussels, 23 March 2015

Objectives in the Bi-Annual **Work Plan**


ANNEX to GB decision no CS-GB-2015-12-18 Doc7a Decision WP and Budget 2016-2017

CLEAN SKY 2 JOINT UNDERTAKING

2016-2017

BI-ANNUAL WORK PLAN and BUDGET

In accordance with the Statutes of the CSJU annexed to Council Regulation (EU) No 558/2014 of 6 May 2014 establishing the Clean Sky 2 Joint Undertaking and with Article 31 of the Financial Rules.

The information contained in this Work Plan (topics list, budget, planning of calls) may be subject to updates. Any further amendments of the Work Plan will be will be made publicly available after its adoption by the Governing Board.

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Call for Proposals


Clean Sky 2

6th Call for Proposals (CFP06):
List and Full Description of Topics

Call Text

Topics

- **Complimentary topics**
- **Thematic topics**

All documents made available on the [Funding and Tender]

Type of topics

a. Complementary Topics

- CS2JU specificity
- Topics launched **inside** the complementary framework of one IADP/ITD/TA
- Directly linked to the action implemented by the Clean Sky 2 Members under grant agreements for members
- They contribute to the achievement of the results of specific ITD/IADP/TA.

b. Thematic Topics

- Topics launched **outside** the complementary framework of one IADP/ITD/TA
- Not directly linked to the action implemented by the Clean Sky 2 Members under specific ITD/IADP/TA
- They contribute to the achievement of the High Level Objectives (HLGs) of the Clean Sky 2 Regulation
- Different special conditions of admissibility apply to the thematic topics

The Topic description

The topic description

Type of action (RIA/IA/CSA):		IA	
Programme Area:		LPA	
(CS2 JTP 2015) WP Ref.:		WP 1.1	
Indicative Funding Topic Value (in k€):		600	
Topic Leader:	Airbus	**Type of Agreement:**	Implementation Agreement
Duration of the action (in Months):	36	**Indicative Start Date (at the earliest)[6]:**	> Q1 2020

Topic Identification Code	**Title**
JTI-CS2-2019-CfP10-LPA-01-72	**Development of a distributed CFD platform for collaborative design**

Short description
Development of an open-source CFD simulation platform and methodology to enable co-design between an airframe manufacturer and an engine manufacturer, while maintaining IP and IT security. This includes code-to-code coupling, communication between different simulation platforms, post processing of the simulation, and demonstration on industrial configuration.

Links to the Clean Sky 2 Programme High-level Objectives[7]	
This topic is located in the demonstration area:	Advanced Engine/Airframe Architectures
The outcome of the project will mainly contribute to the following conceptual aircraft/air transport type as presented in the scene setter:	Advanced Long-range Ultra-advanced Long-range Advanced Short/Medium-range Ultra-advanced Short/Medium-range

With expected impacts related to the Programme high-level objectives:				
Reducing CO_2 emissions	**Reducing NO_x emissions**	**Reducing Noise emissions**	**Improving EU Competitiveness**	**Improving Mobility**
☒	☐	☒	☐	☐

- **Type of action:**
  - Research and Innovation Action **(RIA)**
  - Innovation Action **(IA)**
- **Programme area:**
  - Large Passenger Aircraft IADP **(LPA)**
  - Regional IADP **(REG)**
  - Fast Rotorcraft IADP **(FRC)**
  - Airframe ITD **(AIR)**
  - Engines ITD **(ENG)**
  - Systems ITD **(SYS)**
  - **Thematic topics (THT)**
- **Indicative funding topic value:**
  - ~ 1m €
- **Topic Leader**
- **Duration** of the action
- Links to the Clean Sky 2 Programme High-level **Objectives** (from the Joint Technology Programme)

enterprise europe network
Business Support on Your Doorstep

Type of actions in CS2

RESEARCH AND INNOVATION ACTION (RIA)

Activities aiming to establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution. For this purpose they may include **basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment**.

Projects may contain closely connected but limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment.

Reimbursed up to 100% of eligible costs

INNOVATION ACTION (IA)

Activities like **prototyping, testing, demonstrating, piloting, large-scale product validation and market replication**.

Reimbursement of the 70% (except for non-profit legal entities, where a rate of 100% applies) of eligible costs

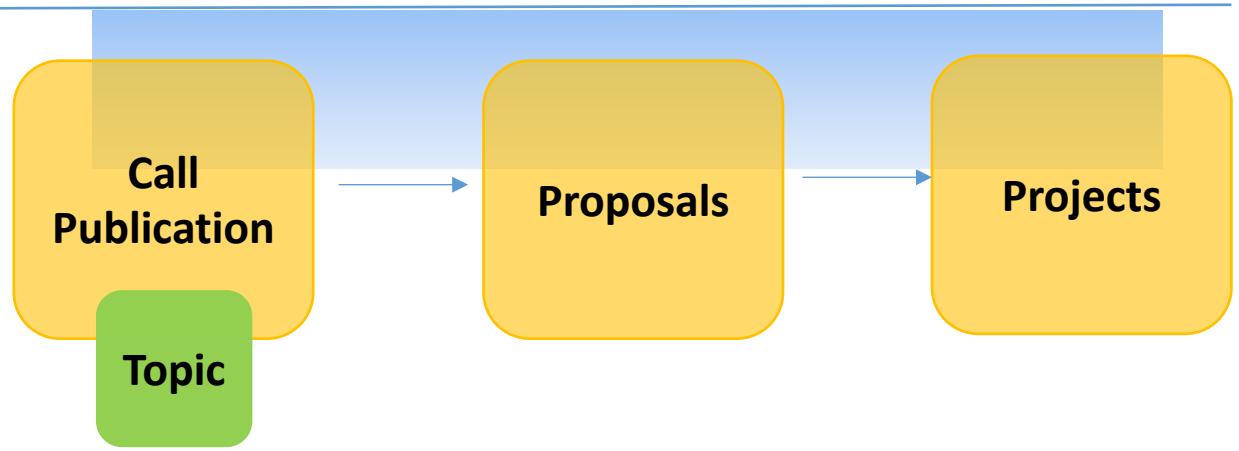
(Fonte: the **General Annexes to the Work Programme 2018-20**: http://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2018-2020/annexes/h2020-wp1820-annex-ga_en.pdf)

The topic leader

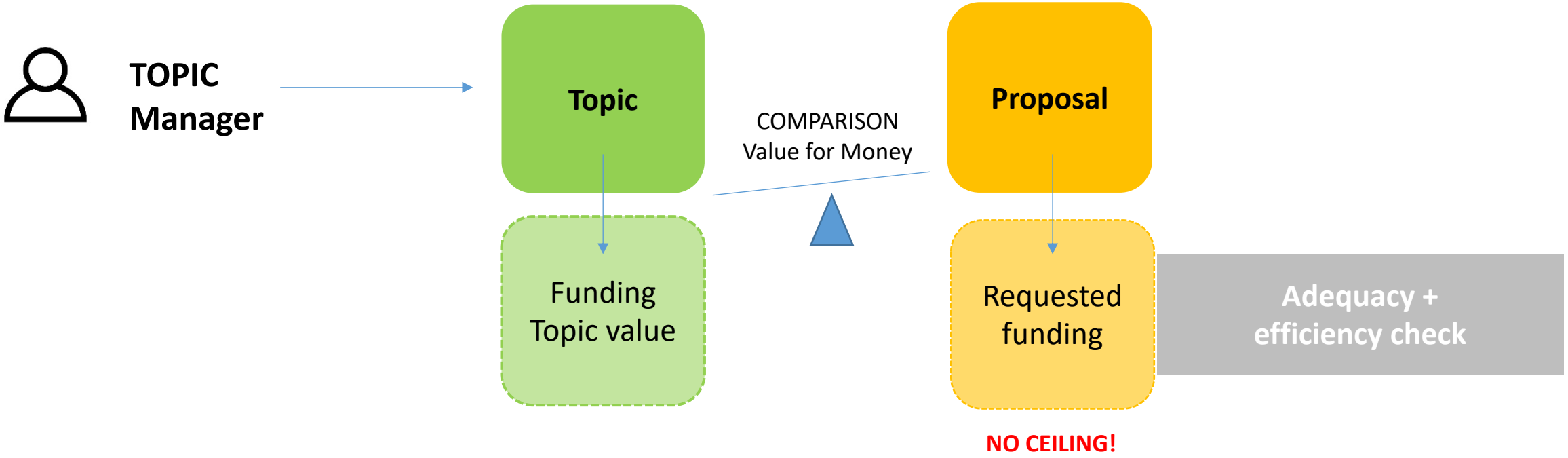
TOPIC Manager

represents the Member of the Joint Undertaking

monitors and follows the technical activity and ensures the linkage



Funding topic value



- The **topic funding value** is an estimate made by the topic manager who has written the topic.
- The applicants must fully address the scope of the topic and shall give both **requested funding** and **total eligible costs**, which will be evaluated in terms of '*Adequacy and efficiency of the allocation of the resources*'.
- The funding topic value is not mandatory. -> no ceiling shall be applied to the requested funding.
- In case of exceedance, the applicant mst justify its choice.

(Fonte: the **General Annexes to the Work Programme 2018-20**: http://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2018-2020/annexes/h2020-wp1820-annex-ga_en.pdf)

1. Background

It is now a common knowledge that the commercial aircraft industry is putting a lot of efforts toward the reduction of aircraft fuel burn and pollutant emissions. The research that is conducted in this regard is of particular importance to respect environmental constraints and to keep producing competitive airplanes.

As a matter of fact, the average commercial aircraft fuel efficiency has approximately doubled between 1960 and 2010. This can be explained by a number of factors, among which improved aircraft aerodynamics at transonic Mach numbers, improved materials, and better engines. Although further progress may be achieved both in terms of external aerodynamics (laminar wings / fuselage, riblets) or in terms of systems and structure (electric deicing, composite materials), large improvements will be obtained by working on the powerplant and its integration to the aircraft.

For instance, an engine with a lower Fan Pressure Ratio (FPR), and higher mass flow rate is more efficient and allows to decrease noise emissions, but that also involves larger fan diameters. This explains the current efforts to increase thebypass ratio (BPR) of civil aircraft engines, hence the « Ultra High Bypass Ratio » (UHBR)denomination for future turbofan engines. However, a larger fan diameter also results in a larger casing, which leads to increased nacelle weight and drag penalties.
To take advantage of the future generation of turbofan engines, innovative nacelle designs must thus be examined. For instance, one possibility is to consider shorter and thinner inlet lips. However, this approach leads to increased aerodynamic interactions between the air intake and the fan, which is no longer shielded from the external flow. To ensure a proper operation of both fan and air intake in the whole flight envelope of the aircraft these interactions must be mastered early in the design process of both components. On the long term, new propulsion paradigms must be envisioned to further decrease fuel burn. For instance, the Boundary Layer Ingestion (BLI) concept consists in embedding the engines and the airframe together so that the engines ingest a portion of the airframe boundary layer, which decreases wake drag penalties. In this kind of configuration, the aircraft and the engines are fully coupled, as the fans operate under distorted inflow, and as the pressure distributions on the airframe are affected by the fans. Designing such an aircraft requires a characterization of these interactions, and numerical capabilities that capture the effect of each component on the others.

From the numerical standpoint, it is possible to capture fan-airframe interactions with high fidelity CFD simulations in which both fan and airframe are represented. However, fan and airframe design involve different sets of skills, so that fan geometries are usually not available to institutions or companies designing airframes, and reciprocally airframes are not available to institutions or companies designing fans. It is thus required to develop numerical capabilities that allow producing such a simulation, while preserving intellectual property and IT security across different entities.

2. Scope of work

The objective of the work is to develop and to setup an open-source collaborative co-simulation platform that could be used by both academia and industry to simulate separate aircraft components (such as a fan and an airframe) designed by separate entities, in a unique CFD simulation, while ensuring that intellectual property is protected. This involves code-to-code coupling, communication between two private networks, and post processing of the simulation.

Tasks		
Ref. No.	***Title – Description***	***Due Date***
WP1	**Code-to-Code coupling for co-simulation in a single organization**	M0+18
WP1.1	Coupling between two instances of a CFD solver (solver A)	
WP1.2	Coupling between CFD solver A and another CFD solver (solver B)	
WP1.3	Coupling between solver A or solver B and a CFD solver used in production at Airbus different from solvers A and B	
WP2	**Aerodynamic and Aeroacoustic post processing solutions for the analysis of the result of the cosimulation**	M0+24
WP2.1	Effect of the powerplant on the airframe	
WP2.2	Effect of the airframe on the powerplant installation	
WP2.3	Extension to co-processing	
WP3	**Demonstration of the co-simulation platform on an industrial configuration in multiple organizations**	M0+36
WP 3.1	Generic preliminary works	
WP 3.2	Faisibility Demonstration	
WP 3.3	User interface	
WP 3.4	Application to industrial configuration and design trade-study	

WP1 – Code-to-Code coupling for co-simulation in a single organization
The objective of this workpackage is to demonstrate the code-to-code coupling approach on a configuration representative of an industrial application, but without the constraint linked to working on separate networks (IT and IP management). The coupling shall be demonstrated on a 3D nacelle + fan configuration with a mesh discretization comparing to the one used in production by Airbus. The coupling shall work in fully parallelized mode. Finally, the interfaces between engine and airframe must be completely conservative, i.e. mass flow rate, momentum and energy losses < 0.1%.
Key competences: Advanced computational fluid dynamics, numerical methods, code to code coupling.
WP1.1 : Coupling between instances of the same CFD solver (solver A)
This activity will consist in demonstrating the possibility of coupling two separate instances of a given CFD solver (used in aeronautics for resarch actvities). The coupling will be realized via a dedicated boundary condition that will allow an easy interfacing of those two instances.
WP1.2 : Coupling between CFD solver A and another CFD solver (solver B)
This activity will consist in extending the capability developed in WP1.1 to set-up a coupling between two different solvers. The solvers should be of different type (used for instance by different institutions) to demonstrate the genericity of the coupling platform.
WP1.3 : Coupling between solver A or solver B and a CFD solver used in production at Airbus different from solvers A and B
This second activity will focus on demonstrating the adequacy of the coupling platform by coupling either solver A or B with a solver used in production at Airbus. This is a requirement to demonstrate the viability of the solution in WP3.

WP2 – Aerodynamic and Aeroacoustic post processing solutions for the analysis of the result of the cosimulation
The objective of this workpackage is to develop post processing solutions adapted to the analysis of the advanced fan-airframe simulations realized thanks to the code-to-code coupling. These solutions must adress both aerodynamic and aeroacoustic requirements.
Key competences: Turbomachinery simulation, aircraft simulation, aero-acoustics, post processing

- Background
- Scope of work
- Tasks

3. Major Deliverables/ Milestones and schedule (estimate)

Schedule		Year1				Year2				Year3			
	Task	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WP1	**Code-to-Code coupling for co-simulation in a single organization**												
WP1.1	Coupling between two instances of a CFD solver (solver A)												
WP1.2	Coupling between CFD solver A and another CFD solver (solver B)												
WP1.3	Coupling between solver A or solver B and a CFD solver used in production at Airbus (different from solvers A and B)												
WP2	**Aerodynamic and Aeroacoustic post processing solutions for the analysis of the result of the cosimulation**												
WP2.1	Effect of the powerplant on the airframe												
WP2.2	Effect of the airframe on the powerplant installation												
WP2.3	Extension to co-processing												
WP3	**Demonstration of the co-simulation platform on an industrial configuration in multiple organizations**												
WP3.1	Generic preliminary works												
WP3.2	Feasibility Demonstration												
WP3.3	User interface												
WP3.4	Application to industrial configuration and design trade-study												

Deliverables			
Ref. No.	**Title - Description**	**Type***	**Due Date**
D1.1	Coupling Two instances of CFD solver (solver A)	Software Doc/Demo	M0+6
D1.2	Coupling Solver A with another CFD solver (solver B)	Software Doc/Demo	M0+12
D1.3	Coupling solver A or Solver B with CFD solver used in Airbus (different of solvers A and B)	Software Doc/Demo	M0+18
D2.1	Effect of the powerplant on the airframe	Software Doc/Data	M0+21
D2.2	Effect of the airframe on the powerplant inst.	Software Doc/Data	M0+21
D2.3	Extension to co-processing	Software Doc/Data	M0+24
D3.1	Generic preliminary works	Software Report	M0+24
D3.2	Feasibility Demonstration	Demo	M0+30
D3.3	User interface	Software Doc/Demo	M0+36
D3.4	Application to industrial configuration and design trade-study	Demo	M0+36

Milestones (when appropriate)			
Ref. No.	**Title - Description**	**Type***	**Due Date**
M1	Review of detailed work plan for all tasks (Kick off)	Meeting	M0
M2	First Coupling activities and post-processing prototype	Demo	M0+12
M3	Coupling and post-processing demonstration	Demo Data	M0+24
M4	Final integration of the full environment Application to industrial configuration review	Meeting Demo	M0+36

4. Special skills, Capabilities, Certification expected from the Applicant(s)

Demonstrated capabilities in:

- Code-to-Code coupling
- Networks & IT
- Advanced high fidelity computational aerodynamic modelling for turbomachinery and aircraft simulations
- Advanced aerodynamic and aero-acoustic post processing
- Fan design and / or aircraft design
- Understanding of fan-airframe interactions

All the capabilities developed in the frame of this project should be generic enough to be readily usable by any entity and as such they should be compatible with Airbus environment, as Airbus will participate to the validation of the platform in WP 3.X

5. Abbreviations

CFD	Computational Fluid Dynamics
IP	Intellectual Property
IT	Information and Technology
HPC	High Performance Computing

- **Deliverables/milestones**
- **Special skills, capabilities, certification expected frm the applicant(s)**

The topic description

- The scope and perimeter of activities is defined from the beginning and might be of various type (study, design, simulation, development, manufacturing, integration etc.);
- The activities are limited in time and closely related to the needs as proposed by IADP/ITD Steering Committees and approved by the CS2JU;
- The activity is defined and will be technically lead by the Topic Manager following the technical roadmap/goals of the ITD/IADP.

Rules for participation

Eligibility conditions

Who?

- Single entity 
- Consortium 
- Cluster 

From where?

- EU Member States
- H2020 Assciated countries
- Third countries

Applicants must include a minimum of one legal entity established in an EU member state or a country which is an associated of the Horizon 2020 programme.

Complementary topics: admissibility conditions

- **The 16 CS2JU Leaders and their affiliated entities under H2020 definition may apply to Calls for Proposals only in another IADP/ITD/TA** where they are not involved as Members.
  Status of affiliation + conflict of interest to be declared when applying

- **The Core partners and their affiliates entities may apply to calls for proposals only in another IADP/ITD/TA** where they are not involved as member.
  Status of affiliation + conflict of interest to be declared when applying

'**Affiliated entity'** means any legal entity that is under the direct or indirect control of a participant, or under the same direct or indirect control as the participant, or that is directly or indirectly controlling a participant [art.2, H2020 Rules for participation]

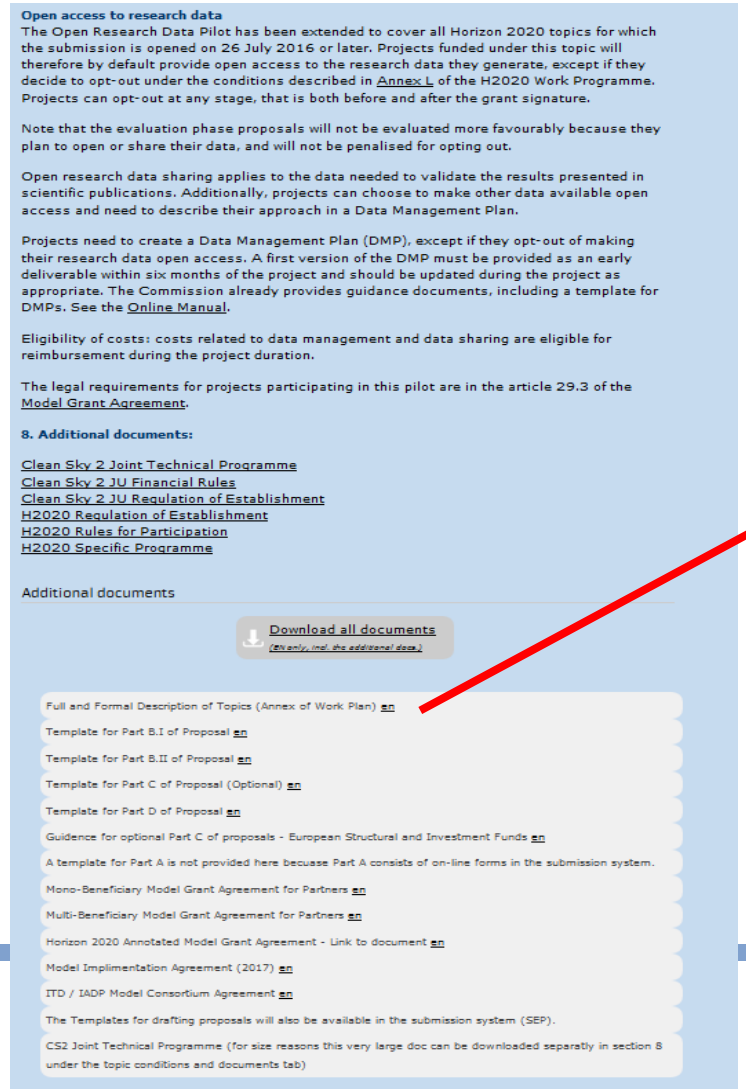
Thematic topics: specific admissibility condition

The following **special admissibility condition** applies to the Thematic topics:

"The 16 Leaders of the CS2JU listed in Annex II to Regulation n° (EU) No 558/2014 and their affiliates may not apply to the Thematic topics"

Documentation

Final and Valid Call documents via the **EC Funding and Tenders Portal**



Open access to research data
The Open Research Data Pilot has been extended to cover all Horizon 2020 topics for which the submission is opened on 26 July 2016 or later. Projects funded under this topic will therefore by default provide open access to the research data they generate, except if they decide to opt-out under the conditions described in Annex L of the H2020 Work Programme. Projects can opt-out at any stage, that is both before and after the grant signature.

Note that the evaluation phase proposals will not be evaluated more favourably because they plan to open or share their data, and will not be penalised for opting out.

Open research data sharing applies to the data needed to validate the results presented in scientific publications. Additionally, projects can choose to make other data available open access and need to describe their approach in a Data Management Plan.

Projects need to create a Data Management Plan (DMP), except if they opt-out of making their research data open access. A first version of the DMP must be provided as an early deliverable within six months of the project and should be updated during the project as appropriate. The Commission already provides guidance documents, including a template for DMPs. See the Online Manual.

Eligibility of costs: costs related to data management and data sharing are eligible for reimbursement during the project duration.

The legal requirements for projects participating in this pilot are in the article 29.3 of the Model Grant Agreement.

8. Additional documents:

Clean Sky 2 Joint Technical Programme
Clean Sky 2 JU Financial Rules
Clean Sky 2 JU Regulation of Establishment
H2020 Regulation of Establishment
H2020 Rules for Participation
H2020 Specific Programme

Additional documents

Download all documents
(ZIP only, incl. the additional docs.)

Full and Formal Description of Topics (Annex of Work Plan) en
Template for Part B.I of Proposal en
Template for Part B.II of Proposal en
Template for Part C of Proposal (Optional) en
Template for Part D of Proposal en
Guidence for optional Part C of proposals - European Structural and Investment Funds en
A template for Part A is not provided here because Part A consists of on-line forms in the submission system.
Mono-Beneficiary Model Grant Agreement for Partners en
Multi-Beneficiary Model Grant Agreement for Partners en
Horizon 2020 Annotated Model Grant Agreement - Link to document en
Model Implimentation Agreement (2017) en
ITD / IADP Model Consortium Agreement en
The Templates for drafting proposals will also be available in the submission system (SEP).
CS2 Joint Technical Programme (for size reasons this very large doc can be downloaded separatly in section 8 under the topic conditions and documents tab)

Clean Sky 2

***Clean Sky 2* Joint Undertaking**

9th Call for Proposals (CfP09):
List and full description of Topics

Call Text

Important: For a valid application, only the Call documents published on the Participant Portal will be considered.

Note: Q&A Release nr. 1 already available via the Participant Portal !

APRE
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The Call for Proposal 10 (CfP10)

10th Call for Proposal (CfP10) at a glance

▪ Call Opening Date	07 May 2019
▪ Call Closure	Ago 2019**
▪ Evaluation Phase	Sept 2019**
▪ Q&A last publication*	Usually 1 month before Call Closure**
▪ Technical sessions & Grant preparation	~Q4 2019 – Q1 2020**
▪ Indicative Start date of activities	~Q4 2019**

**The Questions & Answers (Q&A) Period will open on the Call launch date via the via the H2020 Funding & Tenders Opportunities Portal. Questions received up until 05/07/2019 will be answered after analysis and published in the Q&A when appropriate. Several publications of Q/As are foreseen.*

***Indicative*

10th Call for Proposal at a glance

PART A: Call topics launched within the complementary framework of IADP/ITD/TA

1. Overview of number of topics and total indicative funding value per SPD

SPD Area	No. of topics	Ind. topic Funding (in M€)
IADP Large Passenger Aircraft	19	20.7
IADP Regional Aircraft	3	1.35
IADP Fast Rotorcraft	4	6.4
ITD Airframe	18	12.925
ITD Engines	2	2.350
ITD Systems	13	10.32
Small Air Transport related topics*	[2]	[1.10]
ECO Design related topics*	[1]	[1.75]
TOTAL	**59**	**54.045**

**TA related topics are proposed and embedded in the following SPDs and as follows: AIR ITD: 1 SAT topic, 0.48M€ ; SYS ITD: 1 SAT topic, 0.60M€ ; ENG ITD: 1 ECO topic, 1.75M€*

All the call documentation including the final list of topics and topic descriptions are available at this link

- Large Passenger Aircraft IADP

LPA – status 18/05/2019

Identification Code	Title	Type of Action	Value (Funding in M€)	Topic Leader
JTI-CS2-2019-CfP10-LPA-01-72	Development of a distributed CFD platform for collaborative design	IA	0.6	Airbus
JTI-CS2-2019-CfP10-LPA-01-73	Innovative Thrust Reverser Actuator System (ITRAS)	IA	0.9	Airbus
JTI-CS2-2019-CfP10-LPA-01-74	UHBR Engine Studies for Aircraft Operations and Economics	IA	0.5	Airbus
JTI-CS2-2019-CfP10-LPA-01-75	Advanced solutions for 2030+ UHBR Core Noise reduction	IA	2.5	Safran Aircraft Engines
JTI-CS2-2019-CfP10-LPA-01-76	Supporting implementation of 2030+ UHBR low noise fan technology solutions through enhanced modeling capabilities	IA	1.4	Safran Aircraft Engines
JTI-CS2-2019-CfP10-LPA-01-77	Advanced Pitch Control Mechanism TRL4 Demonstration	IA	3.5	Safran Aircraft Engines
JTI-CS2-2019-CfP10-LPA-01-78	Innovative turbine cavity swirl control systems through Additive Manufacturing	RIA	0.9	GE Avio
JTI-CS2-2019-CfP10-LPA-01-79	Development of multidisciplinary design tools for rapid concept design for aero engine components	IA	0.5	GKN
JTI-CS2-2019-CfP10-LPA-01-80	Rear fuselage and empennage shape optimization including anti-icing technologies	RIA	1.5	Airbus
JTI-CS2-2019-CfP10-LPA-01-81	Fiber reinforced thermoplastics manufacturing for stiffened, complex, double curved structures	IA	0.7	German Aerospace Center, DLR
JTI-CS2-2019-CfP10-LPA-01-82	Development of Thermoplastic press forming Tool for Advanced Rear End Closing Frame Prototype and Tooling 4.0 for Assembly and transportation of the Advanced Rear End Prototype.	IA	0.75	Aernnova

LPA – status 18/05/2019

Identification Code	Title		Type of Action	Value (Funding in M€)
JTI-CS2-2019-CfP10-LPA-01-83	Development and simulation of a forming process for LE HLFC wing outer skins	IA	1.3	Aernnova
JTI-CS2-2019-CfP10-LPA-01-84	Development of a manufacturing process and a manufacturing unit for production of a laser treated titanium panel with a 3D printed substructure	IA	1.5	Fraunhofer
JTI-CS2-2019-CfP10-LPA-01-85	Design and manufacturing of multi-functional Ice Protection System power feed/monitoring lines and Shielding/High-lift electrical actuation system for a HLFC Wing demonstrator	IA	0.7	SONACA
JTI-CS2-2019-CfP10-LPA-01-86	Develop and test Power Efficient Actuation Concepts for Separation Flow Control at large aerodynamic	IA	0.9	Airbus
JTI-CS2-2019-CfP10-LPA-02-30	Development of innovative welding systems for structural joints of Thermoplastic matrix based Composites	IA	0.75	Aernnova Composites Illescas
JTI-CS2-2019-CfP10-LPA-02-31	Development of short fibre reinforced thermoplastic airframe clips and brackets using factory waste	IA	0.5	Fokker
JTI-CS2-2019-CfP10-LPA-02-32	Innovative miniaturized sensing device for large wave length spectrum reception capability as a tool for quality control and aircraft maintenance	RIA	0.8	Airbus Operations
JTI-CS2-2019-CFP10-LPA: 19 topics			**20.70**	

- Regional Aircraft IADP

REG – status 18/05/2019

Identification Code	Title		Type of Action	Value (Funding in M€)
REG-01-18	field modification induced by flaws in loaded composite structures			Aircraft
JTI-CS2-2019-CFP10-REG-01-19	Innovative Noise Generation System for testing of Regional Cabin Interior Noise reduction	IA	0.55	Leonardo SpA - Aircraft
JTI-CS2-2019-CFP10-REG-02-06	SHMS and Dynamic fields sensors development	RIA	0.35	Airbus Defence & Space
JTI-CS2-2019-CFP10-REG: 3 topics			**1.35**	

- Fast Rotorcraft IADP

FRC – status 18/05/2019

Identification Code	Title		Type of Action	Value (Funding in M€)
JTI-CS2-2019-CFP10-FRC-01-28	Innovative kinematic analysis to incorporate multiple functions within a movable surface	RIA	0.50	Leonardo SpA Helicopter
JTI-CS2-2019-CFP10-FRC-01-29	Smart Active Inceptors System development for Tilt Rotor application	IA	3.50	Leonardo SpA Helicopter
JTI-CS2-2019-CFP10-FRC-01-30	Multipurpose bench for Tiltrotor equipment functional test	IA	0.80	Leonardo SpA Helicopter
JTI-CS2-2019-CFP10-FRC-01-31	Engine exhaust wake flow regulator for Tilt Rotor	IA	1.60	Leonardo SpA Helicopter
JTI-CS2-2019-CFP10-FRC: 4 topics			**6.40**	

- ITD Airframe

AIR – status 18/05/2019

Identification Code	Title		Type of Action	Value (Funding in M€)
JTI-CS2-2019-CFP10-AIR-01-41	Low speed handling quality and innovative engine integration of a new configuration aircraft	IA	0.70	Dassault Aviation
JTI-CS2-2019-CFP10-AIR-01-42	Development of a methodology (test, measurement, analysis) to characterize the behaviour of composite structures under dynamic loading	RIA	0.50	Dassault Aviation
JTI-CS2-2019-CFP10-AIR-01-43	Verification of advanced simplified HLFC concept with variable porosity	RIA	0.75	German Aerospace Center DLR
JTI-CS2-2019-CFP10-AIR-01-44	Development of a methodology to optimize a wing composite panel with respect to tyre damage certification requirement	RIA	1.40	Dassault Aviation
JTI-CS2-2019-CFP10-AIR-01-45	Coupon and element testing and manufacturing of test article for morphing technologies	IA	0.90	Fokker Aerostructures
JTI-CS2-2019-CFP10-AIR-02-77	Increasing the efficiency of pulsed jet actuators for flow separation control.	RIA	0.70	Airbus
JTI-CS2-2019-CFP10-AIR-02-78	Application of graphene based materials in aeronautical structures for de-icing, lightning strike protection, fire barrier and water absorption prevention purposes	IA	0.50	Leonardo SpA Aircraft
JTI-CS2-2019-CFP10-AIR-02-79	Development of FEM fastener parametric/adaptable sizing tool including EMC impact, and manufacturing and EMC/LSP testing of demonstrators [SAT]	IA	0.475	Evektor
JTI-CS2-2019-CFP10-AIR-02-80	Innovative flight data measurements to support the aerodynamic analysis of a compound helicopter demonstrator	IA	1.20	Airbus Helicopters

AIR – status 18/05/2019

Identification Code	Title		Type of Action	Value (Funding in M€)
JTI-CS2-2019-CFP10-AIR-02-81	Active Flow control on Tilt Rotor lifting surfaces	RIA	0.60	Leonardo SpA Helicopter
JTI-CS2-2019-CFP10-AIR-02-82	Innovative approaches for interior Noise Control for Next Generation Civil Tilt Rotor	RIA	0.65	Leonardo SpA Helicopter
JTI-CS2-2019-CFP10-AIR-02-83	Innovative weight measurement system for Tilt Rotor application	IA	0.80	Leonardo SpA Helicopter
JTI-CS2-2019-CFP10-AIR-02-84	Modular platform development for Tilt Rotor final assembly	IA	1.00	Leonardo SpA Helicopter
JTI-CS2-2019-CFP10-AIR-02-85	Development of a multifunctional system for complex aerostructures assembly, assisted by neural network softwares	IA	0.90	Leonardo SpA Aircraft
JTI-CS2-2019-CFP10-AIR-02-86	Development of equipment for composite recycling process of uncured material	IA	0.80	Leonardo SpA Aircraft
JTI-CS2-2019-CFP10-AIR-03-07	End of Life (EoL) for biomaterials	RIA	0.35	INVENT GmbH
JTI-CS2-2019-CFP10-AIR-03-08	Disassembly and recycling of innovative structures made of different Al-Li alloys	RIA	0.35	Aero-Magnesium
JTI-CS2-2019-CFP10-AIR-03-09	Scrapping of carbon reinforced thermoplastic materials	RIA	0.35	Netherlands Aerospace Centre
JTI-CS2-2019-CFP10-AIR: 18 topics			**12.925**	

- ITD Engines

ENG – status 18/05/2019

Identification Code	Title		Type of Action	Value (Funding in M€)
JTI-CS2-2019-CfP10-ENG-01-43	Low NOx / Low soot injection system design for spinning combustion technology	RIA	0.6	Safran Helicopter Engines
JTI-CS2-2019-CfP10-ENG-04-08	Revalorisation of Recycled Carbon Fibers and CFRP preparation through Eco design [ECO]	IA	1.75	Fraunhofer
JTI-CS2-2019-CFP10-ENG: 2 topics			**2.35**	

- ITD Systems

SYS – status 18/05/2019

Identification Code	Title		Type of Action	Value (Funding in M€)
JTI-CS2-2019-CfP10-SYS-01-15	Enhanced digital georeferenced data models for cockpit use	IA	1.00	Thales
JTI-CS2-2019-CfP10-SYS-01-16	Innovative processing for flight practices improvement	IA	0.60	Thales
JTI-CS2-2019-CfP10-SYS-01-17	New Efficient production methods for 94 GHz (W-band) waveguide antennas	IA	0.50	SAAB
JTI-CS2-2019-CfP10-SYS-01-18	Low-profile/drag electronically steerable antennas for In-Flight Connectivity	IA	1.40	Thales
JTI-CS2-2019-CfP10-SYS-01-19	VOC filtration device for Inerting System	IA	0.90	Zodiac Aerospace
JTI-CS2-2019-CfP10-SYS-01-20	Innovative high flow rate constant pressure valve for inert gas discharge from pressurized vessels	IA	0.70	Diehl Aviation
JTI-CS2-2019-CfP10-SYS-01-21	Grey Water Container with Reduced Biofilm Growth	IA	0.70	Diehl Aviation
JTI-CS2-2019-CfP10-SYS-02-58	Automatic Haptic System Test Bench for Active Inceptors	IA	0.70	Safran

SYS – status 18/05/2019

Identification Code	Title		Type of Action	Value (Funding in M€)
02-59	hybridization			
JTI-CS2-2019-CfP10-SYS-02-60	Toward a Digital Twin ECS and thermal management architecture models : Improvement of MODELICA libraries and usage of Deep Learning technics	IA	0.60	Liebherr
JTI-CS2-2019-CfP10-SYS-02-61	Vapor Cycle System - Heat Exchanger performance 3D modelization with different new low GWP refrigerants	RIA	1.20	Liebherr
JTI-CS2-2019-CfP10-SYS-03-23	Electro-Mechanical Landing Gear system integration for Small Aircraft [SAT]	IA	0.60	Piaggio Aero
JTI-CS2-2019-CfP10-SYS-03-24	Power Semiconductor Device module using Silicon Carbide devices for a relatively high-frequency, circa 100kW aircraft motor drive applications	IA	0.62	University of Nottingham
JTI-CS2-2019-CFP10-SYS: 13 topics			**10.32**	

- Thematic topics

THT – status 18/05/2019

Identification Code	Title	Type of Action	Value (Funding in M€)
JTI-CS2-2019-CFP10-THT-07	Ultra-High Aspect ratio wings	RIA	2.00
JTI-CS2-2019-CFP10-THT-08	Experimental and numerical noise assessment of distributed propulsion configurations	RIA	2.00
JTI-CS2-2019-CFP10-THT-09	Disruptive Active Flow Control for aircraft engine applications	RIA	1.50
JTI-CS2-2019-CFP10-THT-10	Non-intrusive, seedless measurement system: design, development, and testing	RIA	1.50