Introduction to the Clean Sky Joint Technology Initiative

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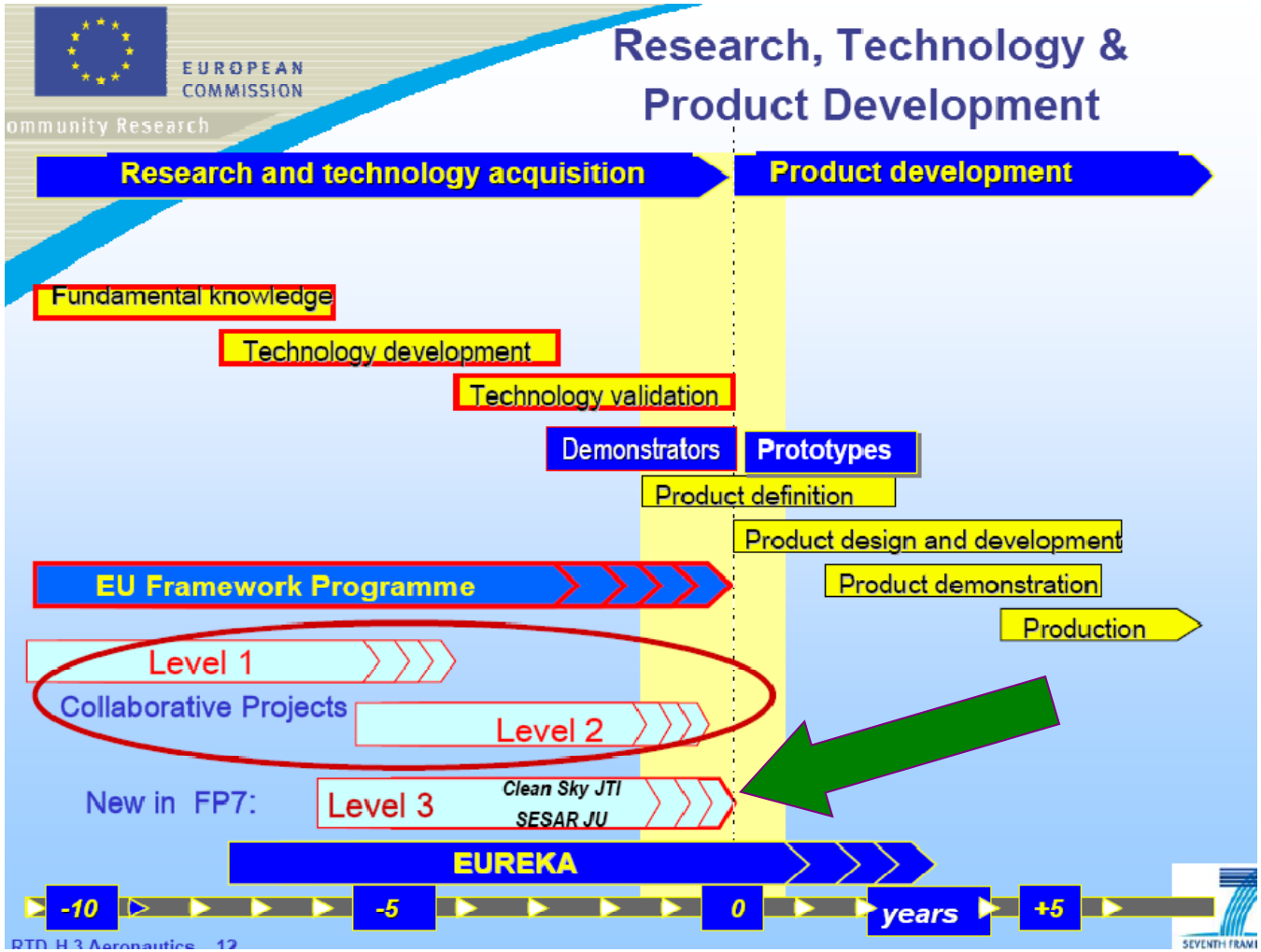
Clean Sky JU Coordinating Project Officer

Warsaw, Monday, 12 September 2011

Outline

1. JTI in FP7
2. ACARE and Clean Sky
3. What is Clean Sky
4. The Integrated Technology Demonstrators
5. ITD Interfaces
6. The Technology Evaluator
7. The Calls for Proposals
8. Final remarks

JTI in FP7



Level 3: closer to the market research, based on demonstrators of high technology readiness levels

ACARE and Clean Sky

Vision 2020 (January 2001)
- **To meet Society's needs**
- **To achieve global leadership for Europe**

ACARE

October 2002 : The Strategic Research Agenda (SRA) → 5 Challenges

- Quality and Affordability
- Environment
- Safety
- Air Transport System Efficiency
- Security

CLEAN SKY

October 2004 : The SRA 2 → High level Target Concepts

- Very Low Cost ATS
- Ultra Green ATS
- Highly Customer oriented ATS
- Highly time-efficient ATS
- Ultra Secure ATS
- 22nd Century

- **80% cut in NOx emissions**
- **Halving perceived aircraft noise**
- **50% cut in CO2 emissions per pass-Km by drastic fuel consumption reduction**
- **A green design, manufacturing, maintenance and disposal product life cycle**

ACARE (Advisory Council for Aeronautical Research in Europe)

The Clean Sky Joint Technology initiative

It is a **Public-Private Partnership** between Commission and Industry implementing the Level 3 project approach of FP7

Starting date: 02/2008

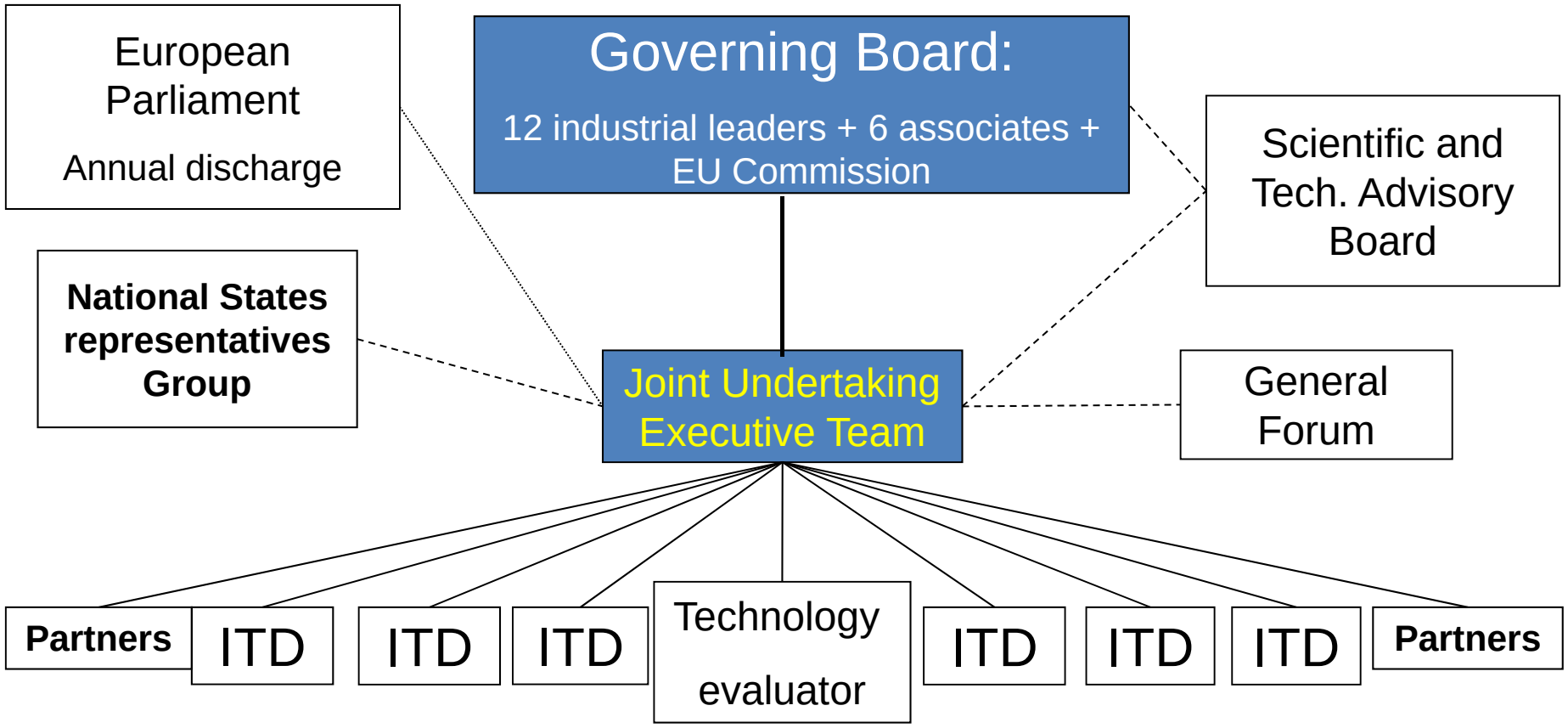
Multi-year research project on Greening of Aeronautics: 2008-2015

Total budget 1.6 billion €

- **800 million € from Commission in-cash**
- 800 million € from industry in-kind

Since Nov 2009 an independent legal entity (the Clean Sky Joint Undertaking), with own staff of 24, placing the contracts / grant agreements and coordinating the programme

Governance

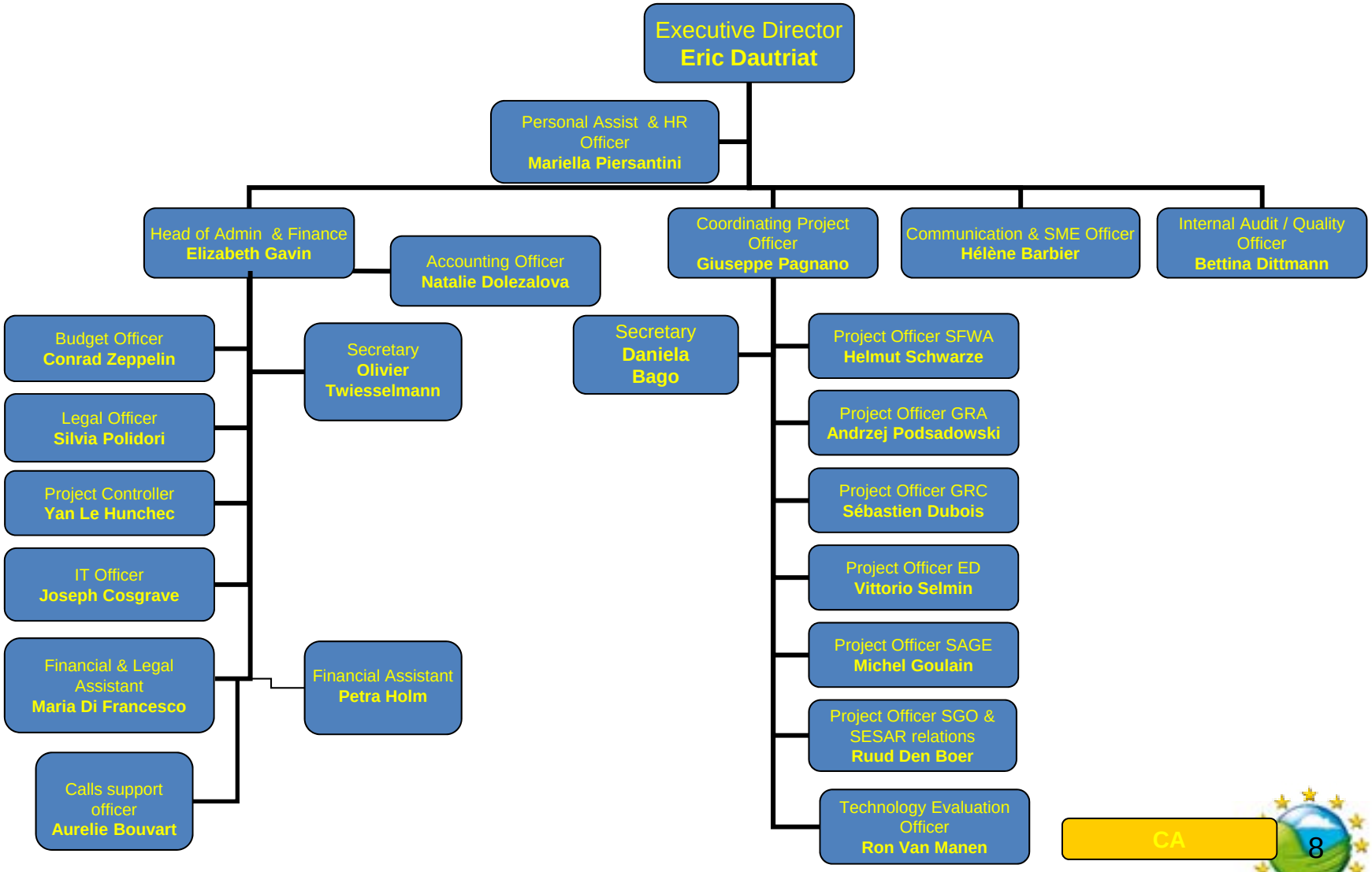


ITD: integrated Technology Demonstrator

How does it work?

- EU funding transferred to the JU directly annually
- JU responsible for planning, distributing and monitoring implementation of grant agreements it signs
- 4 Governing Board meetings per year
- Regular meetings between JU and ITD coordinators/ annual technical review meetings/annual reporting etc…
- Audited at least twice per year by the European Court of Auditors….
- The Executive Director is responsible towards European Parliament and Council for all funds…..and overall management of the programme
- 24 staff in the JU team currently divided in 2 main sectors – Projects and Admin & Finance

The Clean Sky Team….



Split of the EC Contribution

Maximum Overall EC Contribution: 800 M€

Members (max. 600 M€ i.e. 75%)

ITD Leaders
(max 400 M€ i.e. 50%)

match EC contribution 50% (in-kind)

Associates
(max 200 M€ i.e. 25%)

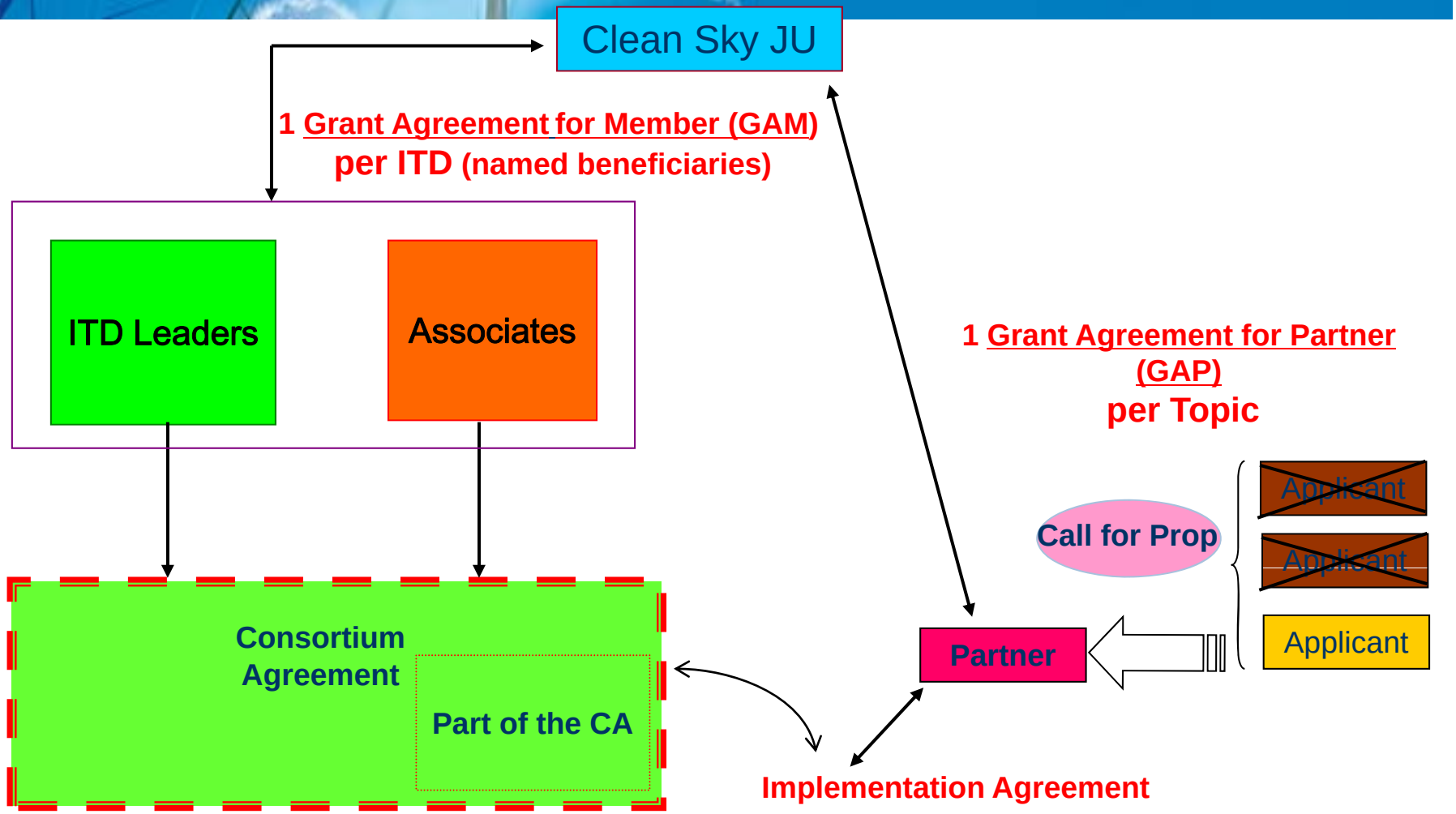
match EC contribution 50% (in-kind)

Partners
(min 200 M€ i.e.25%)

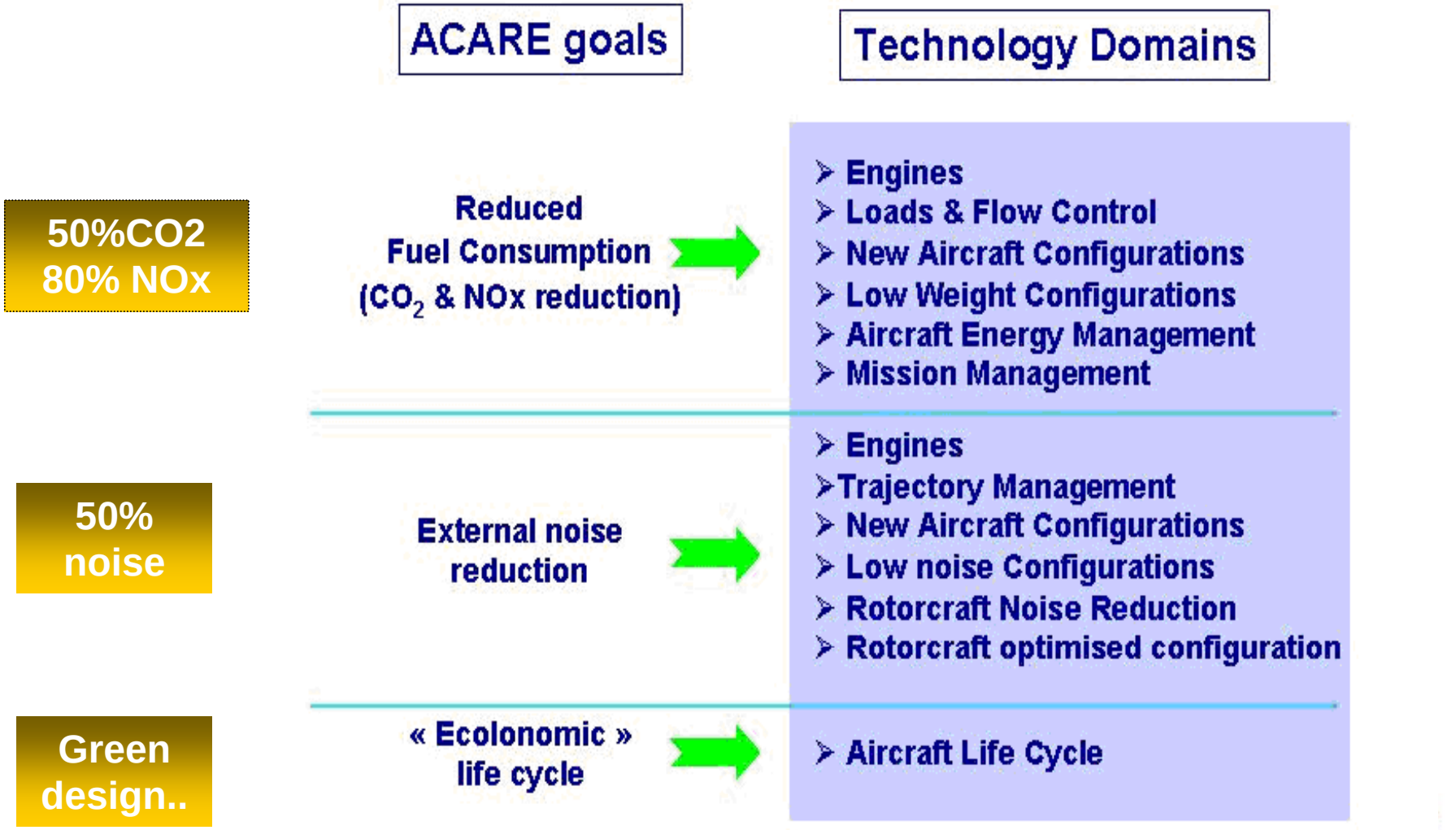
Call for Proposals

- **10 Calls published**
- **More than 300 topics**
- **About 100 M€ funding**
- **More than 400 beneficiaries**
- **40 % SMEs**

CLEAN SKY – Grant Agreements



Reaching the ACARE Goals

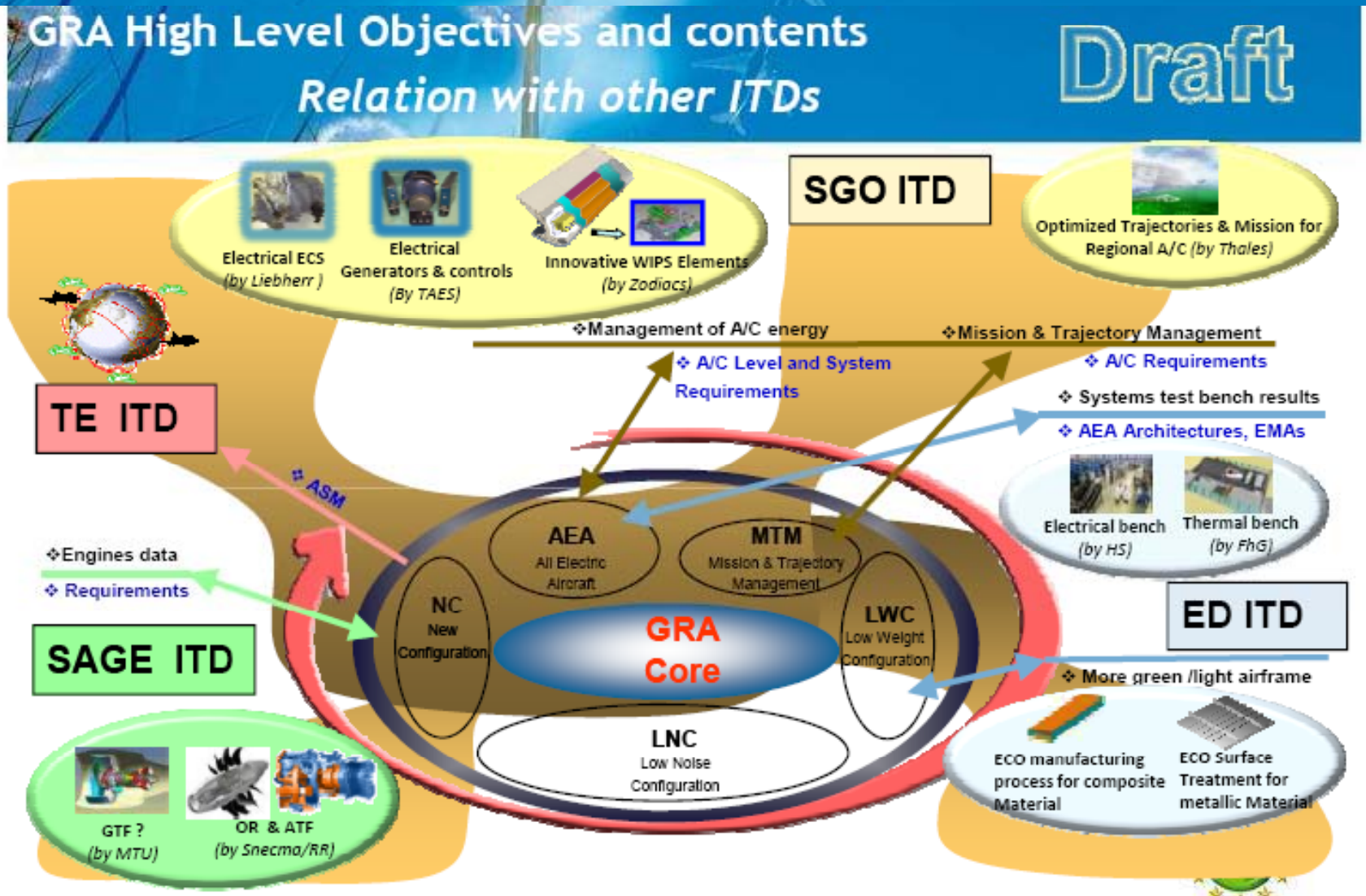


Clean Sky Integrated Technology Demonstrators (ITD)

Smart Fixed Wing Aircraft
Airbus (F, D, UK, E)
SAAB (SE)
Green Regional Aircraft
Alenia Aeronautica (I)
EADS CASA (E)
Green Rotorcraft
AgustaWestland (I, UK)
Eurocopter (F, D)
Sustainable and Green Engines
Rolls-Royce (UK, D)
Safran (F)
Systems for Green Operation
Thales (F)
Liebherr (D)
Ecodesign
Dassault Aviation (F)
Fraunhofer Gesellschaft (D)

Technolgy Evaluator
Thales
DLR

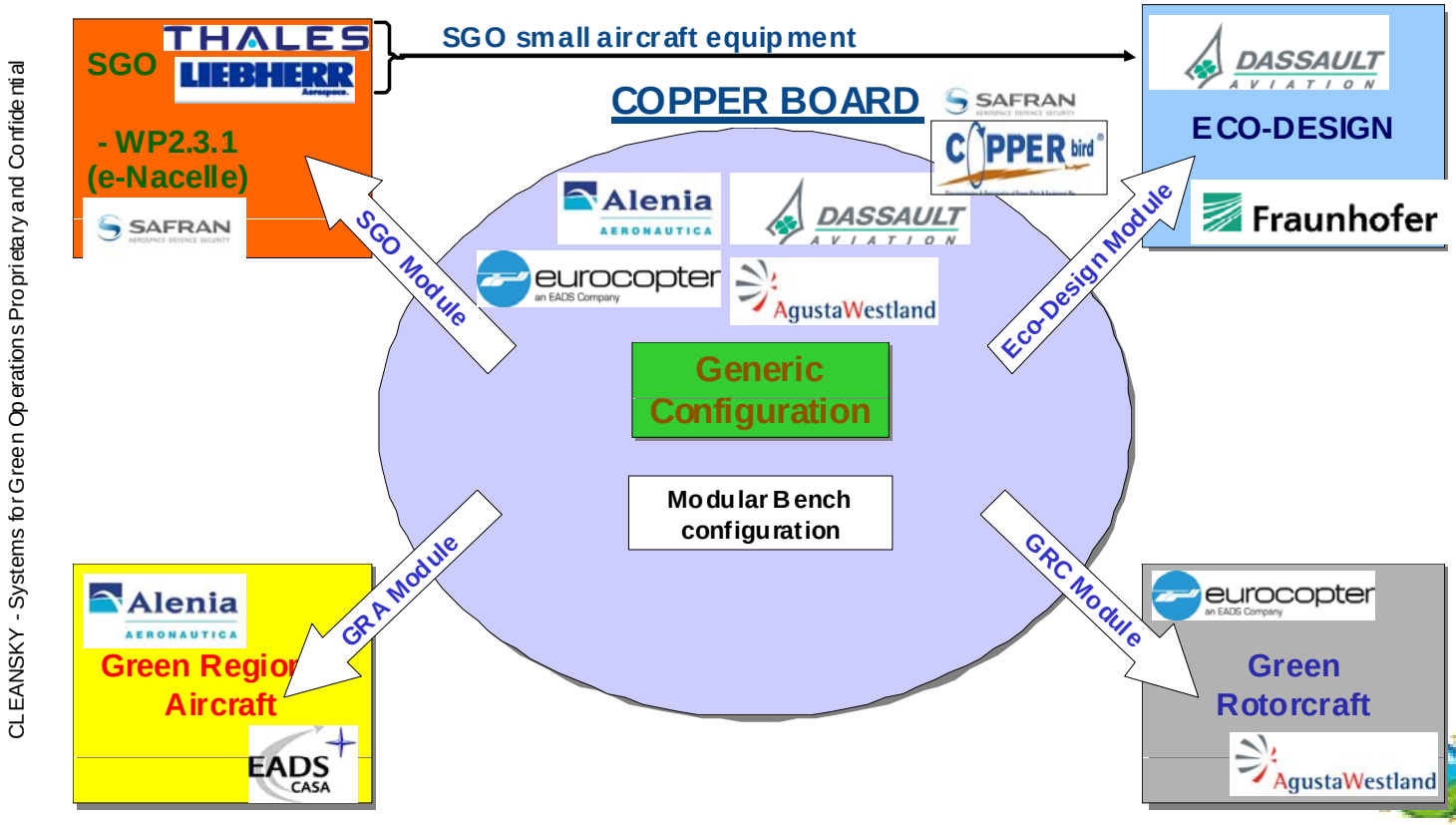
ITD interfaces and interactions



SGO Management of Aircraft Energy

COPPER Bird® - Trans ITD test Bench

❖ **CLEANSKY Trans-ITD Activities :**



Smart Fixed Wing Aircraft

Links with:

"Sustainable and Green Engines" – ITD
CROR engine

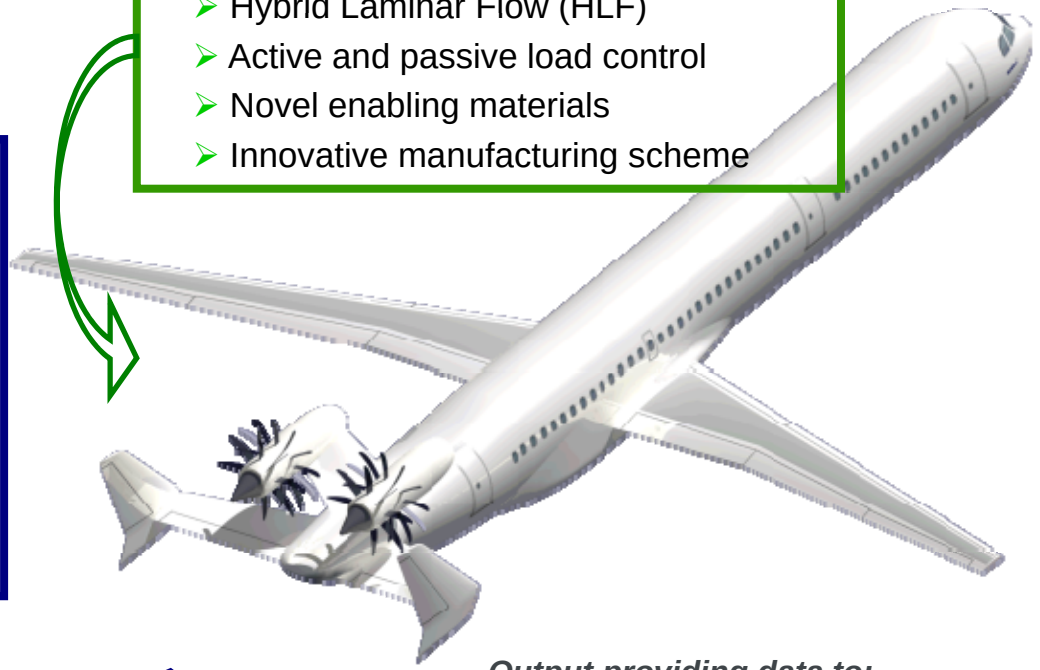
"System for Green Operation" – ITD"
Management of Aircraft /
Management of Trajectories and Missions

Smart Wing Technologies

- **Technology Development**
- **Technology Integration**
- **Large Scale Flight Demonstration**
  - Natural Laminar Flow (NLF)
  - Hybrid Laminar Flow (HLF)
  - Active and passive load control
  - Novel enabling materials
  - Innovative manufacturing scheme

Innovative Powerplant Integration

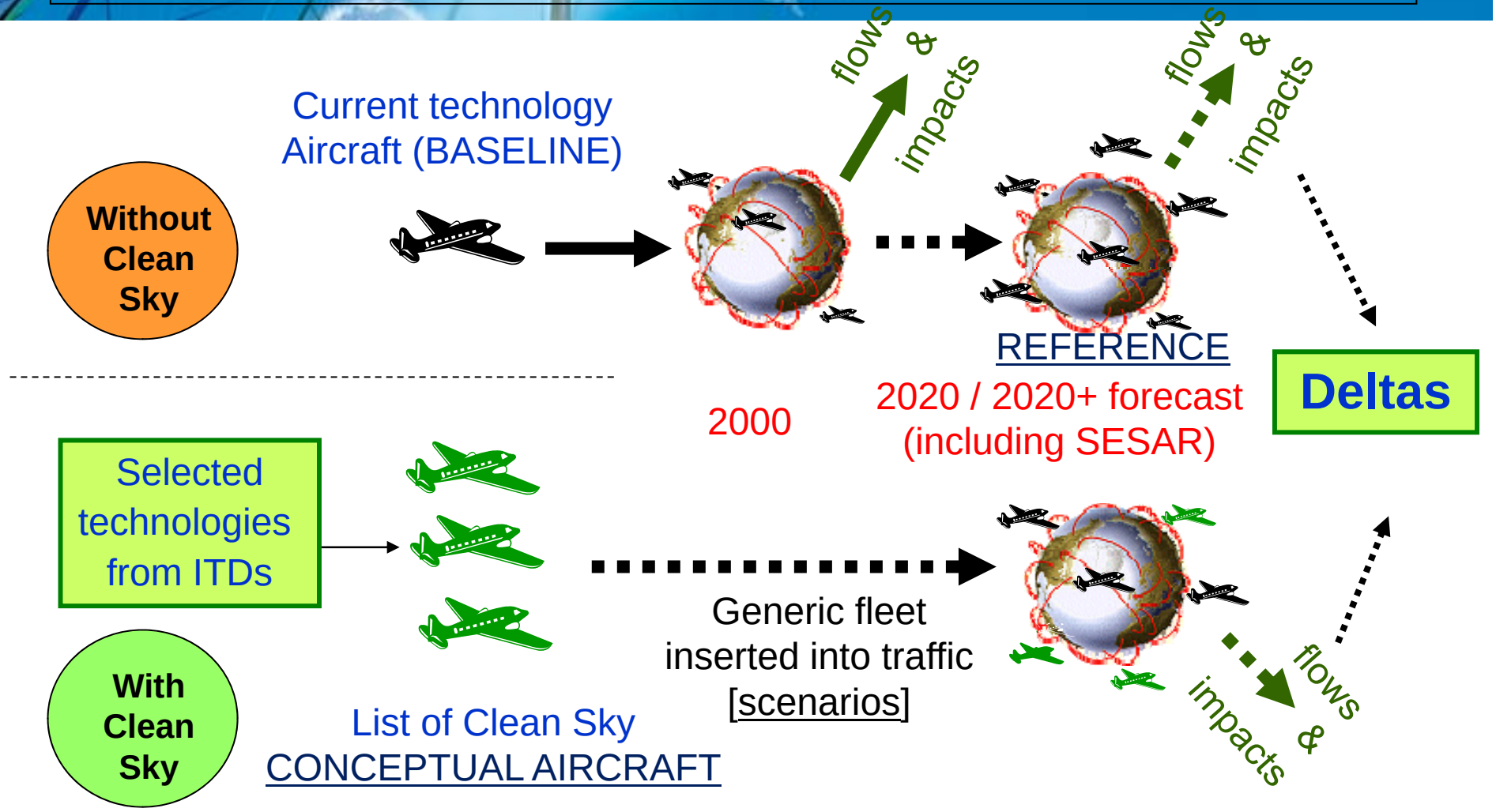
- **Technology Integration**
- **Large Scale Flight Demonstration**
  - Impact of airframe flow field on Propeller design (acoustic, aerodynamic, vibration)
  - Impact of open rotor configuration on airframe (Certification capabilities, structure, vibrations...)
  - Innovative empennage design



Output providing data to:

CleanSky **Technology Evaluator**
SFWA technologies for a Green Air Transport System

Principle of Technology Evaluator assessment



Calls for Proposals

Peculiarities of Clean Sky CFPs

1. TOPICS instead of research themes, defined by Topic Managers of ITDs
2. Threshold in terms of Topic VALUE instead of funding
3. A single APPLICANT may apply, no need for a consortium
4. One winner per topic

Calls for Proposals

						PUBLICATION			OUTCOME				
call #	ref	date publ	*Info Day*	closing date	evaluation week	VALUE	# topics	max funding	VALUE	# topics	Req. Funding	topic succes rate	ratio Rcq. Fund / VALUE
1	2009-01	15-Jun-09	*10-Jul-09*	31-Aug-10	14-Sep-09	27,0	72	20,3	21,9	59	13,7	81,9%	62,7%
2	2009-02	25-Nov-09	*15-Dec-09*	23-Feb-10	22-Mar-10	11,0	24	8,3	8,2	20	5,6	83,3%	68,2%
3	2010-01	29-Jan-10	*9-Feb-10*	27-Apr-10	17-May-10	17,0	45	12,8	14,4	39	9,3	86,7%	64,7%
4	2010-02	30-Mar-10		30-Jun-10	26-Jul-10	5,9	4	4,4	5,9	4	3,3	100,0%	55,9%
5	2010-03	30-Apr-10	*6-May-10*	20-Jul-10	13-Sep-10	26,0	34	19,5	10,8	27	7,5	79,4%	69,3%
6	2010-04	27-Jul-10	*10-Sep-10*	12-Oct-10	8-Nov-10	18,8	29	14,1	16,6	24	10,7	82,8%	64,3%
7	2010-05	24-Sep-10	*11-Oct-10*	9-Dec-10	17-Jan-11	30,6	38	23,0	23,5	29	14,6	76,3%	62,2%
					totals on 7 Calls	***136,3***	***246***	***102,2***	***101,3***	***202***	***64,7***		
					averages (on 7 Calls)	*19,5*	*35*	*14,6*	*14,5*	*29*	*9,2*	82,1%	63,3%
8	2011-01	10-Feb-11		3-May-11	23-May-11	42,5	58	31,9	36,1	49	22,5	84,5%	62,2%
9	2011-02	28-Apr-11		28-Jul-11	19-Sep-11	16,9	23	12,7					
10	2011-03	19-Jul-11		12-Oct-11	14-Nov-11	26,0	40	19,5					
11	2012-01	10-Jan-12		3-Apr-12	7-May-12								
12	2012-02	26-Apr-12		26-Jul-12	17-Sep-12								
13	2012-03	12-Jul-12		18-Oct-12	26-Nov-12								
14	2013-01												
15	2013-02												
16	2013-03												

Clean Sky CALL: SP1-JTI-CS-2011-03

Calendar of events:

- **Call Launch: 19 July 2011**
- **Call close: 12 October 2011, 17:00**

- Evaluations (indicative): 14-18 November 2011

- Start of negotiations (indicative): 19 December 2011
- Final date for signature of GA by Partner: 31 January 2012
- Final date for signature of GA by Clean Sky JU: 15 February 2012

Reference documents

Clean Sky Joint Undertaking
Call SP1-JTI-CS-2011-03

European Commission
Research Directorate

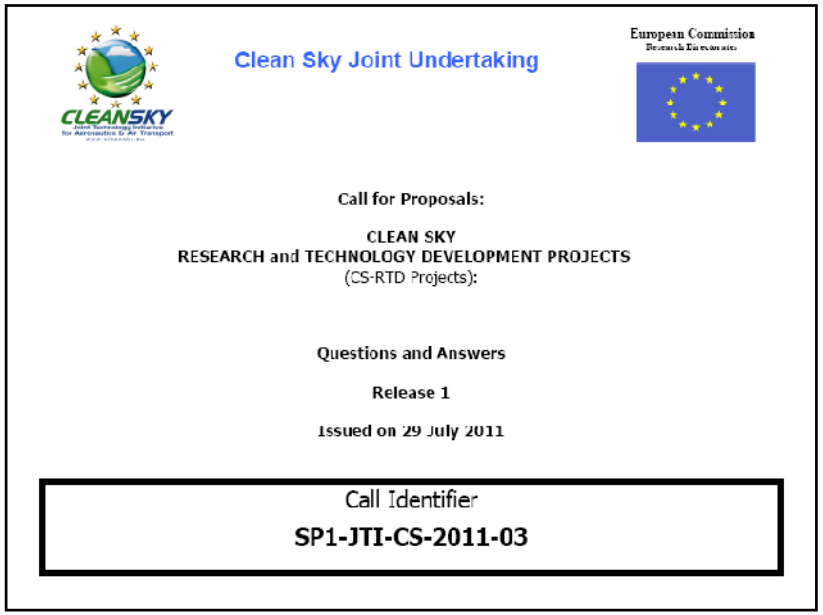
Call for Proposals:

CLEAN SKY
RESEARCH and TECHNOLOGY DEVELOPMENT PROJECTS
(CS-RTD Projects):

Call Text

Version 2: 29 July 2011
See page 2 for a summary of the changes

Call Identifier
SP1-JTI-CS-2011-03



Clean Sky Joint Undertaking

European Commission
Research Directorate

Call for Proposals:

CLEAN SKY
RESEARCH and TECHNOLOGY DEVELOPMENT PROJECTS
(CS-RTD Projects):

Questions and Answers

Release 1

Issued on 29 July 2011

Call Identifier
SP1-JTI-CS-2011-03

Contacts:

All questions regarding the topics published in this Call can be addressed to:

info-call-2011-03@cleansky.eu

Questions received until **1 September 2011** will be considered.

A first version of the Q/A document will be released by **9 September 2011**.

The final version of the Q/A document will be released by **21 September 2011**.

Call 10

Identification	ITD - AREA - TOPIC	topics	VALUE	MAX FUND
JTI-CS-ECO	**Clean Sky - EcoDesign**	**10**	**2.535.000**	**1.901.250**
JTI-CS-ECO-01	*Area-01 - EDA (Eco-Design for Airframe)*		**2.285.000**	
JTI-CS-2011-3-ECO-01-032	Formulation and characterisation of new aluminium alloys for high temperature applications (250°C)		450.000	
JTI-CS-2011-3-ECO-01-033	Corrosion protection of aluminium unpainted parts: development of an appropriated Cr free sealing		240.000	
JTI-CS-2011-3-ECO-01-034	Metal recycling from a/c sources: Recycling routes screening and metallurgical approaches		200.000	
JTI-CS-2011-3-ECO-01-035	Environmental friendly ancillary materials development: Bio-sourced material, Recycled sourced mat.		160.000	
JTI-CS-2011-3-ECO-01-036	Development of fungi growth inhibition coating for fuel tank		300.000	
JTI-CS-2011-3-ECO-01-037	Disintegration of Fiber Reinforced Composites by electrodynamic fragmentation technique		435.000	
JTI-CS-2011-3-ECO-01-038	Aircraft insulation recycling routes and experiments		200.000	
JTI-CS-2011-3-ECO-01-039	Development of a chromate 6+ free chemical surface treatment for cast magnesium alloys protection		200.000	
JTI-CS-2011-3-ECO-01-040	Devel. of a fully automated preforming process for 3-D shaped composite dry fiber		300.000	
JTI-CS-ECO-02	*Area-02 - EDS (Eco-Design for Systems)*		**250.000**	
JTI-CS-2011-3-ECO-02-012	Intelligent Load Power Management Rig Module		250.000	

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JTI-CS-2011-3-ECO-02-012	Intelligent Load Power Management Rig Module			
JTI-CS-GRA	**Clean Sky - Green Regional Aircraft**	**8**	**3.400.000**	**2.550.000**
JTI-CS-GRA-01	*Area-01 - Low weight configurations*		**750.000**	
JTI-CS-2011-3-GRA-01-039	Hybrid laminates Industrialization for a/c nose fuselage/cockpit		300.000	
JTI-CS-2011-3-GRA-01-040	Nose Fuselage/Cockpit dynamic characterization for internal noise attenuation		200.000	
JTI-CS-2011-3-GRA-01-041	Optimal tooling system for design for large composite parts		250.000	
JTI-CS-GRA-02	*Area-02 - Low noise configurations*		**2.150.000**	
JTI-CS-2011-3-GRA-02-017	Advanced low noise Main and Nose Landing Gears for Regional Aircraft -Trade off concept studies		2.000.000	
JTI-CS-2011-3-GRA-02-018	Low Noise Devices aeroacoustics numerical Simulation		150.000	
JTI-CS-GRA-03	*Area-03 - All electric aircraft*		**500.000**	
JTI-CS-2011-3-GRA-03-006	Development and manufacturing of Programmable Electrical Loads and advanced Power Supply		100.000	
JTI-CS-2011-3-GRA-03-007	Improvement of numerical models for JTI/GRA Shared Simulation Environment		150.000	
JTI-CS-2011-3-GRA-03-008	Control Console and Electrical Power Center for In-Flight Demo		250.000	
JTI-CS-GRA-04	*Area-04 - Mission and trajectory Management*			
JTI-CS-GRA-05	*Area-05 - New configurations*			

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JTI-CS-GRA-05	Area-05 - New configurations			
JTI-CS-GRC	**Clean Sky - Green Rotorcraft**	**3**	**1.322.000**	**991.500**
JTI-CS-GRC-01	*Area-01 - Innovative Rotor Blades*			
JTI-CS-GRC-02	*Area-02 - Reduced Drag of rotorcraft*			
JTI-CS-GRC-03	*Area-03 - Integration of innovative electrical systems*		**1.122.000**	
JTI-CS-2011-3-GRC-03-010	Advanced programmable Loads for Electrical Test Bench		210.000	
JTI-CS-2011-3-GRC-03-011	Multi-source regenerative systems power conversion		912.000	
JTI-CS-GRC-04	*Area-04 - Installation of diesel engines on light helicopters*			
JTI-CS-GRC-05	*Area-05 - Environmentally friendly flight paths*			
JTI-CS-GRC-06	*Area-06 - Eco Design for Rotorcraft*		**200.000**	
JTI-CS-2011-3-GRC-06-004	Dismantling and recycling of ecodesigned helicopter demonstrators		200.000	
JTI-CS-SAGE	**Clean Sky - Sustainable and Green Engines**	**4**	**7.400.000**	**5.550.000**

Call 10

JTI-CS-SAGE	**Clean Sky - Sustainable and Green Engines**	**4**	**7.400.000**	**5.550.000**
JTI-CS-SAGE-01	*Area-01 - Geared Open Rotor*			
JTI-CS-SAGE-02	*Area-02 - Direct Drive Open Rotor*		**6.200.000**	
JTI-CS-2011-3-SAGE-02-009	CROR Propeller blades		4.000.000	
JTI-CS-2011-3-SAGE-02-010	Contra-Rotating Open Rotor (CROR) Propeller barrels		2.200.000	
JTI-CS-SAGE-03	*Area-03 - Large 3-shaft turbofan*			
JTI-CS-SAGE-04	*Area-04 - Geared Turbofan*		**1.200.000**	
JTI-CS-2011-3-SAGE-04-017	Integration of an Acoustic Absorber into the Turbine Exit Casing (TEC)		500.000	
JTI-CS-2011-3-SAGE-04-018	Development of a Microwave Clearance Measurement System for Low Pressure Turbines		700.000	
JTI-CS-SAGE-05	*Area-05 - Turboshaft*		**0**	

Call 10

JTI-CS-SFWA	**Clean Sky - Smart Fixed Wing Aircraft**	**5**	**5.650.000**	**4.237.500**
JTI-CS-SFWA-01	*Area01 – Smart Wing Technology*			
JTI-CS-SFWA-02	*Area02 - New Configuration*		**5.650.000**	
JTI-CS-2011-3-SFWA-02-019	Investigation of Bird Strike criteria for Natural Laminar Flow wings		800.000	
JTI-CS-2011-3-SFWA-02-020	Development of an automated gap filler device		550.000	
JTI-CS-2011-3-SFWA-02-021	Fixed Leading Edge Structure and Systems Demonstrator for a Business Jet laminar wing		1.500.000	
JTI-CS-2011-3-SFWA-02-022	Design and manufacturing of an innovative cryogenic wind tunnel model with motorized empennage		1.300.000	
JTI-CS-2011-3-SFWA-02-023	Development, manufacturing and testing of two different High Load Small Space Rotary Gear Types		1.500.000	
JTI-CS-SFWA-03	*Area03 – Flight Demonstrators*		**0**	

Call 10

JTI-CS-SGO	**Clean Sky - Systems for Green Operations**	**10**	**5.690.000**	**4.267.500**
JTI-CS-SGO-01	*Area-01 - Definition of Aircraft Solutions and explotation strategies*			
JTI-CS-SGO-02	*Area-02 - Management of Aircraft Energy*		**2.400.000**	
JTI-CS-2011-3-SGO-02-014	Construction of bespoke evaluation Power Modules		250.000	
JTI-CS-2011-3-SGO-02-021	Development of key technology components for high-power density power converters for rotorcraft		250.000	
JTI-CS-2011-3-SGO-02-033	Optimisation of coating for the opeartion of power electronis with "open box" -housing in high altitude and		500.000	
JTI-CS-2011-3-SGO-02-035	Disconect device for jam tolerant linear actuators		600.000	
JTI-CS-2011-3-SGO-02-036	Design and optimisation of locally reacting acoustic material		300.000	
JTI-CS-2011-3-SGO-02-037	Feasibility study of full SiC High Integrated Power Electronic Module (HIPEM) for Aeronautic Application		500.000	
JTI-CS-SGO-03	*Area-03 - Management of Trajectory and Mission*		**2.540.000**	
JTI-CS-2011-3-SGO-03-014	Smart Operations on Ground power electronic with energy recycling system		1.390.000	
JTI-CS-2011-3-SGO-03-015	Simplified noise models for real time on-board applications		400.000	
JTI-CS-2011-3-SGO-03-016	Development of an Electronic Fligth Bag platform with integrated A-WXR and Q-AI Agents SW		750.000	
JTI-CS-SGO-04	*Area-04 - Aircraft Demonstrators*		**750.000**	
JTI-CS-2011-3-SGO-04-004	Design and manufacturing of a flight worthy intake system (scoop/NACA divergent intake)		750.000	
JTI-CS-SGO-05	*Area-05 - Aircraft-level assessment and exploitation*			

Final remarks

Clean Sky is

- The focus of the European environmental research in aeronautics
- One of the largest research program in aeronautics in the world, putting Europe at the forefront of the greening effort in aviation

Clean Sky

- Covers a set of game changing technologies and systems
- Contributes to reaching the ACARE goals
- Involves most significant players in Europe and a large number of SMEs, including the eastern Countries
- Paves the way for the future PPPs in FP8