

EU OPPORTUNITIES FOR RESEARCH AND INNOVATION IN AERONAUTICS (OVERVIEW)

HORIZON 2020 **CleanSky2**

Igor Rybalchenko, NCP “Smart, Green and Integrated Transport”



HORIZON 2020

The European Union's
programme for Research
and Innovation

Open to the world!

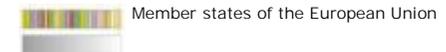
HORIZON 2020

The European Union

500 million people - 28 countries - a single market*



- 7% of the World's population
- 24% of world expenditure on research
- 32% of high-impact publications
- 32% of patent applications



Member states of the European Union

*Free movement of people, goods, services and capital

WHAT IS HORIZON 2020?

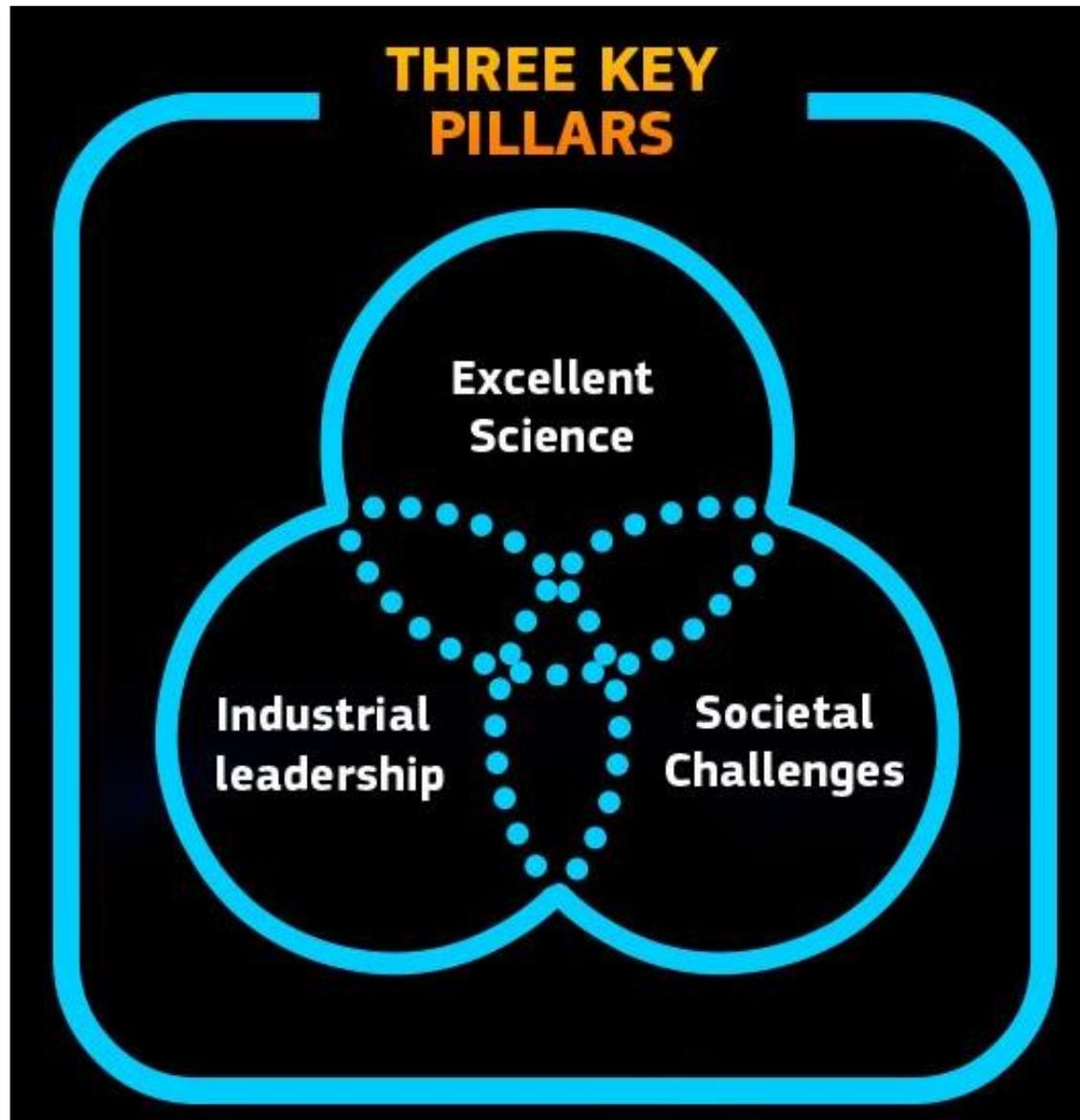
- A €80 billion research and innovation funding program (2014 -2020)
- A response to economic crisis by investing in future jobs and growth
- It addresses people's concerns about their livelihoods, safety and environment



Horizon 2020

A single programme

- Coupling research with innovation: 'from lab to market'
- Focus on societal challenges: health, clean energy, transport, etc.
- Open to participation: companies, universities, institutes in EU and beyond





Excellent science

- European Research Council

Supporting top researchers from anywhere in the world to work in Europe

- Future and Emerging Technologies

Supporting visionary thinking through collaborations between science and engineering

- Marie Skłodowska-Curie actions

Providing opportunities for training and career development of individual researchers

- Research infrastructures- including e-infrastructure

Ensuring access to world-class facilities



Industrial leadership

- Leadership in enabling and industrial technologies
- Emphasising key technologies in areas such as advanced manufacturing, microelectronics, nanotechnology, biotechnology, ICT and space

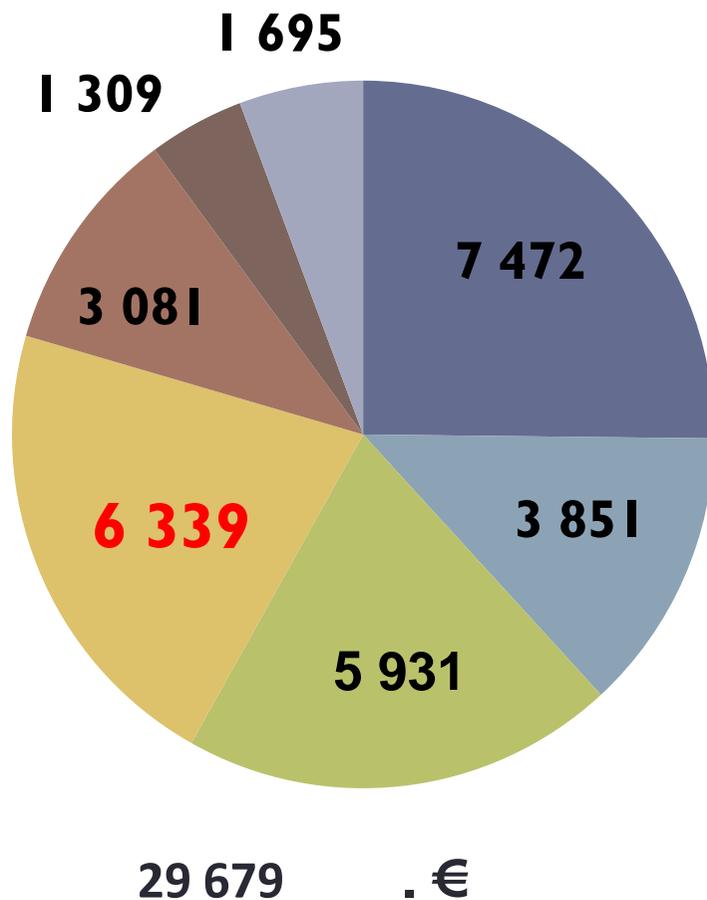




Societal challenges

- Health, demographic change and wellbeing
- Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy
- Secure, clean and efficient energy
- **Smart, green and integrated transport**
- Climate action, environment, resource efficiency and raw materials
- Inclusive, innovative and reflective societies
- Secure societies

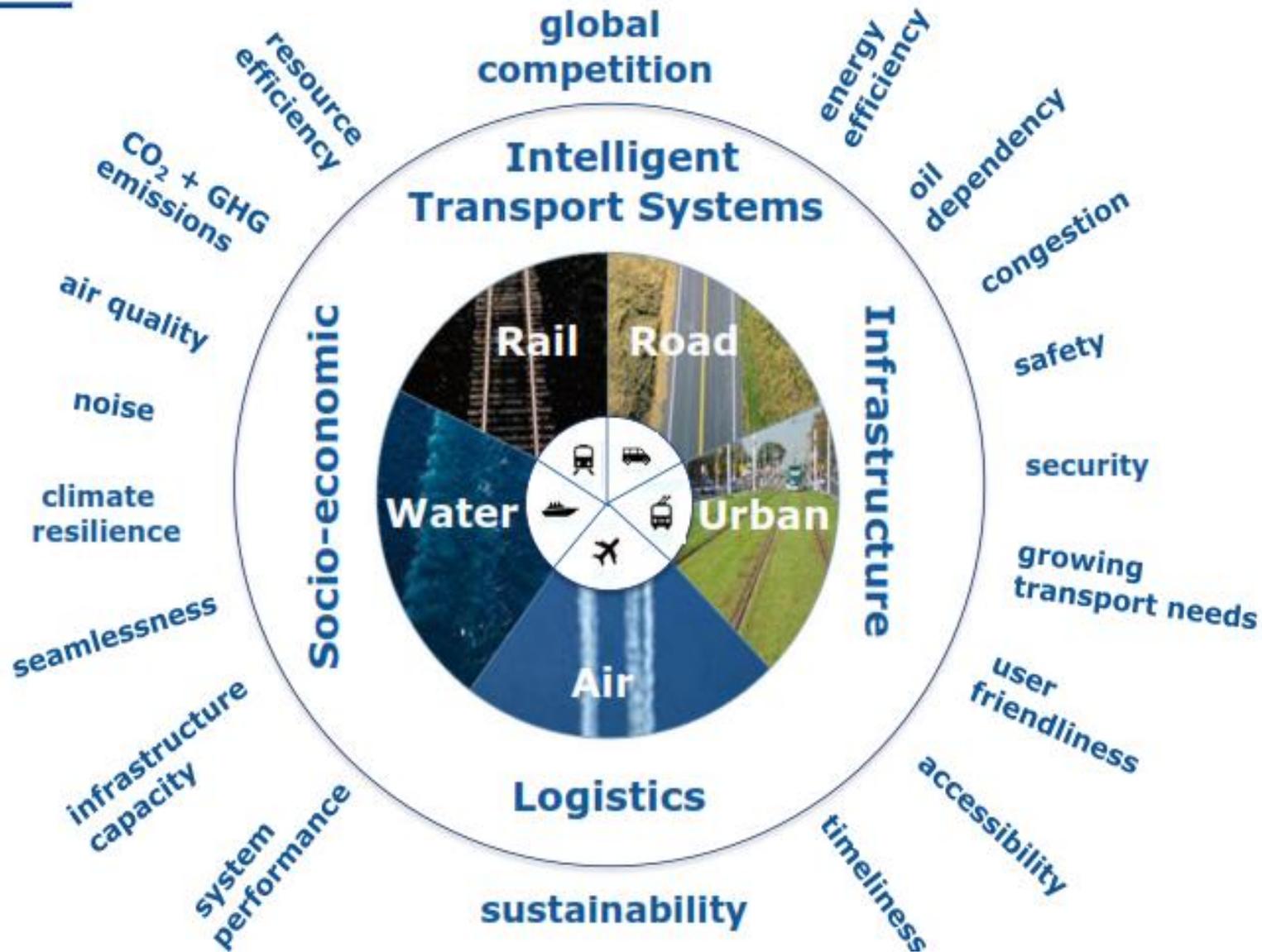
Societal challenges (budget):



- Здоровье, демографические изменения и благосостояние
- Пищевая безопасность, стабильное сельское хозяйство, морские исследования и биоэкономика
- Безопасная, чистая и эффективная энергетика
- **Умный, экологический и интегрированный транспорт**
- Климат, эффективное использования ресурсов и сырья
- Одаренное и инновационное общество

Transport:

Commission



AVIATION

CALL: MG - MOBILITY FOR GROWTH

Topics and proposals in Aviation (02/2017):

MG-1-2-2017: Reducing aviation noise - 4

MG-1-4-2016-2017: Breakthrough innovation - 31

MG-1-5-2016-2017: Identification of gaps, barriers and needs in the aviation research - 0

MG-1.1-2016: Reducing energy consumption and environmental impact of aviation - 11

MG-1.3-2017: Maintaining industrial leadership in aeronautics - 72

Other H2020 opportunities:



- Excellent Science**
- European Research Council
 - Future and Emerging Technologies
 - Marie Skłodowska-Curie Actions
 - Infrastructures



Industrial Leadership

- Leadership in Enabling and Industrial Technologies (LEIT)

- i. Information Communication Techno
- ii. Nanotechnologies, Advanced materials, Biotechnology and Advanced manufacturing and processing (incl. FoF)
- iii. Space
- Access to risk finance
- Innovation in SMEs



Societal Challenges

- Health, demographic change and well-being
- Food security, sustainable ...
- Secure, clean and efficient energy
- Smart, green and integrated Transport (8.25%)
- Climate action, environment, resource efficiency and raw materials
- Secure societies



- Spreading excellence and widening participation
- Science with and for society
- Communication & dissemination

EIT
JRC

Total 70,2 bEur

2011 prices

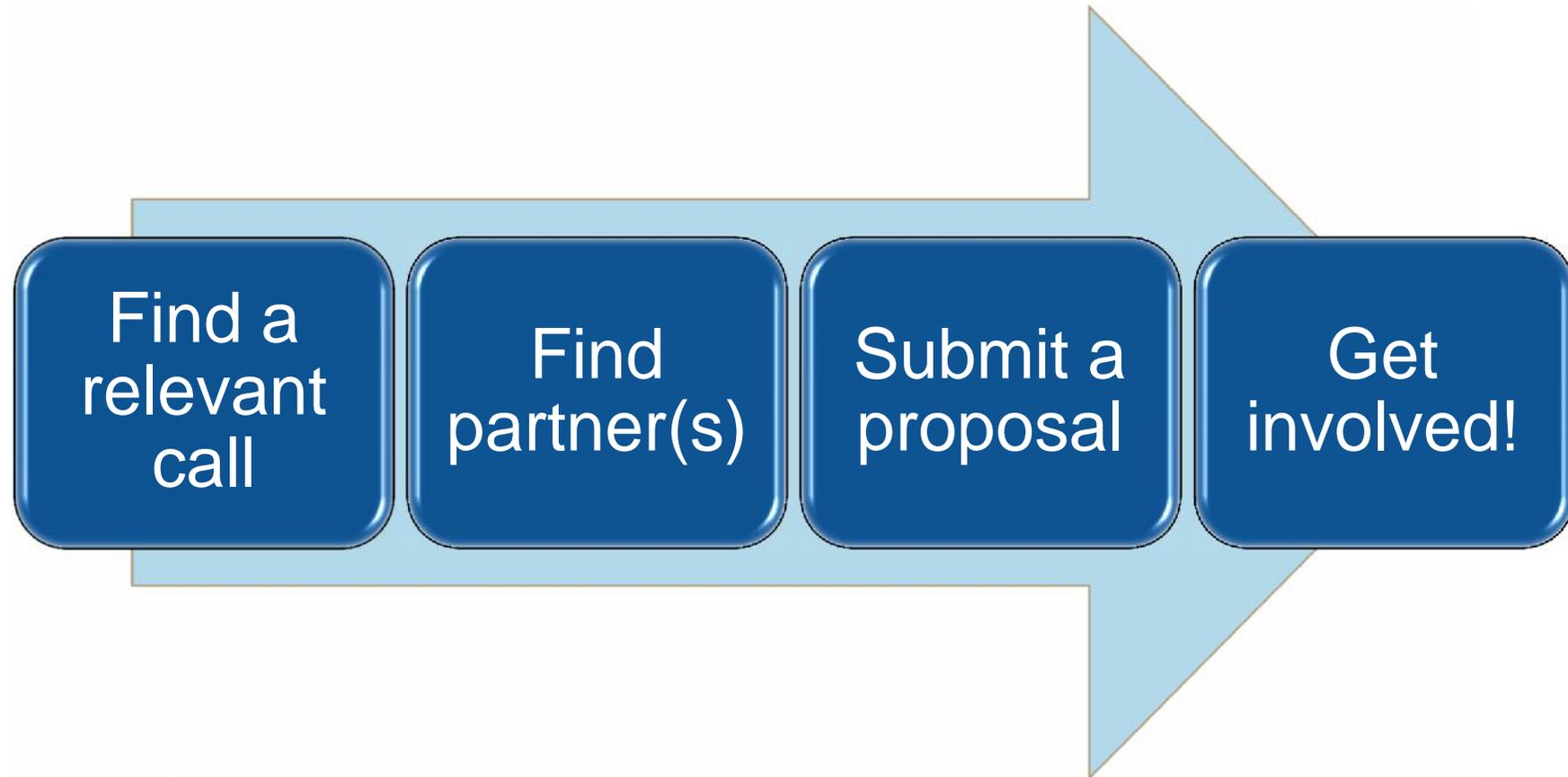


Who can participate in 2020?

- ▶ Science – Universities, Research Institutions, Labs etc.
- ▶ Business – large, medium, small
- ▶ **BUT!**
- ▶ **Excellent science**
- ▶ **Innovative business**
- ▶ **Of European dimension**
- ▶ **According to 2020 priorities**



How does it work?



Where to find more information and where to apply?

- **Horizon 2020 Participant Portal**

Research and Innovation
European Commission

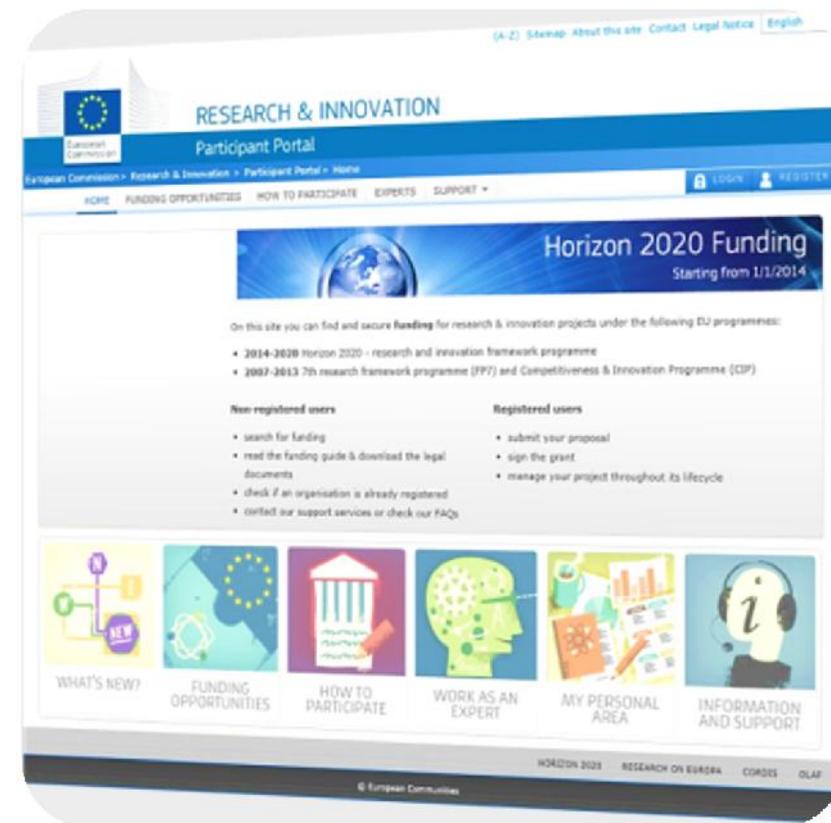
<http://ec.europa.eu/research/participants/portal/desktop/en/home.html>

- **Horizon 2020 European Commission**

<http://ec.europa.eu/programmes/horizon2020/>

- **ETNA2020** (Transport NCP's network)

<http://www.transport-ncps.net/>





Clean Sky 2

<http://www.cleansky.eu>

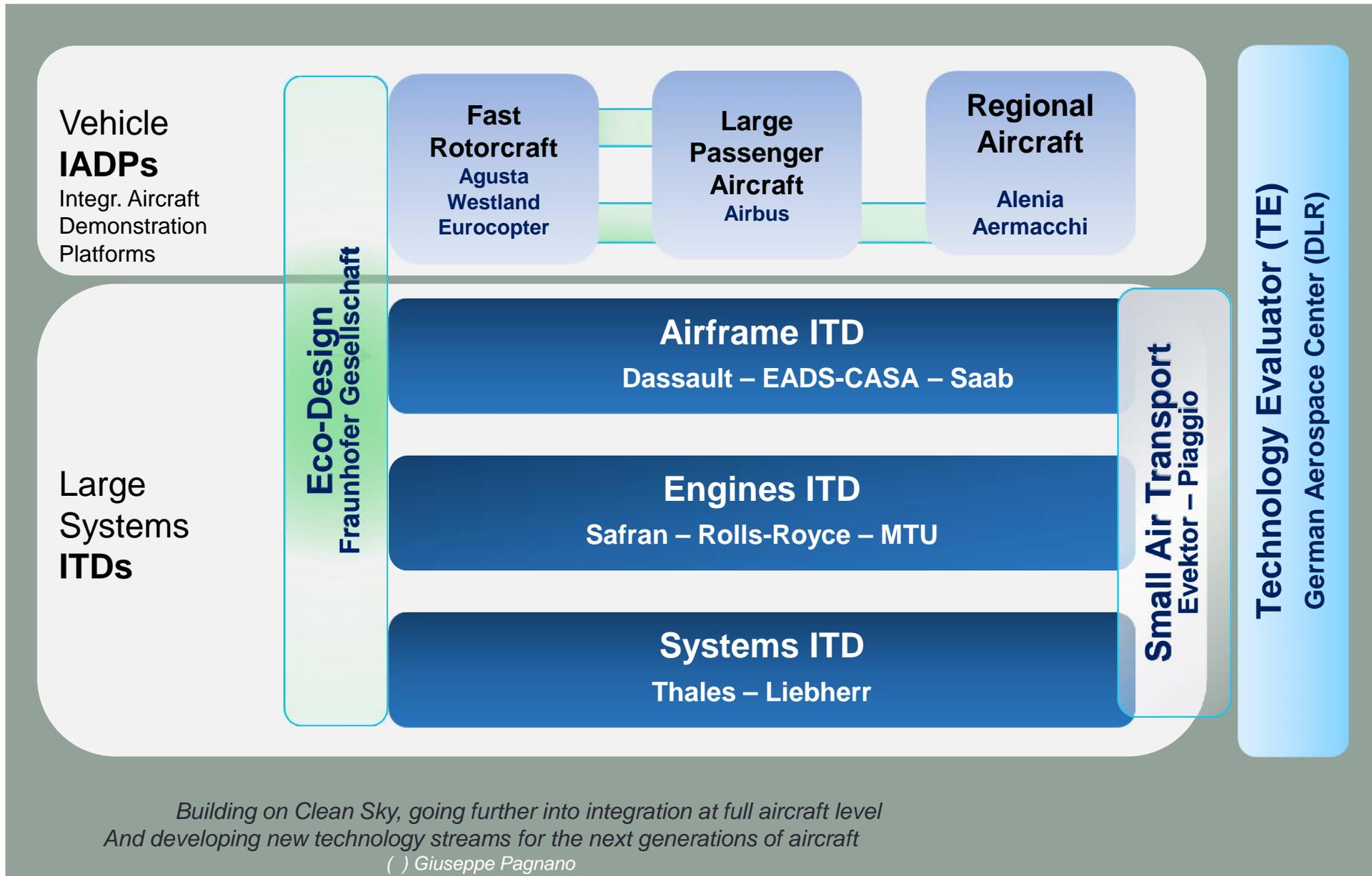
What is leanSky2?

- Largest European research&innovation programme in aviation (€4 billion, 24 countries, 600 partners)
- Joint Technology Initiative (JTI) – EU and leading aviation industry
- Public-Private Partnership (PPP) – EU funding + Industry funding
- Continuation of CleanSky1 (FP7)
- Integral part of 2020

CS2 Goals

- New generation of aircrafts – development and demonstration
- Emissions cut - CO₂ at 50%, NO_x at 80%, noise at 50%
- Integration of various innovations at aircraft/system level
- EU sustainable development in such high-tech field of industry
- Global competition winner





CS2 structure

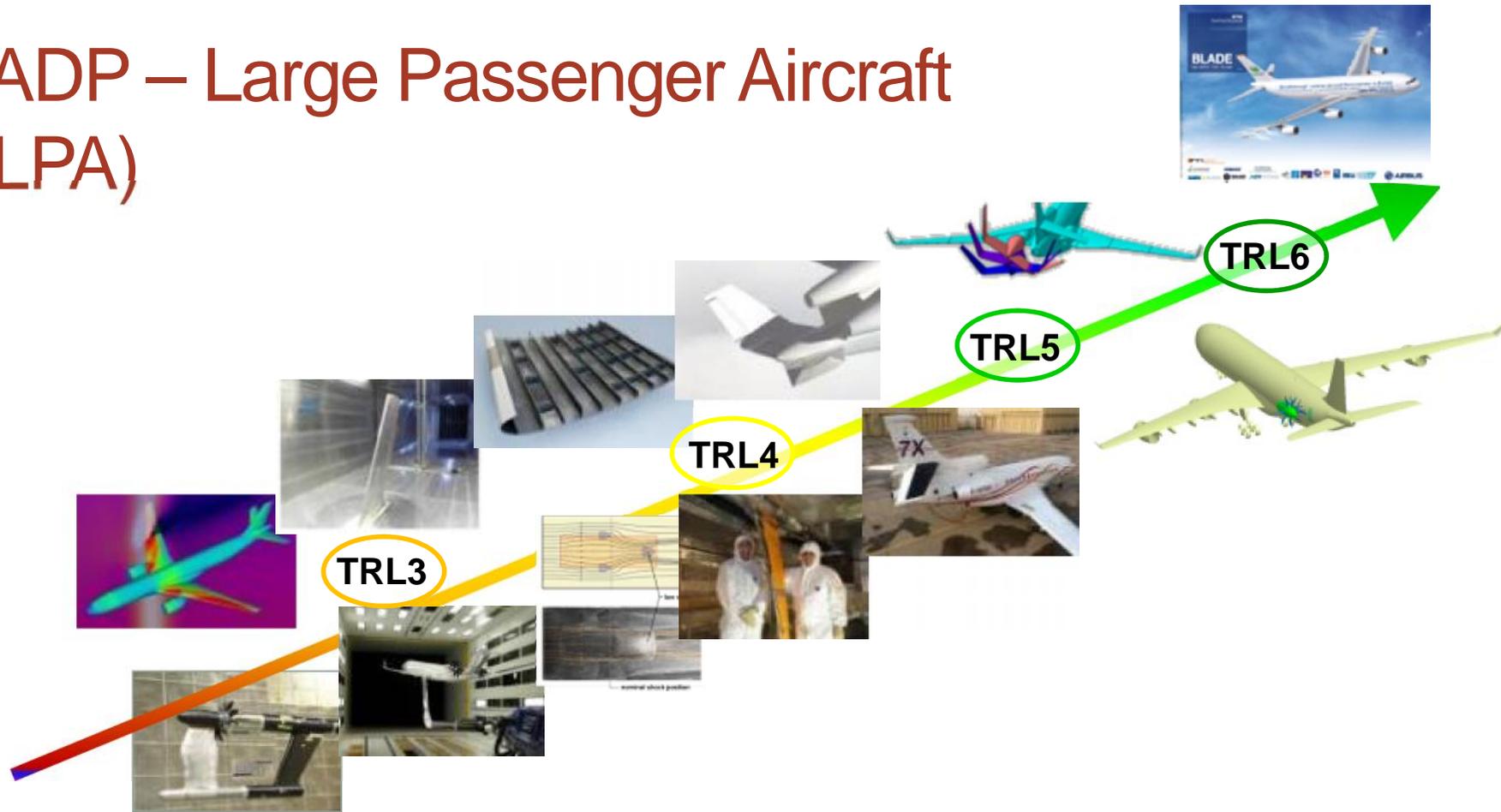
- Top level – funding members, leaders
- Second level - core partners).
- “Admission tickets” to be purchased
- Third level – **partners**. Free of charge.
- Total funding 1,7 bil €
- 40% of funds – to leaders
- 30% - to core partners
- 30% - to partners



Clean Sky 2



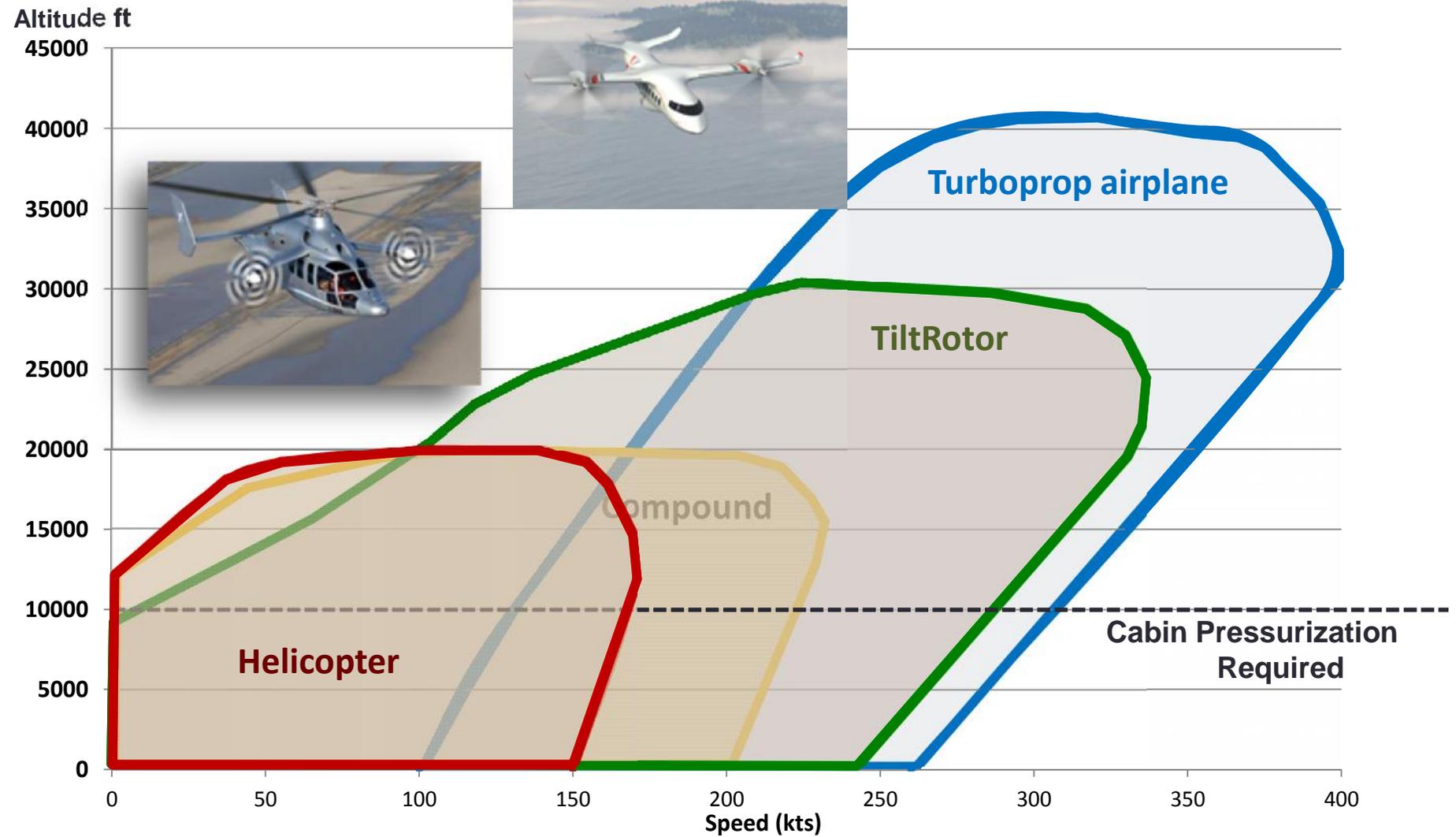
IADP – Large Passenger Aircraft (LPA)



Contribute to TRL - Scale

1	2	3	4	5	6
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IADP –Fast Rotorcraft



Sustainable and Green Engines (SAGE)

2008 - 2016

Rolls-Royce



SAGE 1
Geared Open Rotor

SAFRAN
Snecma

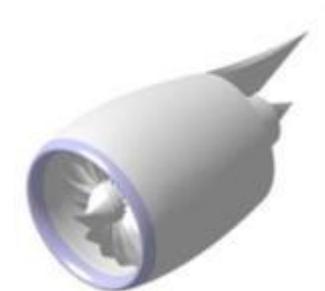


SAGE 2
Geared Open Rotor

Rolls-Royce

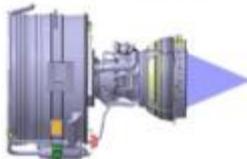


SAGE 3
Large 3-Shaft Turbofan



UHBR turbofan for SMR aircraft

Rolls-Royce



SAGE 6
Lean Burn

SAFRAN
Turbomeca



SAGE 5
Turboshaft

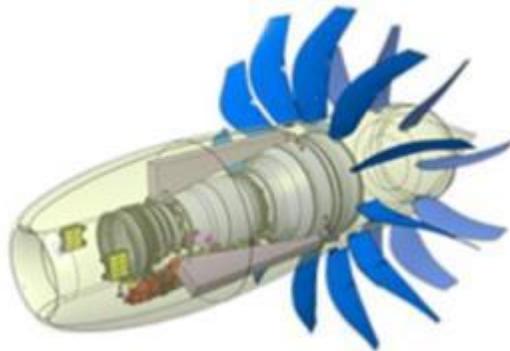
MTU
 Aero Engines



SAGE 4
Geared Turbofan



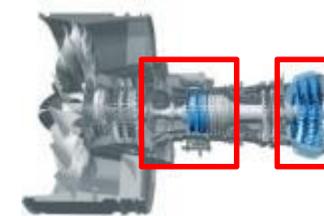
VHBR technologies for the long range airliner



Open Rotor engine



ARDIDEN 3
Existing turboshaft
to be modified for CS2 TP



6th Call for Partners (CfP06):

Area	No. of topics	Funding (M€)
IADP Large Passenger Aircraft	17	15,48
IADP Regional Aircraft	2	2,0
IADP Fast Rotorcraft	11	11,05
ITD Airframe	17	14,15
ITD Engines	14	15,77
ITD Systems	13	10,35
<i>Small Air Transport (SAT) Transverse Area</i>	2	1,6
<i>ECO Transverse Area</i>	0	0
<i>Technology Evaluator</i>	0	0
TOTAL	74	68.80

**OPEN
NOW!**

Detailed topics description at:

<http://ec.europa.eu/research/participants/portal/desktop/en/home.html>

CS2 “sensitive issues”:

- Industry-oriented topics mostly (outsourcing)
- IA (Innovation Actions) vs. RIA (Research and Innovation Actions)
- High TRL (4-6) vs. low TRL (1-3)
- H2020 Aviation Collaborative Projects funding cut 80% in favor of CS2
- EREA and PEGASUS Position Paper:
- ***ensure the continuance of bottom-up low-TRL research in the future***
- **appropriate funding for basic low-TRL research in aviation**



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