Parallel Session IIA
Global leadership and competitiveness
Horizon 2020
Work Programme for Research & Innovation 2018-2020

H2020 Transport info day – 07 October 2019

Innovative electric network architectures and systems, optimising global energy, electrical power, data and communication for aviation

Michail Kyriakopoulos
European Commission – DG RTD

#H2020Transport


MG-3-4-2020

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Challenge:
- Global energy aircraft optimisation
- More Electric Aircraft (MEA) architectures
- (both incremental as well as disruptive future aircraft configurations)

Scope:
- Next generation modular and distributed power data and wireless networks
- Advanced technologies for electrical heat dissipation
- Safe, secure, robust and reliable connectivity solutions
- Advancements in interface standardisation
- Research on artificial intelligence and data-driven technologies
Expected impact:

- European industrial leadership
- Advance further innovative electric network architectures and systems
- Improved aircraft energy management
- Weight reductions, simplicity and scalability
- Data connectivity, safety and security (incl. cybersecurity)
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Next generation multifunctional and intelligent airframe and engine parts

Michail Kyriakopoulos
European Commission – DG RTD

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Challenge:
• Multifunctional and intelligent
• Airframe and engine parts
• High-value manufacturing, MRO, circular economy

Scope:
• Flexible wing with morphing capabilities
• Innovative joining technologies and damage diagnostics
• Advanced quality monitoring and on-line process control
• Manufacturing processes for the production of composite, multifunctional and intelligent airframe parts
• Multifunctional and intelligent engine parts
• Health management and monitoring
• New MRO and recycling technologies
Expected impact:

• European industrial leadership
• Manufacturing next generation multifunctional and intelligent airframe and engine parts
• New manufacturing paradigm shift with enhanced ecological maintenance and recycling characteristics
• New/updated technologies that will offer a competitive advantage of European MROs
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Towards Sustainable
Urban Air Mobility

Type: Research and Innovation action

Pablo Pérez - Illana
European Commission – DG RTD

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Towards Sustainable
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Type: Research and Innovation action

Pablo Pérez - Illana
European Commission – DG RTD

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Towards Sustainable Urban Air Mobility - Challenge

- Disruptive innovation
  - for aviation, mobility and urban planning
- Levels:
  - urban / sub-urban / peri-urban / inter-urban
- Context:
  - surface transport: lack, congestion, infrastructure
  - time: to save
  - logistic chains: lighten, complement
- Companies, cities, regions:
  - Manned / Unmanned aircraft systems’ business
  - Services for emergencies, people and freight mobility.
- Safe, secure, quiet and green.
- More accessible, faster, affordable, inclusive & publicly accepted.
- Research: aeronautical & cross-disciplinary --> aerial traffic in urban environments
  - More autonomous systems
  - Climate Change Long Term Strategy
  - System-of-systems approach: integration with urban infrastructure and networks (energy, communication, transport).
Concepts, technologies and solutions beyond the state of-the-art.

Proposals should address all the following three research areas:

- **A. Safety & security**: operation centric, risk-based (e.g. populated areas!)
  - **Hazards** e.g. weather, airflow at low altitudes; human factors and automation; collision (avoidance); electro-magnetic (compatibility);
  - **Threats** (physical & cyber) (e.g. interference, misuse): detection, surveillance, prevention, preparedness, response, recovery

- **B. Sustainability** / environmental footprint e.g.
  - Energy, Emissions (local & global/GHG),
  - Noise, Visual pollution + perception, monitoring and mitigation.

- **C. Public acceptance, socio-economic, regulatory & organisation**
  - Noise, visual pollution, privacy, shared-use, land-use, liability, safety (incl. airworthiness), security (incl. enforcement), certification.
  - **Co-creation** & involvement of citizens is key e.g. to anticipate:
    - behavior, - blocking points, - needs, - public tolerance/embracement.
  - **Policy recommendations** should also include strategies for:
    - procurement , - deployment
In addition, address one or more of the following research areas:

- **D. Services**: new door-to-door or emergency services concepts
  - embedded in multi-modal transportation;
  - new approaches for regulatory due processes for services.

- **E. Operations**: new UAM concepts of operations
  - traffic in multi-modal transportation/emergency (ground/air ambulances),
  - safe and secure utilisation of the air space.

- **F. Power-plant/propulsion** system development
  - safe, economic and environmentally friendly (emissions incl. noise)
  - high power/weight ratio, fast battery recharge/fuel-cell refill
  - reliability, fail-safety and maintenance.

- **G. Infrastructure** adaptation, evolution and integration
  - into transport, energy and ICT networks
  - for efficient and seamless door-to-door.

Emphasis on early urban air mobility services e.g.
- air medical emergencies
- safety & security services,
- logistics, etc
Towards Sustainable Urban Air Mobility – Scope

**TRL up to 6** - depending on resources.

**Commitments**: research and industrial, **local authorities & communities**
other relevant leading-edge industrial and service sectors

**Complementarities**: with the European U-space Demonstrator Network and SESAR JU.

**Synergies** possible with **EU initiatives**:
- EIP-SCC/UAM.
- CIVITAS
- European Institute of Technology / KIC on Urban Mobility.
- EU communication/connectivity initiatives (e.g. 5G, C-ITS).
- EU sat-based navigation (EGNOS/Galileo), observation (Copernicus)

**International** cooperation in cases of mutual benefit,
such as sharing with early adopters of urban air mobility
in megacities (e.g. Singapore, Dubai, Sao Paulo, Mexico DF, etc.)

Contribution per proposal (indicative only): EUR **4 – 6** million
Total EU funding: EUR **15** million
By all proposals, contribute to:

- **Smarter** and more sustainable cities & air transport.
- Maintain aviation safety levels.
- European / international standards and legislation.
- Handle the regulatory due processes for UAM services by authorities: air regulators, urban planners, ...
- Decrease the overall environmental footprint.

When relevant, contribute to:

- Decrease the time (door-to-door travel or emergency interventions).
- Reduce the lead time-to-market & De-risk the set-up of UAM services.
- New urban planning tools to integrate UAM services (Sustainable Urban Mobility Plans, transport/logistics plans, ...).
- Competitiveness and economic growth (vs congestion).
- Inspire and engage new generations of students, engineers, urban planners and mobility managers.
Opening: 03 Dec 2019  Closing: 21 Apr 2020

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Improved production and maintenance processes in shipyards

Peter Crawley
European Commission – DG RTD

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Challenge:

• European ship building, repair, modification and maintenance is often founded on technology based competitive advantage. But competitors are becoming more advanced.

• Ship types that were developed in Europe are now built elsewhere. European marine equipment is often fitted to ships in non-European shipyards.

• Still Europe leads in very high tech ships such as cruise vessels, but it’s a niche and competitors are also trying to enter the high tech shipping market.

• Particularly a challenge for smaller shipyards which develop and maintain niche products or who are integrated in smart supply chains yet lack R&I resources.

• Continuous innovation is needed to remain competitive and lessons may be drawn for other sectors including automotive, aerospace and IT.
Address all of the following:

- Innovative technologies/systems to enhance competitiveness of production and maintenance processes in European shipbuilders and ship yards.
- Identify skills development needs and strategies to maximize value from innovative production technologies and practices.
- Testing and demonstration to at least TRL 5. Benchmark against existing practices, consider environmental impacts and quantify additional value.
- Develop business plans and roll out strategies.
- IPR and or other measures to reduce innovation leakage outside of Europe.

Not excluding very large shipyards, an emphasis on the competitive needs of smaller and medium size shipyards across Europe would be welcome in those cases where incremental benefits from R&I maybe higher.

IA: Suggested contribution EUR 4-6 million

Total topic budget EUR 15 million
Impact:

• Emphasis on smaller and mediums sized European shipyards and ship builders, to increase competiveness and growth of the European sector, particularly within international markets.

• Reinforce and grow European employment and the necessary skills development for the successful uptake of innovative production processes and technologies.

• Improve environmental performance of shipyards and ship builders.

• Support a multiplication effect within Europe beyond the immediate participants.

• Maximise EU added value by minimising knowledge and technology leakage.
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First of the Kind solutions for sustainable transport and mobility

Guido Sacchetto
European Commission – DG RTD

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Challenge:

• Need to remove obstacles that slow down the market uptake of innovative zero (and near to zero) emission technologies and services

• “First of a kind” solutions have a need for visibility, industrial viability and users’ acceptance

• Access to financing opportunities is another bottleneck

• Lowering the risk in acquisition of innovative products and services is a crucial condition for their wider market uptake.

• Support the definition of additional/complementary services that can help overcome the technicalities connected to the embedding innovations.

Future sustainability of the proposed facility is expected.

EU contribution EUR 1-1,5 million.
MG-3-8-2020: First of the Kind’ solutions for sustainable transport and mobility: EU initiative for accelerating EU-wide market access, scale up and derisking

Scope:

Develop an EU matchmaking system (tools and services) to de-risk large purchasing of solutions at EU level and accelerate market access

• purchase aggregation of innovative zero emission solutions (TRL7>) mobilising main actors, multipliers and platforms; users of the facility (long lasting activity, beyond the project’s life) shall be involved

• develop activities and offer services for matching supply and demand (off-line and/or on-line tools and instruments), offer a wide and updated portfolio of solutions; demand-side shall regroup potential buyers to support critical mass, regroup and list replacement plans and buyers schedules, allow awareness of opportunities, peer review plans and support aggregations, also interrelating asset management with risk management.

• stimulate dissemination, exchange of knowledge and good practices on EU and national procurement processes as well as on regulatory issues, also offering specific services supporting access to innovation finance
MG-3-8-2020: First of the Kind’ solutions for sustainable transport and mobility: EU initiative for accelerating EU-wide market access, scale up and derisking

Impact:

• Accelerate EU-wide market access and scale up of innovative zero (and near to zero) emission transport and mobility technologies, products and services for both potential buyers and users.

• Achievement of critical mass for innovative solutions through market aggregation of multiple buyers, matchmaking activities and other support services on both supply and demand side.

• Market scaling up of innovative zero emission solutions.

• Help mobilise financial resources to scale up innovative solutions in the shortest time possible.
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