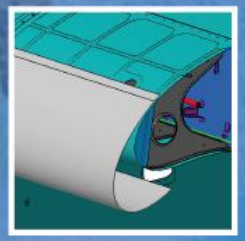












Innovation Takes Off

www.cleansky.eu

Clean Sky 2

Thematic Topics

“Where the Top-Down the Bottom-Up” …

Toulouse, May 2018

Innovation Takes Off

www.cleansky.eu

Clean Sky 2

Thematic Topics - Background

- **Thematic topics as new instrument to bring in new ideas contributing to CS2 HLO/complementing CS2 programme**
- **Features of thematic topics:**
  - Problem-oriented statements allowing research / technology routes to be selected and proposed by applicants
  - Allow for **retention of multiple projects against a topic**, where justified
  - Down-selecting on basis of clear contribution to CS2 HLO
  - Avoid duplication with H2020 calls in terms of both topic scope [narrower] and descriptions [more focused yet broader than CfP topics to date]

CfP08 Overview – Thematic Topics

List of Topics for Calls for Proposals (CFP08) – Part B

Identification Code	Title	Type of Action	Value (Funding in M€)
JTI-CS2-2018-CFP08-THT-01	Innovative NOx Reduction Technologies	RIA	1.00
JTI-CS2-2018-CFP08-THT-02	Cognitive Computing potential for cockpit operations	RIA	0.80

JTI-CS2-2018-CfP08-THT-01
Innovative NOx Reduction Technologies

- Based on novel proposals received from Academia about
  - Electro-chemical blocking of NOx emissions
  - Electro-magnetic decomposition of NOx Molecules
  - Plasma-assisted combustion
- CS2 Regulation -> NOx -30% vs 2014 ref by 2024
- In CS1, only target not fully met despite SAGE 6 (RR lean burn) + many related CfPs
- NOx = trade-off with CO2 and NOx reduction is primarily depending on Engine Technology.
- Final Topic enlarged to
  - Mid-term (2035) and Long Term (2050) Technologies
  - Primary (combustion zone) and secondary (exhaust) technologies

Innovative NOx Reduction Technologies

- The scope of this topic is twofold in terms of timeframe: progress on mid-term technology developments for EIS 2035, and breakthrough technologies for long term developments for EIS 2050.
- The scope is also twofold in terms of technology concepts (although not restricted to): primary control technologies to reduce NOx in the primary combustion zone, or secondary technologies to reduce NOx already present in the combustion gas (outside of the combustion zone, in the exhaust).

- Concepts and technologies may address any aero-engine market segment, i.e. turbofans, turboprops, helicopter engines.

Innovative NOx Reduction Technologies

Some examples of alternative NO_x reduction technologies have been identified over the years, sometimes used in other sectors (industry, automotive, etc.), sometimes evaluated only at very low TRL so far, and/or suffering issues in providing either a competitive market solution, reliability or weight issues when applied to aeronautical applications. Some of these examples however may exhibit promising potential for low emission engines in the long term future if their main drawbacks can be overcome.

Lean Pre-mixed Pre-vapourized (LPP)

Flameless oxidation combustion (flue gas recirculation)

Jet-stabilized combustion

Catalytic combustion

Trapped Vortex Combustion

Stagnation Point Reverse Flow (SPRF) Combustor

Electrochemical blocking of NO_x molecules (modulated arc and/or microwave discharges)

Plasma assisted combustion (high-frequency discharges, Nanosecond Repetitively Pulsed (NRP) discharges)

Electromagnetic decomposition of NOx molecules

Selective Catalytic Reduction (SCR)

Selective Non-Catalytic Reduction (SNCR)

Water/Steam injection

Intercooled/Alternative engine cycles

Variable geometry engines and/or combustors

Pressure Gain Combustors

Expected outcomes/impact

Proposals may address one or more technology solutions/tools/concepts described in the previous section or new solutions responding to the need of low emission combustors, at engine level.

The expected outcome of a project should include:

A comprehensive literature review of the state-of-the-art in relation with the solution proposed.

Key technologies/tools/concepts helping progress in low emissions combustion technology may cover one or several of the previously described items but the proposal should clearly state the initial TRL of the study and clear objectives in terms of NO_x reduction target.

Identification of scientific and technical challenges preventing the successful deployment of such technologies.

JTI-CS2-2018-CfP08-THT-02
Cognitive Computing Potential for Cockpit Operations

- **Topic Problem Statement / Scope :**
  - Analyse SoA, also in other sectors (Automotive, Maritime, …)
  - The potential use of cognitive technologies 2035 is increasing
    - voice command, eye tracking, heart rate, …
    - enhanced vision, mixed vision, direct projection of information on the eye…
    - use of **artificial intelligence**, …
- Derive potential Roadmap for future research
- In CS2, some work is ongoing in LPA and SYS (Cockpit of the Future),
- Including 1 topic in CfP08, but with more short term focus, targeting next generation a/c

JTI-CS2-2018-CfP08-THT-02
Cognitive Computing Potential for Cockpit Operations

The action should address the following aspects:

Identification of essential parameters necessary to follow he state of the aircraft and planning capabilities with respect to the mission

Identification of pilot expectations in various context based on information available (identified before) and current pilot state

Analysis of channel of acquisition and transmission of the information (text, voice, vision, …) from/to the pilot

Nature and content of the information to be given to the pilot to make the right decision

Expected outcomes/impact

A comprehensive literature review of the state-of-the-art in the area of research.

Progress in improving man/machine interaction in the field of more autonomous flight transport

Robust collaborative decision making, to satisfy aeronautical safety objectives, with significant benefits in pilot workload and effectiveness

Identify a technology roadmap for a flight crew digital assistant function

Identify the pathway to a digital assistant function supporting flight crews or remotely operated air vehicles

Demonstrate the applicability of the benefits of the cognitive assistant improvements to the field of flight transportation

Identification of scientific and technical challenges preventing the successful deployment of such technologies

Specific emphasis should be given to assessing the predictability and certifiability of such approaches. This would require a specific approach, e.g. as it is currently under investigation in the automotive domain (deep driving, etc…)

Applicant's Proposal Submission System

Templates for submitting a valid proposal:

1. Part A *[Administrative Section (Coordinator ID, Legal LEAR etc.)]*
2. Part B.I *[Technical Section: 3 EVAL Criteria and technical and financial content linked to DoA]*

NOTE: 30-page limitation for thematic topics

3. Part B.II *[Admin Section: members of consortium (participants, operational capacity, etc.), (potential) ethics and security issues identified by the applicant]*
4. PART C *[ESIF Complementary Activities – OPTIONAL]* – ***NA for TT***
5. Part D *[Declaration on the Participation of any Affiliated Entities to Private Members of CS2JU in this Proposal and Declaration(s) of Interests]*

These templates (in pdf format) are available to applicants on the Participant Portal.

8th Call for Proposal at a glance

▪ Call Launch	12 April 2018
▪ Call Closure	12 July 2018
▪ Evaluation Phase	Mid-Sep 2018
▪ Q&A last publication*	15 June 2018
▪ Technical sessions & Grant preparation	~Q3 2018 – Q1 2019
▪ Indicative Start date of activities	~Q4 2018**/Q1 2019 [TBC]

**Questions received up until 1 June 2018, 17:00 (Brussels Time) will be answered after analysis and published in Q&A when appropriate. In total, three publications of Q/As are foreseen: 12/04/2018, 15/05/2018 and 15/06/2018 (estimated dates).*

***Indicative start date for Thematic Topics*

For questions: Info-Call-CFP-2018-01@cleansky.eu

Find out more:

- Clean Sky 2 via www.cleansky.eu
- Call and background information via the **EC Participant Portal**

Any questions?

Info-Call-CFP-2018-01@cleansky.eu

Last deadline to submit your questions:
1st June 2018, 17:00 (Brussels time)