

PROJECT

## VENUS

# inVestigation of distributEd propulsion Noise and its mitigation through wind tUnnel experiments and numerical Simulations

**Funding:** European (Horizon 2020)

**Duration:** Apr 2020 - Sep 2023

**Status:** Ongoing

**Total project cost:** €2,282,875

**EU contribution:** €2,282,875



**Call for proposal:** H2020-CS2-CFP10-2019-01

[CORDIS RCN : 228014](#)

### Objectives:

Distributed Electric Propulsion (DEP), is one of the propulsion configurations that, taking advantage from the Distributed Propulsion concept, is believed to exploit the benefits of electrical engines to drastically reduce fuel consumption and emissions.

In the framework of the topic JTI-CS2-2018-CFP10-THT-08, the proposal VENUS will have the objective to understand the physics behind the aeroacoustics of DEP through a deep theoretical, experimental and numerical study. Appropriate numerical procedures for DEP noise assessment will be set-up and experimental data-set obtained in dedicated wind tunnel tests, will be used both as experimental DEP noise validation reference and for providing support to the identification of the main parameters affecting DEP noise.

Technologies for DEP noise reduction will be studied as well and tested experimentally. From the technical standpoint, the VENUS consortium will support the model design, manufacturing and integration by realizing a representative test article for WT parametric aeroacoustic tests, able to allow for configuration changes, in terms of engine-wing and engine-engine installation configurations, and to test the selected noise mitigation technologies. The consortium will develop methods and tools enabling a concurrent aerodynamic and aeroacoustic design of DEP configuration aircraft. The final step will consist in the experimental-numerical assessment of the numerical models.

As a practical achievement, the study will support the design of a new regional aircraft configuration, in terms of wing and engines' installation, to target a DEP which is optimized in terms of aerodynamic and aeroacoustic performance. It is pointed out that all the produced models, data and documents will be open access for other institutions, with the objective to establish an "open test-case" for the whole European scientific community, unique in the aircraft design landscape.

### Parent Programmes:

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

**Institute type:** Public institution

**Institute name:** European Commission

**Funding type:** Public (EU)

### Lead Organisation:

**Universita Degli Studi Roma Tre**

**Address:**

Via Ostiense 159  
154 Roma  
Italy

**EU Contribution:** €750,500

## Partner Organisations:

### **Ibk-Innovation Gmbh & Co. Kg**

**Address:**

BUTENDEICHSWEG 2  
21129 HAMBURG  
Germany

**Organisation Website:**

<http://www.ibk-innovation.de>

**EU Contribution:** €356,250

### **C.i.r.a. Centro Italiano Ricerche Aerospaziali Scpa**

**Address:**

VIA MAIORISE  
81043 CAPUA  
Italy

**Organisation Website:**

<http://www.cira.it>

**EU Contribution:** €378,500

### **Eligio Re Fraschini Spa**

**Address:**

VIA XX SETTEMBRE 85  
20025 LEGNANO MILANO  
Italy

**EU Contribution:** €422,625

### **Nhoe - Societa' A Responsabilita' Limitata**

**Address:**

VIA SANGRO 5  
00040 POMEZIA  
Italy

**Organisation Website:**

<http://www.nhoe.it>

**EU Contribution:** €375,000

## Technologies:

Noise testing, modelling and reduction  
Methodologies and tools to mitigate the impact of aviation noise

**Development phase:** Research/Invention

**STRIA Roadmaps:** Vehicle design and manufacturing

**Transport mode:** Air transport

**Transport sectors:** Passenger transport, Freight transport  
Environmental/Emissions aspects, Other

**Transport policies:** specified

**Geo-spatial type:** Other

