

PROJECT

SUREAL-23

Understanding and measuring SUB-23 nm particle emissions from direct injection engines including REAL driving conditions

Funding: European (Horizon 2020)

Duration: Oct 2016 - Dec 2019

Status: Complete

Total project cost: €3,706,213

EU contribution: €3,428,713



Call for proposal: H2020-GV-2016-INEA

[CORDIS RCN : 206280](#)

Background & policy context:

A large proportion of the total number of particles emitted from direct injection engines are below 23 nm and although the EU aims to regulate those emissions and impose limits for new light duty vehicles, this is not yet possible due to the absence of accurate quantification methods, especially under real driving conditions. The main reason for this is the absence of adequate knowledge regarding the nature of sub-23 nm particles from different engine/fuel combinations under different operating conditions.

Objectives:

SUREAL-23 aims to overcome such barriers by introducing novel measurement technology for concentration/size/composition measurements. The recently established supercontinuum laser technology will be coupled to photoacoustic analysis and will also be employed for photoelectric ionization aerosol charging to achieve real-time, composition size-specific analysis of the particles. In parallel, state of the art aerosol measurement techniques will be advanced for better compatibility with sub-23 nm exhaust particles as well as on-board use. The developed instrumentation will assess sub-23 nm particle emissions from both Diesel and GDI vehicles accounting for effects of the fuel, lubricants, after treatment and driving conditions for existing and near-future vehicle configurations. The most suitable concepts will be developed for PN-PEMS applications and evaluated accordingly. The project will provide measurement technologies that will complement and extend established particle measurement protocols, sustaining the extensive investments that have already been made by industry and regulation authorities.

The project will deliver systematic characterization of sub 23-nm particles to facilitate future particle emission regulations as well as to assess any potential trade-off between advances in ICE technology towards increased efficiency and emissions. The consortium consists of European and US organisations, which are leaders in the field of aerosol and particle technology.

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:

Ethniko Kentro Erevnas Kai Technologikis Anaptyxis

Address:

Charilaou Thermi Road
57001 Thermi Thessaloniki
Greece

Organisation Website:

<http://www.certh.gr>

EU Contribution: €960,750

Partner Organisations:**Centro Ricerche Fiat - Societa Consortile Per Azioni****Address:**

Strada Torino, 50
10043 ORBASSANO (TO)
Italy

Organisation Website:

<http://www.crf.it>

EU Contribution: €482,500

Fachhochschule Nordwestschweiz**Address:**

Schulthess-Allee 1
5201 Brugg
Switzerland

EU Contribution: €0

Nkt Photonics A/s**Address:**

BLOKKEN 84
3460 BIRKEROD
Denmark

Organisation Website:

<http://www.nktphotonics.com>

EU Contribution: €446,250

Consiglio Nazionale Delle Ricerche**Address:**

Piazzale Aldo Moro
185 Roma
Italy

Organisation Website:

<http://www.cnr.it>

EU Contribution: €320,000

Sociedad Europea De Analisis Diferencial De Movilidad SI**Address:**

Jose Lazaro Galdiano 1
28036 Madrid
Spain

EU Contribution: €708,650

Ifp Energies Nouvelles**Address:**

1et 4 avenue de Bois-Préau
92500 RUEIL MALMAISON
France

Organisation Website:

<http://www.ifp.fr>

EU Contribution: €510,563

Technologies:

Emissions control systems
Nano-particle emission measurement system

Development phase: Research/Invention

STRIA Roadmaps: Vehicle design and manufacturing

Transport mode: Road transport

Transport sectors: Freight transport

Transport policies: Environmental/Emissions aspects

Geo-spatial type: Other