

Initiative Towards sustAinable Kerosene for Aviation







State of the art on aviation fuel

EBTP 6th Stakeholder Plenary Meeting (SMP6) - Biofuels for Low Carbon Transport and Energy Security







1. Background

ITAKA is a collaborative project framed in the implementation of **GLOBAL**, **EU** and **NATIONAL** policies:

2009: 1st International Conference on Aviation Biofuels held by **ICAO**

2010: SPAIN sets off a study to explore the potentials of aviation biofuels

2011: The EC presents the EU Advanced Biofuels Flightpath

2011: SPAIN launches the National Bioqueroseno Initiative

2012:



FP7 2012 CALL





Topic ENERGY.2012.3.2.2: Development and testing of advanced sustainable bio-based fuels for air transport







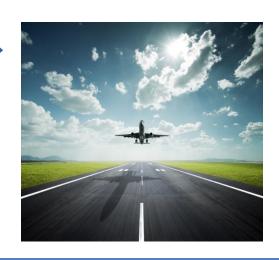
The **EU Advanced Biofuels Flightpath** sets up the objective to achieve **2 million tons of sustainable biofuel per year in 2020**.



A key point is to promote and create an efficient supply chain, from OFFER -biomass cultivation and conversion- up to DEMAND (airlines and standards).

FEEDSTOCKS ENERGY LOGISTICS AVIATION

ITAKA will **link supply and demand** by connecting the **full value-chain**: feedstock grower, biofuel producer, distributor and airlines.





Initiative Towards A sustainable Kerosine for Aviation



2. General description

SEN∱SA

SENASA Project Coordinator

AIRBUS

Airbus Group



Asociatia Centrul de Biotehnologii Microbiene BIOTEHGEN



Camelina Company España (CCE)



Compañía Logística de <u>Hidro</u>carburos S.A. (CLH)



Consorzio per la Ricerca e la Dimostrazione Sulle Energie Rinnovabili (RE-CORD)



École Polytechnique Fédérale de Lausanne (EPFL)



EMBRAER



Manchester Metropolitan University (MMU)



Neste Oil



SkyNRG

Collaborators



Haka

KLM



USAMV- Bucharest

ITAKA is expected to demonstrate the readiness of large-scale production in the EU of sustainable SPK (Synthetic Paraffinic Kerosene), being the first of its kind collaborative project in the EU.









PRODUCTION:

Demonstrate the capability of the whole value chain.

Feedstock

Focus on camelina plantations, to improve key aspects including economic (productivity), social/land use and environmental aspects.



Conversion technology

Using an **existing plant (Neste Oil's Porvoo Refinery)** the target is to enable the commercial scale production at the first-of-its-kind plant in the EU at a large enough scale to reduce production cost beyond the state of the art.









LOGISTICS and LARGE SCALE USE:

Perform large scale testing to obtain data in typical EU flights

Logistics

ITAKA addresses all **downstream logistics** (i.e. blending, transport, storage and airport supply operations) **at large scale**, both through a dedicated and a non-dedicated system.





Engine and fuel systems testing

ITAKA will allow evaluation of the impacts on aircraft operations in typical flights in Europe (long and short range).

Flight-testing is being carried out and relevant datasets shall be collected for the final assessment.





3. Objectives

SUSTAINABILITY ASSESSMENT:

ITAKA will ensure that at least 60% GHG savings are reached by means of a lifecycle assessment.

The **socio-economic effects** of the biofuel production will be addressed.



OUTREACH:

ITAKA also aims to build-up a strong partnership to contribute to a worldwide effort for the development and deployment of sustainable bio jet fuels.

Project results will be disseminated.









Links with other initiatives



















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ITAKA project

PROGRESS AND STATUS







Camelina production

- Camelina oil yields 1st plantation were below expected.
- Better yields are expected with the new varieties and growing protocols
- Crops are dependant on climatic conditions changes

Sustainable feedstock supply

- Aviation sustainability requirements are stringent.
- ITAKA volumes following RSB, EU RED & US RFS2, KLM and Neste Oil company requirements → not harmonized.







Production planning

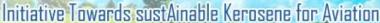
 The uncertainty of the required information regarding feedstock available volumes, quality & certification, impedes a correct production planning in advance.

Renewable diesel market influence.

- Biojet production has to compete with the ever increasing demand of road transport biofuels.
- Lack of alternative production plants in Europe.
 - To date, no other alternative facilities capable of producing (HVO) ASTM compliant biojet have been identified within the EU.









Logistics & testing

Fuel infrastructure

 The 3 stages (refinery to FF, FF itself & FF to aircraft) have different systems with different ownership and operators (airline consortiums, oil companies and other contractors).

Biofuels storage, blending & delivery

- ASTM spec does not cover handling and is silent on the location of blending
- **DEF-STAN 91-91 does not allow blending at the airport** (article D.3.1.3 specifies it shall be done upstream of the airport fuel storage depot).

Blending accountability

Determining biofuel content requires special analysis methods.
 Biofuel content will need to be tracked based on chain of custody documentation on mass-balance basis











Lessons learnt

Feedstock & sustainability

- New agronomical protocol (adapted to European conditions) already implemented in 2014 campaign.
- New camelina variaties adapted to Europe, with higher oil content
- Need for updating sustainability certification schemes



Conversion process

 For production planning, all feedstock documentation regarding volumes, quality and sustainability certification shall be in place 2-3 months before feedstock delivery.

Logistics & testing

 The blending & storage will be performed in a separate location from the pipeline access point terminal.









- On 16 May 2014, it was launched a new series of flights using sustainable biofuel
- 6 months, 20 flights between Amsterdam and Aruba and Bonaire will be operated with an KLM Airbus A330-200 powered by biofuel.
- This is another important step towards proving that more sustainable aviation is possible.
- Key performance parameters on the operation, fuel system and aircraft are being monitorized



SENASA 14



Further information



http://www.itaka-project.eu

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Itaka SENΛSA