

The ITAKA project on aviation biofuels

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FIRST ANNUAL WORKSHOP OF ISAFF
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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***



Background

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).



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





Objectives

1.- PRODUCTION:

Demonstrate the capability of the whole value chain.

Feedstock

Will 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.





Objectives

2.- LOGISTICS and LARGE SCALE USE:

Perform large scale testing to obtain data in typical EU flights

Logistics

ITAKA will address 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.

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



Objectives

3.- 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.



4.- 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





ITAKA project

PROGRESS AND STATUS





Feedstock & sustainability



- **Camelina** production
 - Camelina oil **yields** have been below expected.
 - Future better yields 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**



Conversion process



- 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 → drop-in?**
 - 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 - handling**
 - 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 varieties 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.

Future



- 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 ITAKA 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



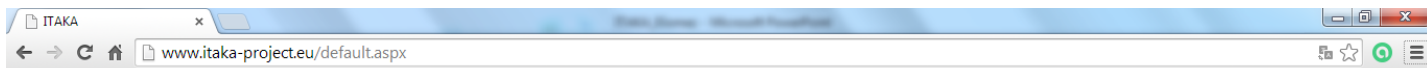
Partners and collaborators

	SENASA		KLM
	Airbus Group		Compañía Logística de Hidrocarburos S.A. (CLH)
	Camelina Company España		École Polytechnique Fédérale de Lausanne
	EMBRAER		Manchester Metropolitan University
	Neste Oil		Asociația Centrală de Biotehnologii Microbiene BIOTEHGEN + USAMvB
	SkyEnergy		Consorzio per la Ricerca e la Dimostrazione Sulle Energie Rinnovabili





<http://www.itaka-project.eu>



Initiative Towards sustainable Kerosene for Aviation



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Sustainable Aviation Fuels Forum

The projects CORE-JetFuel, FORUM-AE and ITAKA announce the Sustainable Aviation Fuels Forum taking place in Madrid on 20th - 22nd October 2014. This event will focus on recent progress and important steps forward in the field of sustainable fuels for aviation. It will bring together stakeholders to share experiences and views, to exchange best practices, to evaluate emerging issues and to jointly elaborate recommendations towards the successful future development of sustainable aviation fuels.



Our Partners



Latest News

- 24 Oct** [Greenair Online](#)
HSBC provides funding for Lanzatech and Virgin venture to produce jet biofuel for flight demonstration
- 24 Oct** [Press Release European Council](#)
2030 climate and energy goals for a competitive, secure and low-carbon EU economy
- 22 Oct** [Yahoo Finance](#)
Boeing, COMAC Open Facility to Transform 'Gutter Oil' into Aviation Biofuel

ITAKA and KLM perform the longest sustainable biojet flight program



Framed on ITAKA project, KLM Royal Dutch Airlines has launched the first set of a program with 20 long-haul biojet flights using an Airbus A330-200 aircraft, which will be the longest worldwide commercial flight program using sustainable aviation biofuel reported to date. Departing from Schiphol airport (The Netherlands), the

aircraft will fly to Aruba and Bonaire *sustainable islands* in the Dutch Caribbean as part of an agenda of activities focused on sustainability.

The fuel to be used in the first flights consists of a 20% blend of Used Cooking Oil-based (UCO) renewable jet fuel supplied by ITAKA partner SkyNRG and standard fossil kerosene. This blend is fully ASTM D1655 compliant and, therefore, suitable for commercial flight operations. Progressively, the biofuel production for the next set of flights programmed within the project is foreseen to come from an energy crop, *Camelina sativa*, which is being currently grown and processed for this purpose.

Camelina cultivation



In the end of June 2014, the Spanish leader in *Camelina sativa* cultivation for biofuel purpose, Camelina Company Espana (CCE), has been involved in a technology's know-how transfer towards the Romanian farmers. The meeting has been organized by CBM Biotechgen and UASMV Bucharest and nine farmers from different geographical regions have honored the invitation. During the meeting, the CCE ITAKA representative has presented the *Camelina sativa* cultivation technology specific to the arid regions as found in Spain.

Last updates

- **03-Sep:** Progress & Results
- **03-Sep:** Camelina Cultivation
- **03-Sep:** About Itaka
- **03-Sep:** Dissemination



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