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***

SENASA

Inmaculada Gómez - *Brussels 15 October 2014*

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***

1. 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.

2. General description

SENASA	SENASA Project Coordinator
AIRBUS GROUP	Airbus Group
BIOTEHGEN	Asociatia Centrul de Biotehnologii Microbiene BIOTEHGEN
camelina company España	Camelina Company España (CCE)
CLH	Compañía Logística de Hidrocarburos S.A. (CLH)
RE-CORD	Consorzio per la Ricerca e la Dimostrazione Sulle Energie Rinnovabili (RE-CORD)
EPFL ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE	École Polytechnique Fédérale de Lausanne (EPFL)
EMBRAER	EMBRAER
Manchester Metropolitan University	Manchester Metropolitan University (MMU)
NESTE OIL	Neste Oil
SkyNRG	SkyNRG

Collaborators

KLM	KLM
USAMV	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.

3. Objectives

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.

3. Objectives

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

CORE-JetFuel

FORUM-AE

CAAFI
COMMERCIAL AVIATION ALTERNATIVE FUELS INITIATIVE

aireg
Aviation Initiative for Renewable Energy in Germany e.V.

bioqueroseno.es
Iniciativa española para la producción y consumo de bioqueroseno para la aviación

ISAFF
Italian Sustainable Aviation Fuel Forum

MASBI

NARA
Northwest Advanced Renewables Alliance

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ITAKA project

PROGRESS AND STATUS

Feedstock & sustainability

- **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**.

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

- 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.

Lessons learnt

- 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

Further information

http://www.itaka-project.eu