ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced Biofuels *Flight Path* Initiative

Presented by: César Velarde

SENASA

Observatory of Sustainability in Aviation

OBSA

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced ***Biofuels Flight Path*** *Initiative*

The European Advanced Biofuels *Flight path* Initiative

CONTENT

1. EU goal 2020
2. How to achieve?
3. 2015, 2018, 2020 milestones and estimated costs
4. Financing mechanisms
5. First Steps: EU current initiatives on-going
6. Case study: Spanish Initiative for Aviation Biofuels

SENASA

OBSA

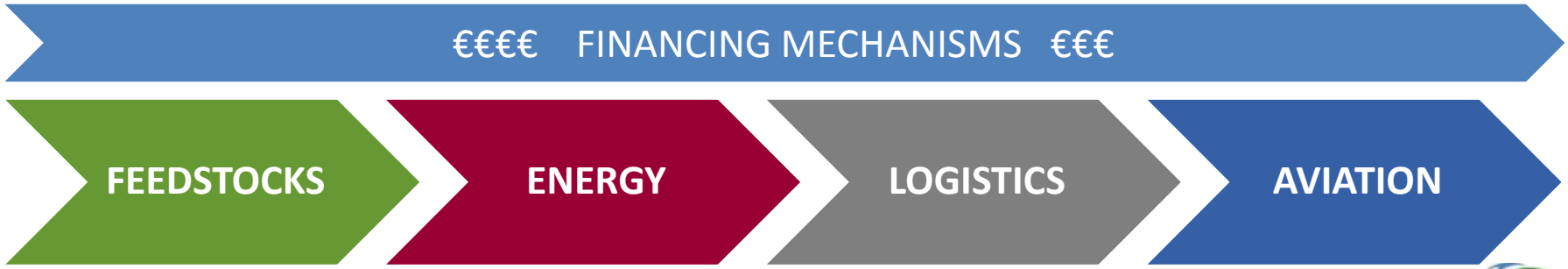
ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced
Biofuels Flight Path
Initiative

GOAL by 2020:

Achieve an annual production of 2 million tons of sustainably produced biofuel for aviation in the EU

Voluntary commitment to promote the deployment of sustainable biofuels for aviation, through establishing the appropriate financial mechanisms.



SENASA

OBSA

How to achieve?

Identification of **critical issues and actions** to address them, such as:

- ✓ type of biofuel and plants that need to be built,
- ✓ coordination and synergies among EU initiaties to be establised,
- ✓ reliable financial mechanism to be constructed.

Implementation Plan > Biofuels ***Flight path***
2011-2020 in two steps

2011: Presentation + Stakeholders Workshops

By 2015 operation of the first of its kind plants

By 2018 operation of second series plants

SENASA

OBSA

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced ***Biofuels Flight Path*** *Initiative*

2015 Milestones and estimated costs:

- ✓ **Conversion of (HVO) plants** (50 M€)
- ✓ Commissioning of **3 plants for lignocelluloses** based fuel (2 FT plant 500 M€, and 1 HPO plant 250 M€)

Total cost estimates:
1,300 M€

SENASA

OBSA

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced ***Biofuels Flight Path*** *Initiative*

What we need by 2015?

- ✓ Supply chain for **certified sustainable resources**
- ✓ Available **financial mechanisms** for investors
- ✓ Development of **quality standards** and certified biofuels
- ✓ On-flig**ht testing**
- ✓ Creation of a **real market** for aviation biofuels
- ✓ **Communication strategy** from aviation industry

SENASA

OBSA

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced ***Biofuels Flight Path*** *Initiative*

2018 Milestones and estimated costs:

- ✓ Construction of the **second series of 4** biofuel production plants at commercial scale **2FT and 2 HPO** (1300 M €)
- ✓ Construction **2 algal oil producting plants** (400 M €)

Total cost estimates:
1,700 M€

SENASA

OBSA

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced ***Biofuels Flight Path*** *Initiative*

What we need by 2018?

- ✓ **Commercial flights** using bio-kerosene blends.
- ✓ Supply of **affordable algae and microbe oils** to be used as the raw material for existing and new HVO plants.

SENASA

OBSA

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced ***Biofuels Flight Path*** *Initiative*

2020 Milestones and estimated costs:

- ✓ Full deployment of at least **2 million tons** per annum.
- ✓ **Available supply** of sustainably produced oils.
- ✓ **9 Plants** producing with advanced technologies.
- ✓ Most EU **airports operating** with biofuel blends.

Total cost estimates:
3,000 M€

SENASA

OBSA

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced ***Biofuels Flight Path*** *Initiative*

Financing mechanisms

Lignocellulosic biofuel technologies potentially commercially viable BUT

- ✓ **Banks consider the sector risky**
- ✓ **Reluctant for loans**

The EU **Strategic Energy Technology Plan** establishes several financing mechanisms, are analyzed in

"***The SET Plan: From Concept to Successful Implementation"****

SENASA

* Centre for European policy Studies

OBSA

Financing mechanisms

- ✓ FP7 **Risk Sharing Financial Facility** (RSFF)
- ✓ EU **Project bonds**
- ✓ **NER 300 Programme**, under Emission Trading Directive
- ✓ **Innovation/Technology accelerator** (not yet operative)
- ✓ **Other fiscal mechanisms:** low interest rates, equity capital

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS

WORKSHOP

The European Advanced
Biofuels Flight Path
Initiative

First Steps: EU current initiatives on-going

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

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

AIRBUS

AIR FRANCE

SENASA

OBSA

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced *Biofuels Flight Path* Initiative

Spanish initiative for the production and consumption of biojet fuel for aviation

bioqueroseno.es

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

GOBIERNO DE ESPAÑA – MINISTERIO DE INDUSTRIA, TURISMO Y COMERCIO

GOBIERNO DE ESPAÑA – MINISTERIO DE FOMENTO

GOBIERNO DE ESPAÑA – MINISTERIO DE MEDIO AMBIENTE Y MEDIO RURAL Y MARINO

Management: AESA, SENASA, AIRBUS

Agricultural

Raw materials
- Identification and raw materials analysis
- I+D
- Pilot project development

Use of subproducts
- Use of crop subproducts for animal feed
- Test
- Certification

camelina company España

tecBIO Tecnología y Biomasa Sostenible

REPSOL

Tecnological

Production process
- I+D
- Analysis of process technologies
- Biokerosene pilot production

REPSOL, CEPSA, UOP A Honeywell Company, tecnalia Corporación Tecnológica

Aeronautical

Logistic
- Transportation, storage and distribution
- Airport availability

Qualification
- Lab analysis
- Engine tests

Flight tests

CLH, AIRBUS, SENASA, IBERIA, pullmantur air

Sustainability: Ministerio de Ciencia e Innovación – Ciemat Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas; RSB Roundtable on Sustainable Biofuels; OBSA

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS

WORKSHOP

The European Advanced
Biofuels Flight Path
Initiative

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

Roadmap

Started in June 2010, the **Spanish initiative for the production and consumption of biojetfuel for aviation** has established the following roadmap:

PHASE I.a
FEASIBILITY STUDY

June 2010 – October 2011
Comprehensive feasibility analysis of the biojetfuel production value chain, including its environmental sustainability, and its social and economic viability. Selection of technological pathways adapted to national conditions, and the European context.

PHASE I.b
DEMONSTRATION

September 2011 – 2013
Demonstration of the most promising developments according to the results on PHASE I.a. Revision, adjustment and deeper definition of the WP.

PHASE II
IMPLEMENTATION

2014 – onwards
Implementation and scaling of the production process based on the results of PHASE I.b.

OBSA **Initiative's Secretariat**

SENASA

Observatory of Sustainability in Aviation
SENASA - Avenida de la Hispanidad, nº 12
28042 Madrid, Spain / Tel: (+34) 91 301 98 47
Email: fuels@obsa.senasa.es Web: www.bioqueroseno.es

ICAO AVIATION AND SUSTAINABLE ALTERNATIVE FUELS WORKSHOP

The European Advanced ***Biofuels Flight Path*** *Initiative*

Thank you!

cvelarde@senasa.es

Observatory of Sustainability in Aviation

SENASA

OBSA