



camelina
company
España

**Sustainable camelina
value chain for biojet
fuel production**

**FIRST ANNUAL WORKSHOP OF ISAFF
ROME, 4 NOVEMBER 2014**

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A. ITAKA PROJECT

A. ITAKA PROJECT

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



First of its kind project developing of a **full value-chain** in Europe to produce **sustainable drop-in biojet** at large scale.

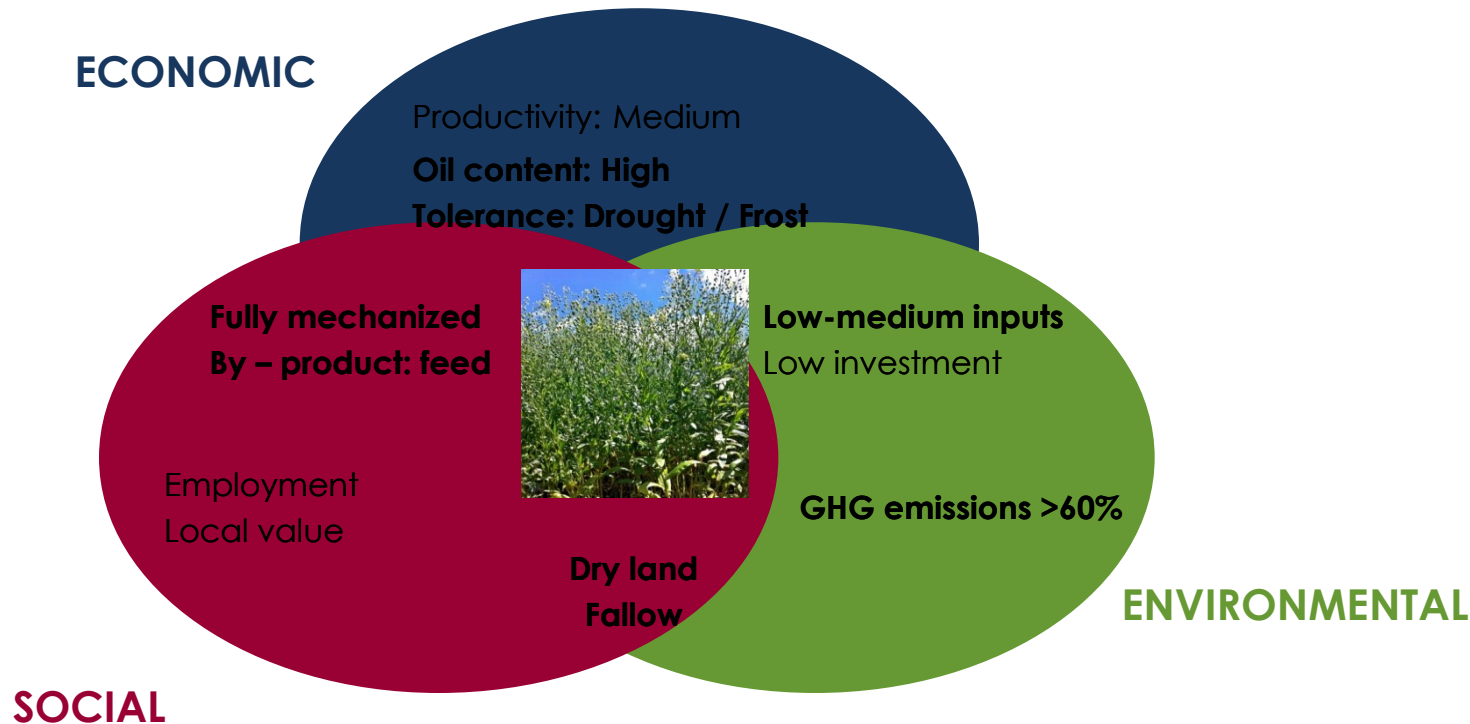


A key point is to promote and create an efficient supply chain, from OFFER -biomass cultivation and conversion- up to DEMAND (airlines and standards).



B. CAMELINA

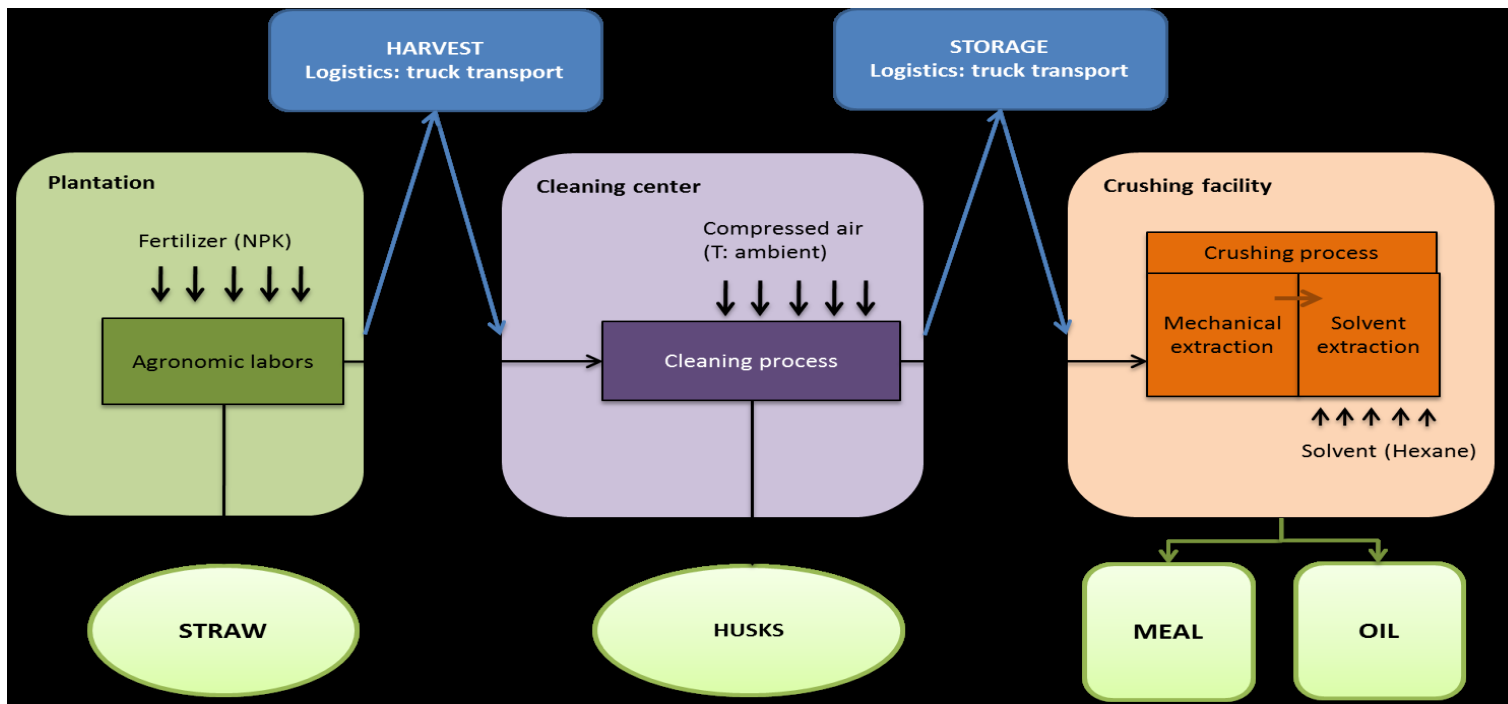
B. CAMELINA



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Camelina oil



By-products



B. CAMELINA

Camelina oil for biofuel production



Characteristics

Aviation industry. Biojetfuel

- ASTM approval (50% mix)

Market

Aviation industry. Biojetfuel

- Advanced European Biofuel Flightpath
- Objective: 2 Mt in 2020

B. CAMELINA

Camelina meal



Characteristics

Competitive advantages

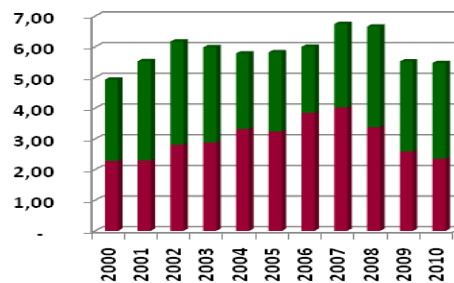
- High protein content
- High quality animal feed

Product use

- FDA approval (2009)
- EU catalogue for animal feed (2011)

Market

Soy importations – Spain > 5 M Tm/year.



- Soy beans (M Tm)
- Soy meal (M Tm)

B. CAMELINA

Camelina husks



Characteristics

Competitive advantages

- High fiber content
- Animal feed supplement

Product use

- Animal feed – Diet complementation
- EU catalogue - undergoing

Camelina straw



Characteristics

Competitive advantage

- ↑ energy content
- ↓ ash content

Product use

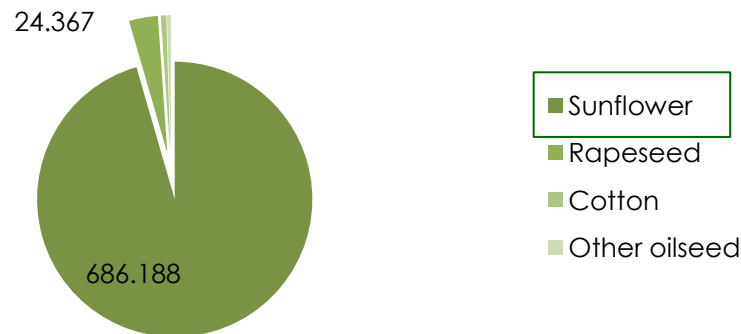
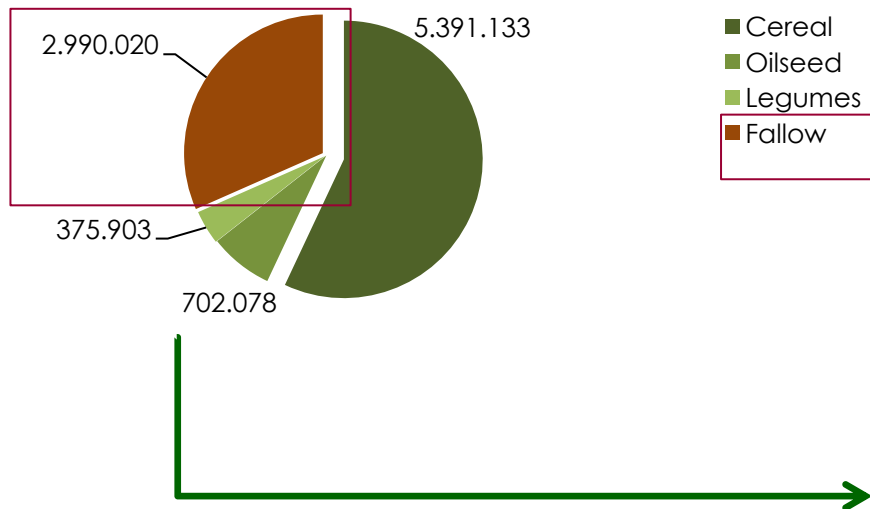
- Biomass power plants

C. SUSTAINABILITY APPROACH

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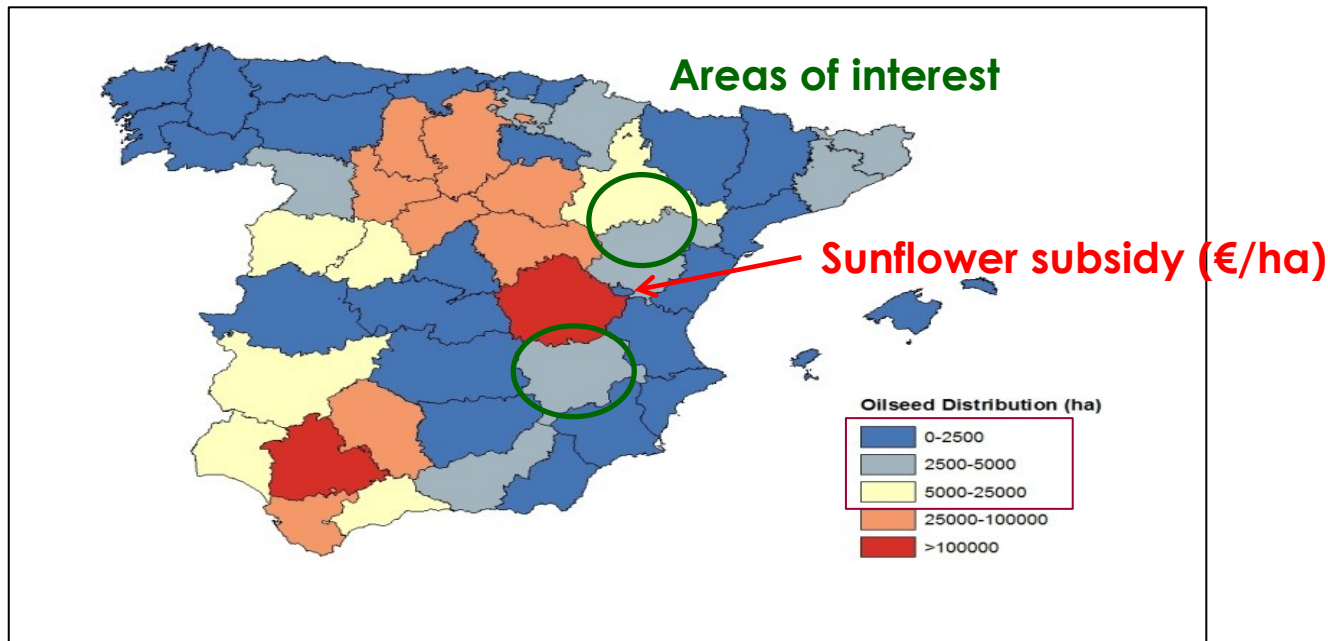
Arid dryland production in Spain

CCE approach



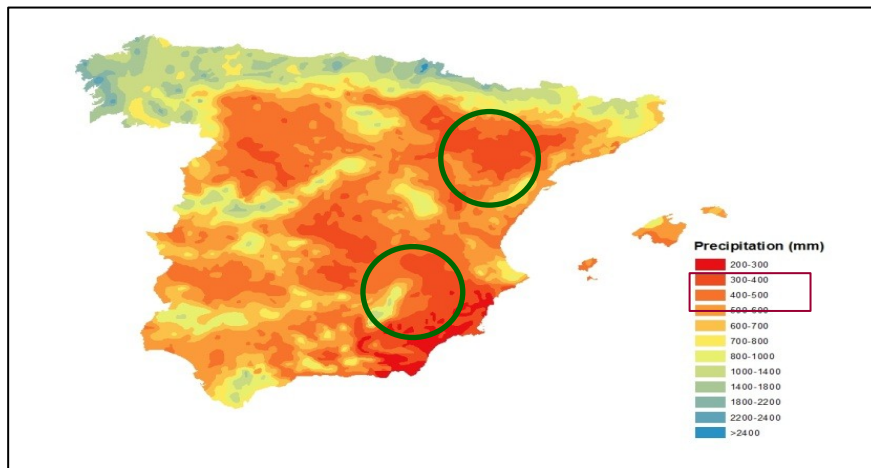
C. SUSTAINABILITY APPROACH

Oilseed production in Spain

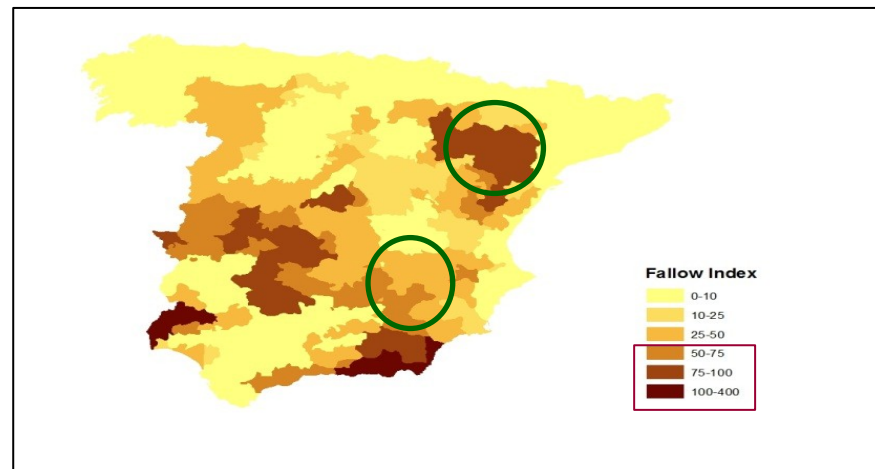


C. SUSTAINABILITY APPROACH

Areas of interest – conditions



300-400 mm/year



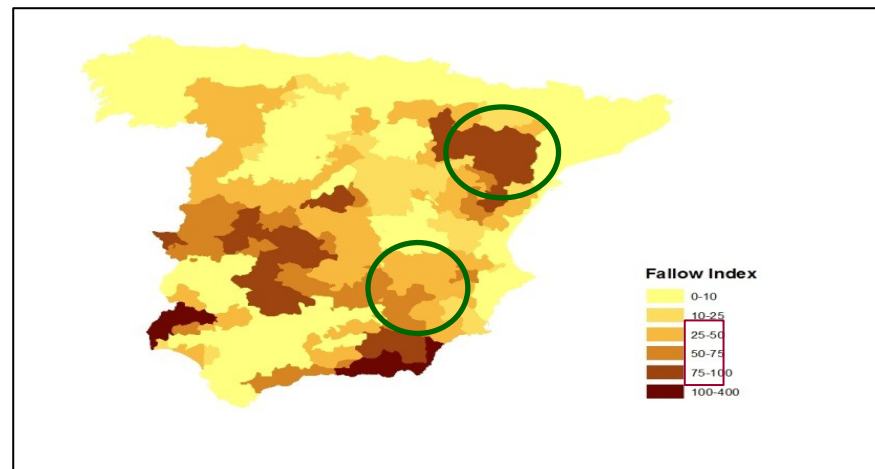
Very high fallow index

C. SUSTAINABILITY APPROACH

Areas of interest – potential

Acreage (ha) 2011	Cereal	Fallow land
Area 1 (CLM)	1.396.345	993.395
Area 2 (Aragón)	784.369	441.750
TOTAL	2.180.714	1.435.145

**Rotation with traditional cereal
in semi-arid dryland**



C. SUSTAINABILITY APPROACH

Approach → introduce new oilseed crop
→ cereal rotation in fallow land



Oilcrop rotation advantages

- Yield improvement
- Weed control
- Soil degradation reduction
- Soil structure and nutrient cycling

D. SUSTAINABILITY CERTIFICATION

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Different sustainability criteria

1. EU RED - RSB certification scheme



2. SKYNRGY Sustainability Board



3. US – EPA recordkeeping requirements



D. SUSTAINABILITY CERTIFICATION

1. RSB certification



> 60%
emission
reduction

Lifecycle Step	Improvement
Feedstock Production	Productivity/fertilization
& Transport	Cleaning poles
& Cleaning	Cleaning efficiency
& Transport	=
& Crushing	Efficiency: process + energy
& Transport	=

D. SUSTAINABILITY CERTIFICATION

2. SKYNRGY Sustainability Board

Board:

- Dutch wing of the World Wide Fund for Nature (WWF-NL)
- Solidaridad
- Copernicus Institute of Utrecht University

Input information

- Quick scan
- RSB audit information



SKYNRG Sustainability Board has given a positive advice for the ITAKA camelina volumes

D. SUSTAINABILITY CERTIFICATION

3. US EPA requirements

Evidence that the land from which the feedstock was obtained was cleared or cultivated prior to December 19, 2007 and actively managed or fallow, and nonforested on December 19, 2007.



SIGPAC tool



Extraordinary requirement to the Ministry of Agriculture.

E. ITAKA CAMELINA PLANTATIONS

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Technical issues

Weed infestation



- *Herbicides for camelina are required in fields with excessive weed infestation*
- *No herbicides approved in Spain*

Spanish Ministry of Agriculture:

→ **Exceptional approval for herbicide application in camelina plantations (broad and narrow leaf control).**

E. ITAKA CAMELINA PLANTATIONS

Industrial issues

Industrial process



- *Slow process*
- *Low efficiency*

Fine tune machinery in order to reduce harvest impurities and increase process efficiency.

Harvest

- **Cleaning process**
- **Crushing**

E. ITAKA CAMELINA PLANTATIONS

Cultural issues

New crop



- Usually, farmers in dryland regions are not used to:
 - Applying background fertilizer (risk)
 - Oil seed crop management

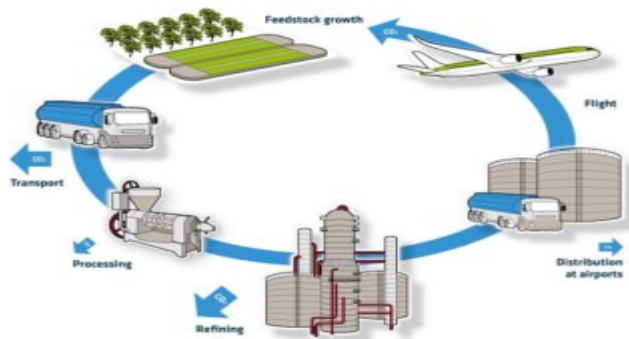
Update the Camelina agronomic protocol and brochures, reinforcing the commercial message.

Introduction of Camelina as an oil crop for CAP subsidies (€/ha).

E. ITAKA CAMELINA PLANTATIONS

Value chain issues

Value chain collaboration



- Production requirements
→ **Quality, traceability & supply procedures very stringent**
- Sustainability requirements
→ **Criteria not harmonized and it is very challenging for any agricultural production**

F. Conclusions

F. ITAKA CAMELINA ACHIEVEMENTS

Large scale sustainable value chain implemented



Camelina oil production performed in large scale facilities.

Expansion to a larger scale is feasible and viable.



First camelina feedstock value chain to be RSB certified worldwide.

Other sustainability criteria also addressed and feasible.



Camelina byproducts have shown high quality as well as good market acceptance.

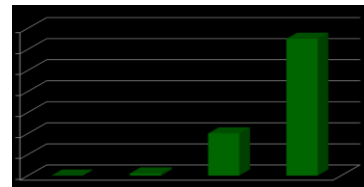
Fully commercialized.

F. NEXT STEPS

**Yield
improvement**



Expansion



Replication





Sowing a sustainable future