



Leadership in renewables Biofuels: the impact of EU R&D funding

Bioenergy | Biofuels | Geothermal | Hydropower | Ocean | Solar PV | Solar thermal | Wind

OBJECTIVES

support within the EU over the past 20 years

A comprehensive study of biofuels research and development (R&D)

of the biofuels sector

Identify the impact of EU R&D support

Understand how the biofuels sector has developed

METHODOLOGY

COLLECTION ACTIVITIES USING A RANGE OF METHODS

EFFECTIVE DATA



DATA FROM EXISTING DATABASES













KEY FIGURES:

FUNDING OF R&D



biofuels projects funded through the Framework **Programmes**

154

(FP5-Horizon 2020)

€161 m

R&D budget grew

from an average of

Programmes (FP5-Horizon 2020) for biofuels

€660 m

EU funding through

the Framework

technologies Top 5

biochemical projects, making it the most funded biofuels R&D topic

61%

of funding to

79%

of biofuels funding



€37 m per year (1995-2008) to an average of €161 m

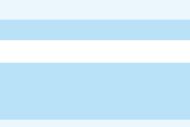
per year (2009-2015)

3. UK 4. Italy 5. Denmark

1. France

2. Sweden

is from the top 5 **Member States**



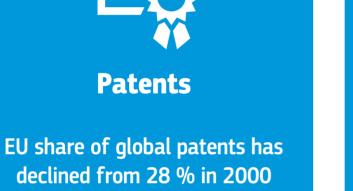
The EU is the second highest region for biofuels R&D funding with an

average of €104 m per year (1995-2015). The USA was the highest

funding region with an average of €220 per year (1995-2015)



IMPACT ON KNOWLEDGE GENERATION



average 290 per year

to 5 % in 2014

The number of EU patents filed

grew from less than 250 per

year in the early 2000s to

approximately 500 per year

between 2008 and 2011. From

2012 onwards, EU patents



Publications

EU-based authors were involved

per year compared with the USA, China, India and Brazil who each produce between 70 and 100 publications per year

IMPACT ON SECTOR

DEVELOPMENT



Additional impacts

The Technology Readiness Level (TRL) of certain advanced biofuels improved - cellulosic ethanol (TRL

2 to TRL 8), pyrolysis oil (TRL 3 to TRL 5) and algae technology (TRL 2 to TRL 3)

1.1 Mt in 2002

6%

of fuels in

transport in 2016

33 Mt

production capacity in 2016

from biofuels rising from

people employed in the **EU** biofuels sector

205 100

in 2016



EU biofuels sector turnover in 2016

€13 bn

13 Mtoe

annual energy production

in 2016, growing from

223 ktoe in 1995

average exports per year (2011-2015) to the rest

€5.5 bn

of the world

Initiative Towards sustAinable Kerosene for Aviation (ITAKA)

use worldwide

 Developed a value chain for commercial biojet fuel in Europe between feedstock and biofuel producers and distributors, airports and airlines. This increased

knowledge for feasibility and

The project developed and tested

advanced and sustainable biojet fuel

and was a cornerstone for biojet fuel

from camelina oil at commercial scale,

scale-up of each process step, so paving the way to commercialisation More than 70 % greenhouse gas savings, 30 % improvement of local

 Commercial flights from Oslo have used biojet fuel since the end of 2015. An important patent was also filed

EXAMPLES OF IMPACT FROM R&D PROJECTS



EUROpean multilevel integrated **BIOREFinery design for sustainable** biomass processing (EUROBIOREF)

The project integrated the

industry and maximised

efficient biorefinery

fragmented European biomass

collaboration to form a viable and

 Covered the whole value chain of sustainable and economical biorefinery processes; and involved many non-edible feedstocks, multiple biochemical and thermochemical processes, fuels and chemicals

Tested 10 new oil crops;

fields; developed 5 value-chain scenarios; and constructed a new, highly efficient pilot plant to process woody biomass Delivered over 300 dissemination activities, 33 patents (10 granted),

89 scientific papers and a

European Master on Biorefineries

established large test feedstocks





Research and Innovation