



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

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

OBJECTIVES

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

support within the EU over the past 20 years

of the bioenergy sector

Identify the impact of EU R&D support

Understand how the bioenergy

sector has developed

METHODOLOGY

COLLECTION ACTIVITIES USING A RANGE OF METHODS

EFFECTIVE DATA













KEY FIGURES:

FUNDING OF R&D



funded through the Framework **Programmes** (FP5-Horizon 2020)

284

bioenergy projects

€183 m

R&D budget grew

from an average of

technologies

€580 m

EU funding through

the Framework

Programmes

(FP5-Horizon 2020)

for bioenergy

Top 5

bioenergy **R&D** topic

32 %

invested in

combustion, making

it the most funded

69%



€55 m per year (1995-2005) to an average of €183 m per year (2006-2015)

The EU region had an average funding in bioenergy R&D of €144 m a year

5. Sweden

(1995-2015), which makes it the highest globally. The USA spent an

average per year of €57 m followed by Japan with €17 m

1. Netherlands

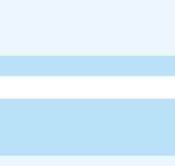
2. Finland

3. Germany

4. Denmark

funding is from the top 5 Member **States**

of bioenergy R&D



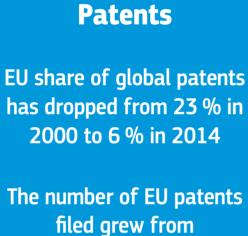


International

funding

IMPACT ON KNOWLEDGE

GENERATION



approximately 200 per year in the early 2000s to over 350 per year between 2007 and 2012, but decreased

back to 200 per year in

2014

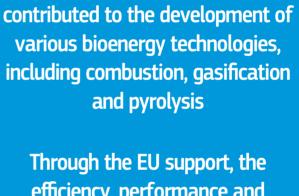


IMPACT ON SECTOR

DEVELOPMENT

Publications

EU-based authors were involved in



Additional impacts

EU framework programme funding

efficiency, performance and emissions of these technologies were improved and newer technologies

(e.g. micro-scale biomass combined

heat and power, and biomass

co-firing with carbon capture and

storage) were demonstrated

growing from 3 000 ktoe in 1995 growing from 21 TWh in 1995

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

€6 billion

people employed in

the EU bioenergy

sector in 2016

5.4%

gross final electricity

175 TWh

annual electricity generation in 2016,

450 000

EU bioenergy sector turnover in 2016

€40 billion

No clear trend due

to large variety of

technologies and

impact of feedstock

consumption from

bioenergy in 2016

14 000 ktoe

annual heat generation in 2016,



prices Jobs



17 % The second of the second



consumption from bioenergy in 2016



Energy Carriers from Biomass by non-food biomass to support a **Means of Torrefaction (SECTOR)** 'resource-efficient' Bioeconomy in **Europe (S2Biom)** • The project developed torrefaction, a technology that turns biomass directly The project focused on supporting

> Research and Innovation

biomass feedstock at local, regional and pan European levels The project developed a knowledge base for the sustainable supply and

Delivery of sustainable supply of

the sustainable delivery of non-food

- logistics of non-food biomass The project developed publicly available strategies and roadmaps that are informed by a
- time, the whole process chain systematically at a demonstration facility Paved the way for the first commercial implementation of torrefaction with important benefits for agriculture, the

wood-processing sector and end users

into a coal-like renewable pellet, so

reducing dependence on fossil fuels

Investigated and optimised, for the first

Production of Solid Sustainable

 Proposed a new standard (ISO 17225-8:2016) and delivered material safety data sheets for torrefied biomass

