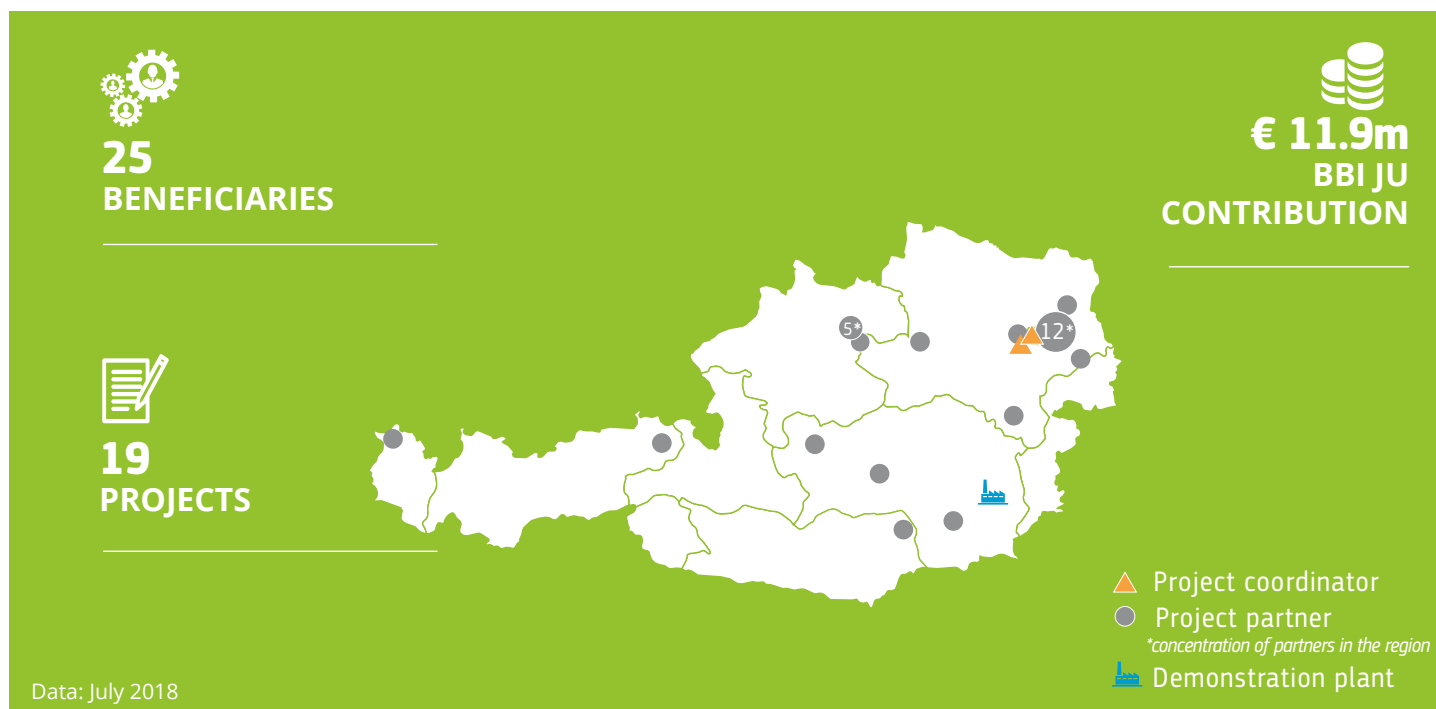




Austria
Österreich



Austria's "Research, Technology and Innovation Strategy (RTI Strategy) for Bio-based Industries" established by the Government in 2014 aims at further developing bio-based industries in the country by promoting research, technology and innovation projects. With an annual turnover of approx. EUR 52 000 million its bioeconomy employs more than 350 200 people.*



With nearly 60% of the beneficiaries being involved in projects focusing on R&I and more than 30% in projects operating on demo-scale, Austria's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as green chemistry and forestry.

Examples of BBI JU projects with Austrian beneficiaries :

- ④ **SUSFERT**'s aim is to produce sustainable multifunctional fertiliser using a specifically developed demonstration plant. It will reduce soil and water contamination, supply European farmers with innovative, more sustainable fertilisers and strengthen rural communities by creating new jobs.
- ④ **SusBind** produces sustainable bio-binders as alternative to those using formaldehyde for wood-based panels at pilot-scale. The project will not only benefit public health and help mitigate climate change but also strengthen the European furniture industry by providing a cost-efficient bio-based alternative and a competitive green advantage over cheaper, imported products.
- ④ **TECH4EFFECT**'s data and knowledge-based management system will enable more efficient forest management and provide users with a competitive advantage. It will reduce the soil and environmental impact from forest operations while improving the socio-economic impact along the value chain.
- ④ **iFermenter** aims to develop an intelligent fermentation system exploiting the sugar mixture in residual lignocellulosic sidestreams. The highly efficient and cost-effective process provides a competitive feedstock alternative while reducing the carbon footprint of comparable processes and contributing to the circular economy.



30%
of projects establish
demo-scale
production facilities



1/3
of beneficiaries
are **SMEs**



350K
people **employed**
in the bioeconomy
sector

*Source: EC Bioeconomy Knowledge Center (2015)



► More information about
BBI JU projects in Austria



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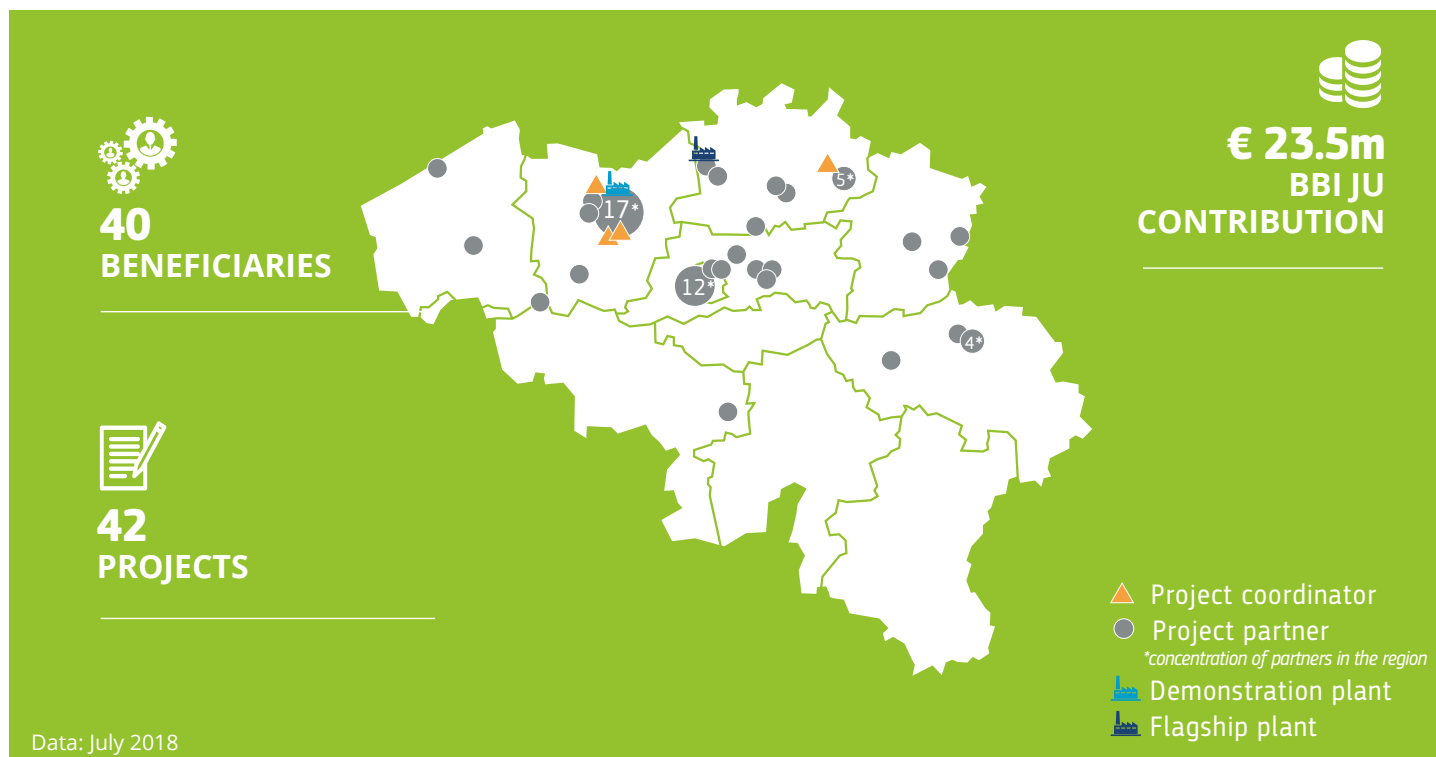


BELGIUM

België - Belgique



Bioeconomy policies in Belgium vary by region. The Flemish government published its first memo of a bioeconomy strategy "Bioeconomy in Flanders" in 2014. In Wallonia, bioeconomy is treated within the wider context of green economy and a dedicated bioeconomy strategy is currently being developed. The Belgian bioeconomy has an annual turnover of approx. EUR 78 100 million and employs nearly 199 000 people.*



With more than 60% of the beneficiaries being involved in R&I projects and more than 30% operating on demo and flagship scale, Belgium's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as bio-based chemicals and biogas. One first-of-its-kind flagship biorefinery funded by BBI JU aims to deliver and to establish bio-based products on the market in the field of biopolymers.

Examples of BBI JU projects with Belgian beneficiaries :

- 🔍 **CARBOSURF** is working to produce specific biochemicals with high market interest: glycolipid biosurfactants and specialty carbohydrates, the first offering a vastly improved environmental compatibility, while the second find application in a very broad range of markets.
- 🔍 **InDIRECT** aims to convert underspent sidestreams from the agricultural and processing sectors into marketable products using a unique and innovative approach based on the use of insect biomass.
- 🔍 **Pilots4U** helps innovators, especially SMEs, bridge the so-called 'Valley of Death' in the innovation phase between the developments in the laboratory and market introduction. To do so, it has set up an easily accessible database of currently more than 260 open access pilot and multipurpose demonstration infrastructures for the European bioeconomy.
- 🔍 **DEMETER** aims to increase biogas yield by at least 20% using a recently developed new enzyme. This will make the use of biogas more available and cost effective.



58%
of BBI JU funding
goes to **SMEs**



1
first-of-its-kind
flagship biorefinery
funded by BBI JU
transforms bio-based
feedstock into
marketable products
such as bottles, films
and fibres



70%
of beneficiaries are
research centers

*Source: Bioeconomy Knowledge Center (2015); German Bioeconomy Council (2015)



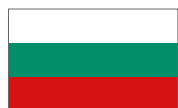
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BULGARIA
България



Bulgaria participates in BIOEAST, a macro-regional bioeconomy initiative being developed by Central and Eastern European countries. The country's activities in the bioeconomy have a total turnover of EUR 13 100 million and employ more than 413 000 people. With its important agricultural sector, agricultural land covers 46% of the total territory of the country, while forest covers 35%, Bulgaria offers enormous potential for the valorisation of agricultural sidestreams and an opportunity for the primary sector to benefit from the bioeconomy.*



The BBI JU activities in Bulgaria concentrate on R&I by funding a project involved in the development of innovative processing technologies in order to promote the efficient use of European aquaculture, fisheries and agriculture sidestreams.

Example of a BBI JU project with a Bulgarian beneficiary :

④ **AQUABIOPRO-FIT**'s main objective is to promote efficient utilisation of European aquaculture, fisheries and agriculture sidestreams in feeds and nutritional supplement products promoting fitness and health. To this end, the project will develop processing technologies to up-concentrate nutrients and bioactives and systematise existing knowledge and technologies on the field of organic nutritional supplements. The safety, bioactivity and acceptance of the developed ingredients and products will be documented through different studies.



1
SME involved in **R&I** activities within BBI JU projects



A project aiming to **reduce waste** from aquaculture and fisheries by **50%**



413k
people employed in the **bioeconomy sector**

*Source: Bioeconomy Knowledge Center (2015)



► More information about
BBI JU projects in Bulgaria



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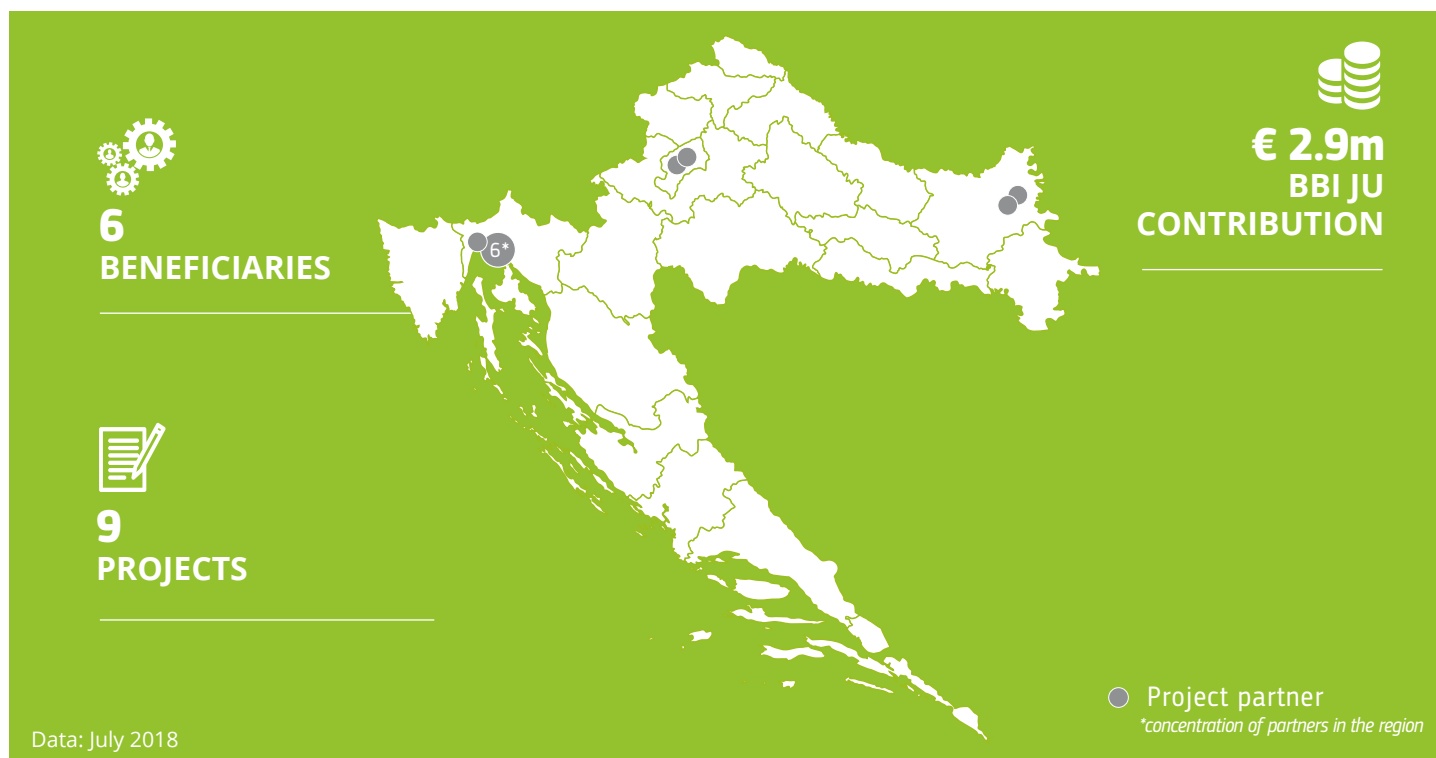
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CROATIA

Hrvatska

Croatia's main potentials in terms of bioeconomy probably lie within its great availability of natural resources, unpolluted arable land and sea, forests and freshwater. The country participates in BIOEAST, a macro-regional bioeconomy initiative being developed by Central and Eastern European countries. Bioeconomy also plays a role in different national strategies such as the "National Strategic Plan for Aquaculture Development" (2014-2020), the "Rural Development Program" (2014-2020) and the "Smart Specialisation Strategy and Action Plan" (2016-2020). The country's activities in the bioeconomy have a total turnover of EUR 10 478 million and employ more than 257 500 people. *



With nearly 30% of the beneficiaries being involved in R&I projects and more than 60% operating on demo scale, Croatia's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as bio-based food packaging and exploitation of biomass.

Examples of BBI JU projects with Croatian beneficiaries :

- ④ **GRACE** will demonstrate the techno-economic viability and environmental sustainability of miscanthus and hemp biomass-based value chains using marginal, contaminated and unused land. It will therefore support Europe in building its bio-based industry without compromising food security.
- ④ **REFUCOAT** is aiming to develop fully recyclable food packaging with enhanced properties and new functionalities. It will reduce landfill waste, enhance preservation of fresh food produce and improve cost and environmental effectiveness in processing.
- ④ **BIOBRIDGES** aims to increase consumers' and brand owners' confidence and trust while raising awareness to boost the marketability of bio-based products. It will establish close cooperation and partnership between bio-based industries, brand owners, consumers, local communities and authorities.
- ④ **PULPACKTION** will develop cellulose-based packaging solutions for the specific demands of the food and electronic packaging industries. It will reduce dependence on non-renewable fossil fuel-based plastics and deliver a safe 100% bio-based and biodegradable product.



64%
of projects involved
in **demo-scale**
production



1/2
of beneficiaries
are **research**
centers



60%
of BBI JU funding
goes to **SMEs**

*Source: Bioeconomy Knowledge Center (2015)



► More information about
BBI JU projects in Croatia



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CYPRUS
Κύπρος



Cyprus has published two national bioeconomy-related strategies: the "Multiannual national strategic plan for aquaculture 2014-2020" in 2014 and the "National Strategy on Adaptation to Climate Change" in 2017. Cyprus' activities in the bioeconomy have a total turnover of EUR 2 267 million and employ 30 500 people.*



With both beneficiaries being involved in R&I projects, Cyprus' BBI JU activities in the bioeconomy sector therefore revolve mainly around technology innovation in areas such as biochemicals and the production of microalgae biomass.

Examples of BBI JU projects with Cypriot beneficiaries :

- **Prolific** aims to recover significant amounts of proteins/peptides, fibres and other value-added compounds by applying a range of technological processes to agro-industrial residues such as legumes, fungi and coffee. The project will contribute to meet the increasing demand for bio-based molecules and polymers to be used for polymer formulations and applications in the the food, feed, packaging and cosmetic sectors.
- **VALUEMAG** aims to provide ground-breaking solutions for microalgae production and harvesting as well as scaling up biomass transformation systems in order to provide new technologies for aquatic and marine biomass integrated bio-refineries. Biomass from micro-algae is a promising source of primary and secondary metabolite products with considerable use in the aquaculture, food additive industry, bio-fertilization, pharmaceutical and cosmetic industry. In VALUEMAG, nothing is wasted: the cultivated micro-algae are used to develop useful products and the used water is self-cleaned by the cultivation process.



2
SMEs involved
in **R&I** activities
within BBI JU
projects



30.5k
people
employed in the
bioeconomy
sector



2.3 million
annual turnover in
the **bioeconomy**
sector

*Source: Bioeconomy Knowledge Center (2015)



► More information about
BBI JU projects in Cyprus



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DENMARK

Danmark

Denmark's climate provides ideal conditions for agriculture, 61% of its surface is cultivated. The country participates in the 'Nordic Bioeconomy', a macro-regional bioeconomy initiative being developed by Nordic countries. The Danish Government also published a "Plan for growth for water, bio and environmental solutions" in March 2013. The country's activities in the bioeconomy have a total turnover of EUR 52 260 million and employ more than 177 600 people.*



Denmark is set to realise the potential of the bioeconomy with more than 80% of the beneficiaries being involved in R&I projects in areas such as bioethanol production and the production of bio-based chemicals for use in food ingredients, pet food, cosmetics and adhesives.

Examples of BBI JU projects with Danish beneficiaries :

- ④ **MACRO CASCADE** will prove the concept of the cascading marine macroalgal biorefinery that covers the entire technological chain for processing sustainable cultivated seaweed into highly value added products. The outcomes will directly impact the citizens through the jobs it will create.
- ④ **Pro-Enrich** aims to develop a biorefinery approach able to process a wide range of agricultural residues, making it possible for the first time to evaluate multiple feedstocks in a single bio-refining system. It will identify high quantities of high-purity functional proteins and bioactive components for use in food ingredients, pet food, cosmetics and adhesives.
- ④ **TECH4EFFECT**'s data and knowledge based management system will enable more efficient forest management and provide users with a competitive advantage. It will reduce the soil and environmental impact from forest operations while improving the socio-economic impact along the value chain.
- ④ **BIOSKOH** will improve bioethanol yields using easily copied technology at low capital costs. By valorising cellulosic fractions of dedicated crops grown on marginal land, it will regenerate rural areas, bring jobs & investment from industry and support the local economy.



81%
of projects
concentrate on
R&I



1/2
of the
beneficiaries are
research centers



56%
of beneficiaries are
SMEs

*Source: Bioeconomy Knowledge Center (2015)



► More information about
BBI JU projects in Denmark



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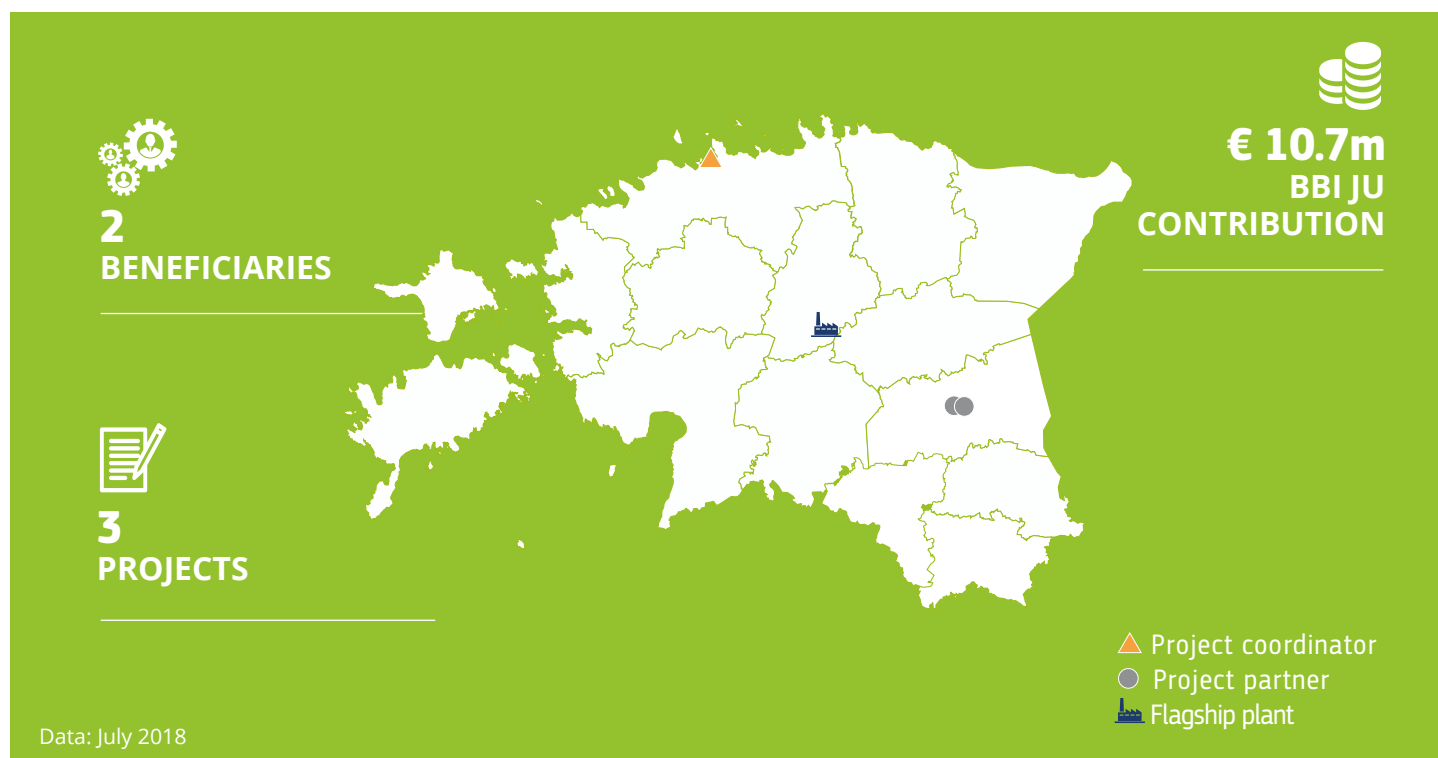
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ESTONIA
Eesti Vabariik



In Estonia, a dedicated Bioeconomy Strategy at national level as well as an "Agriculture and Fisheries Strategy 2030" and "Estonian Forestry Development Plan until 2030" (NFP2030) are currently being developed. The country has also prepared a "Green Paper on Industrial Policy" aiming at higher added-value and more efficient use of bioresources. Moreover, Estonia participates in the macro-regional bioeconomy initiatives BIOEAST and 'Bioeconomy in the Baltic Sea Region'. Already one third of Estonian economy is bioeconomy, which is a good basis for further development of the sector with higher value added from biomass. The country's activities in the bioeconomy have a total turnover of EUR 6 040 million and employ 68 600 people.*



With two of the beneficiaries being involved in coordination and support actions and one operating on flagship scale, Estonia's BBI JU activities in the bioeconomy sector revolve mainly around knowledge development and the creation of networks in the bio-based sector as well as the establishment of bio-based products such as high quality lignin on the market.

Examples of BBI JU projects with Estonian beneficiaries :

- ④ **SWEETWOODS** aims to develop a first-of-its-kind biofractionation flagship plant in Estonia that converts currently poorly valorized hardwood residues into high purity intermediate building blocks of cellulosic sugars and high-quality lignin. Through the construction of the new plant, the project will support regional development and employment.
- ④ **BIOBRIDGES** aims to increase consumers' and brand owners' confidence and trust while raising awareness to boost the marketability of bio-based products. It will establish close cooperation and partnership between bio-based industries, brand owners, consumers, local communities and authorities.
- ④ **BIOWAYS** aims to develop educational materials on the benefits of the bioeconomy and to increase awareness amongst Europe's general public, students, scientists, media and policy makers of the value of bio-based products and applications to industry, the economy and the whole of the wider society, both in terms of what they deliver now and in terms of their future potential.



1
first-of-its-kind **flagship biorefinery** funded by BBI JU is turning wood residues into bio-based building blocks



50%
of beneficiaries are **SMEs**



Bioeconomy accounts for **1/3** of the Estonian economy

*Source: Bioeconomy Knowledge Center (2015); EC DG RTD Mapping of EU Member States' / regions' Research and Innovation plans & Strategies for Smart Specialisation (RIS3) on Bioeconomy - Case Study Report Estonia (2016)



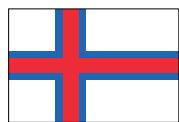
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Faroe Islands

Føroyar - Færøerne



Fisheries and aquaculture are highly important bioeconomy sectors and important contributors to the Faroese economy, representing 20% of the National GDP and accounting for over 91% of total exports in 2018. New and previously underutilised bioresources such as algae and seaweed are also being developed. The country participates in the 'Nordic Bioeconomy' initiative, a macro-regional bioeconomy project focusing on the sector being developed by Nordic countries.



The BBI JU activities in the Faroe Islands concentrate on R&I by funding a project involved in the development of innovative processing technologies in order to convert sustainably cultivated seaweed into highly value added products within market segments of protein feed, human food ingredients and health promoting products.

Example of a BBI JU project with a Faroese beneficiary :

- ④ **MACRO CASCADE** will prove the concept of the cascading marine macroalgal biorefinery that covers the entire technological chain for processing sustainable cultivated seaweed into highly value added products. The outcomes will directly impact the citizens through the jobs it will create.



1
SME involved
in **R&I** activities
within BBI JU
projects



A project
contributing to a
zero waste society
by using
100%
of its **macroalgal
biomass**



15%
of the Faroese
workforce is part
of the **fishing
and aquaculture
bioeconomy**

*Source: National Statistics Institute (2019), Lange et al., Development of the Nordic Bioeconomy (2016)



► More information about
BBI JU projects in Faroe Islands



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Finland
Suomi



Finland's bioeconomy, steered by the "Finnish Bioeconomy Strategy" established in 2014, has an approx. annual turnover of EUR 49 300 million and accounts for 16% of the Gross Domestic Product (GDP). In total, it employs more than 190 000 people and is mainly generated by the following sectors: agriculture, forestry, food and chemistry.*



Finland has set course for the future with 70% of the beneficiaries being involved in R&I projects in the bio-based sector in areas such as green food packaging and bio-based chemicals. 50% of the BBI JU funding in Finland goes to SMEs.

Examples of BBI JU projects with Finnish beneficiaries :

- 🔍 **NEWPACK** aims to develop a competitive, sustainable and innovative technology for making novel biodegradable plastic food packaging from food waste. It will reduce single-use plastics and the environmental footprint of packaging materials in a circular economy approach.
- 🔍 **SmartLi** extracts previously unrealised value from pulp and paper industry lignin sidestreams in order to reduce dependence on and replace oil-based raw materials. Therefore, it will meet the growing demand for renewable bio-chemicals and materials from more sustainable and renewable alternatives.
- 🔍 The aim of **LigniOx** is to demonstrate the viability of a unique and novel technology for the conversion of lignin-rich sidestreams into high-performance concrete and mortar plasticizers. It will strengthen Europe's competitiveness and promote the shift from a fossil-based economy to a bio and circular economy.
- 🔍 By applying modern technology to forestry techniques, **EFFORTE** aims at enhanced efficiency in forest operations, sustainable forestry, increased forest growth, a cost-competitive bio-based industry and an acceleration of the regional economic development.



50%
of BBI JU funding goes to **SMEs**



19
beneficiaries are **research centers**



Bioeconomy
accounts for
16%
of Finland's GDP

*Source: EC Bioeconomy Knowledge Center (2015)



► More information about
BBI JU projects in Finland



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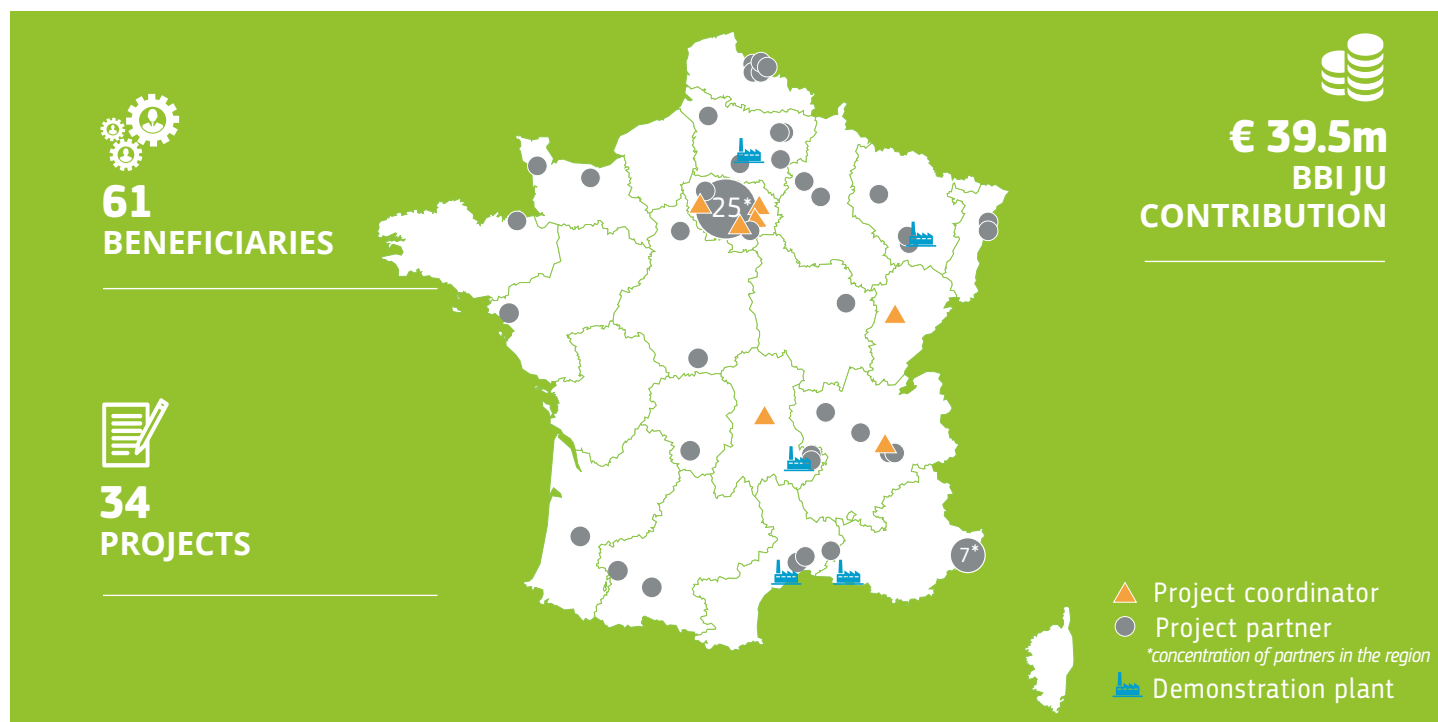
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France
France



France published a national bioeconomy strategy and action plan in 2017. The agriculture and food industries are among the most important economic sectors of the country, followed by the field of green chemistry. French bioeconomy has an annual turnover of approx. EUR 333 000 million and employs more than 1 562 000 people.*



France has set course for the future with nearly 70% of the beneficiaries being involved in R&I projects in the bioeconomy sector in areas such as bio-based chemicals and bioplastics.

Examples of BBI JU projects with French beneficiaries :

- ④ **SYLFEED** will upscale a biorefinery concept that can convert woody biomass into high-value Single Cell Protein (SCP) for use as animal feed, most notably in increasing fish production. This will not only help bridging the European protein gap but also unlock value from underexploited forest and wood residues.
- ④ **ZELCOR** will demonstrate the feasibility of transforming lignocellulose sidestreams into high added-value bio-based products. It combines chemical and enzymatic catalysis with insects-based biological conversion thus reducing waste and improving the resource efficiency and environmental footprint of the whole sector.
- ④ **SpiralG** will use a first-of-its-kind, algae-based demonstration plant to produce a pigment widely used in the pharmaceutical, cosmetic and food industries. It will increase the competitiveness of European biomass producers while reducing the carbon footprint by at least 10% compared to existing practices.
- ④ **SSUCHY** aims at exploiting the intrinsic and differentiating properties of plant fibres and biopolymers derived from lignocellulosic feedstock. It will develop fully bio-based composites with improved functionalities, high socio-economic impacts and minimized environmental impact.



59%
of BBI JU funding goes to SMEs



52
beneficiaries are research centers



Nearly
1.6 million
people employed in the bioeconomy sector

*Source: EC Bioeconomy Knowledge Center (2015); German Bioeconomy Council (2015)



► More information about
BBI JU projects in France



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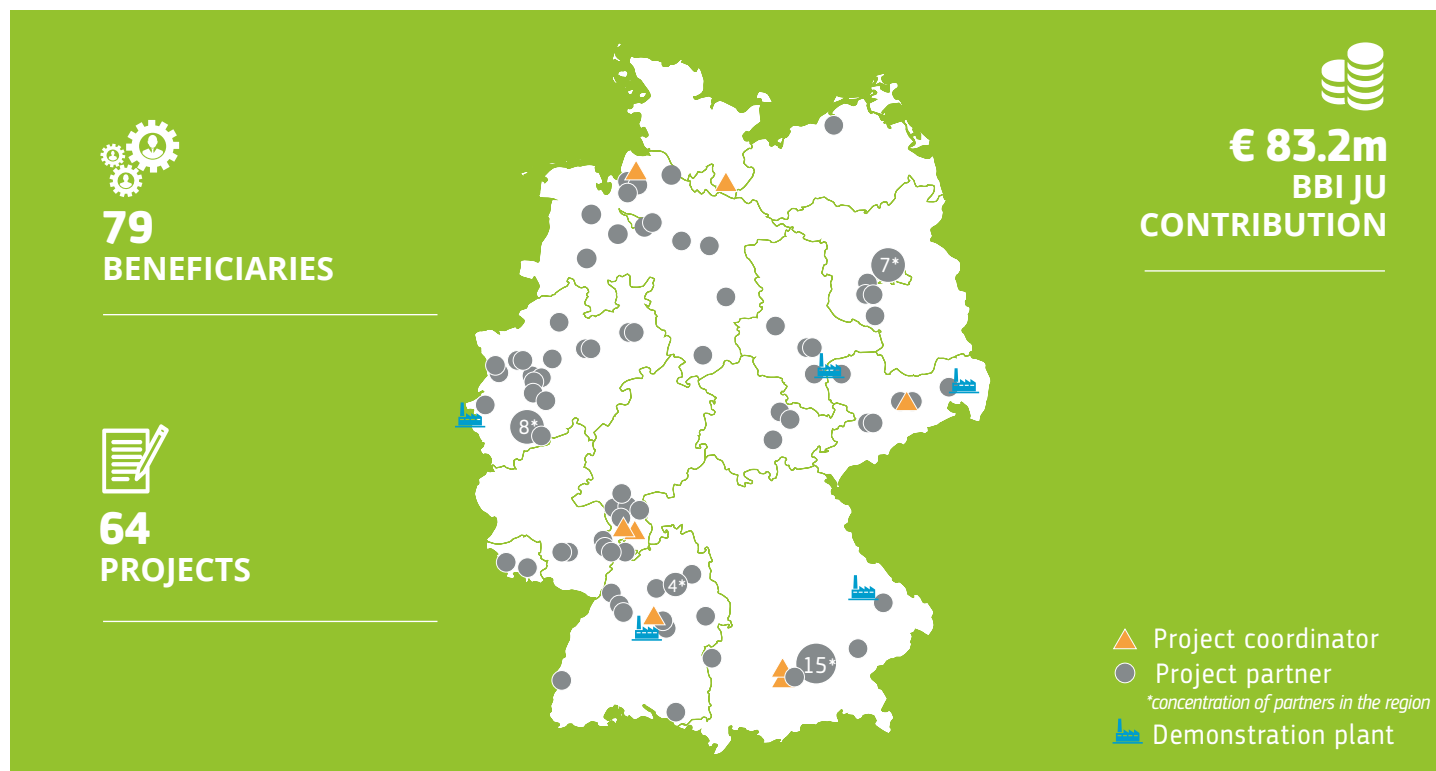
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Germany
Deutschland



Germany has set the course for the bioeconomy at an early stage and is among the world leaders in bioeconomy policy development with a special national research strategy and a bioeconomy policy strategy published respectively in 2011 and 2013. The country's turnover in bioeconomy amounts to approx. EUR 388 900 million and more than 1 929 000 people are employed in the sector.*



In the BBI JU project portfolio Germany is one of the most represented countries with 60% of the projects focusing on research and innovation activities in areas such as green chemistry and bio-based building material.

Examples of BBI JU projects with German beneficiaries :

- ④ **GRACE** will demonstrate the techno-economic viability and environmental sustainability of miscanthus and hemp biomass-based value chains using marginal, contaminated and unused land. It will therefore support Europe in building its bio-based industry without compromising food security.
- ④ By delivering a roadmap and action plan illustrating the 'sweet spots' for Europe's chemical industry towards the bioeconomy, **RoadToBio** will help shape the future of Europe's chemical industry and secure jobs in Europe's rural and less developed regions.
- ④ **LIPES** is dedicated to bringing the first market replication of greener and healthier fatty acids. While aiming at demand-driven innovation based on industrial needs, LIPES will contribute to reaching the European goals on waste reduction by elaborating and evaluating new value chains for agricultural co-products.
- ④ **UNRAVEL** aims to develop high-value applications from lignocellulosic biomass streams such as forest residues and bark, straw and nut shells. By reducing operating temperatures, it will lower the carbon footprint and the overall environmental impact of biorefineries.



Nearly
1/2
of the beneficiaries
are **SMEs**



85%
of beneficiaries are
research centers



Nearly
2 million
people
employed in the
**bioeconomy
sector**

*Source: EC Bioeconomy Knowledge Center (2015)



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BBI JU projects in Germany



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GREECE
Ελλάδα



Greece has numerous strategies related to the bioeconomy, such as the "National Climate Change Adaptation Strategy" (2016), the "National Research and Innovation Strategy for Smart Specialisation", the "National Strategic Framework for Research and Innovation" or the "Rural Development Programme (2014-2020)" published in 2015. The country's activities in the bioeconomy have a total turnover of EUR 30 311 million and employ nearly 627 400 people. *



With nearly 65% of the beneficiaries being involved in R&I projects and more than 20% operating in coordination and support actions, Greece's BBI JU activities in the bioeconomy sector revolve mainly around innovation of technologies in areas such as aquaculture and bio-based chemicals as well as around knowledge development and creation of networks in the bio-based sector.

Examples of BBI JU projects with Greek beneficiaries :

- ④ **BIOWAYS** aims to develop educational materials on the benefits of the bioeconomy and to increase awareness amongst Europe's general public, students, scientists, media and policy makers of the value of bio-based products and applications to industry, the economy and the whole of the wider society, both in terms of what they deliver now and in terms of their future potential.
- ④ **VALUEMAG** aims to provide ground-breaking solutions for microalgae production and harvesting in a circular economy approach. Additionally, it seeks to scale up biomass transformation systems in order to provide new technologies for aquatic and marine biomass integrated bio-refineries.
- ④ **AQUABIOPRO-FIT**'s main objective is to promote efficient utilisation of European aquaculture, fisheries and agriculture sidestreams in feeds and nutritional supplement products promoting fitness and health by developing processing technologies to up-concentrate nutrients and bioactives.
- ④ **BIOFOREVER** aims to convert lignocellulosic feedstocks into chemical building blocks and high added-value products. The project offers job creation in the agricultural/forestry sector and, by creating bio-refinery technologies as export products, positions European ports for the transition to renewables driven business.

*Source: Bioeconomy Knowledge Center (2015)



63%
of BBI JU
funding goes
to **SMES**



More than
60%
of projects focus
on **R&I**



Nearly
6%
of the population
employed in the
bioeconomy sector



► [More information about
BBI JU projects in Greece](#)



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HUNGARY

Magyarország



In Hungary, a dedicated Bioeconomy Strategy at national level is under development. The country participates in BIOEAST, a macro-regional bioeconomy initiative being developed by Central and Eastern European countries. Hungary's activities in the bioeconomy have a total turnover of EUR 26 286 million and employ more than 390 600 people.*



With two of the beneficiaries being involved in demonstration actions and two operating on flagship scale, Hungary's BBI JU activities in the bioeconomy sector revolve mainly around demonstration of technologies and products and their establishment on the market in areas such as bio-based chemicals, building blocks and biofuels.

Examples of BBI JU projects with Hungarian beneficiaries :

- ④ **AgriMax** will add value to the rural economy, stimulate the creation of new skilled jobs, protect the environment and stimulate new market opportunities by demonstrating the feasibility of extracting high-value compounds from agricultural and food processing waste.
- ④ **LIGNOFLAG** will create an integrated biorefinery that will transform agricultural residues provided by local farmers into liquid transportation fuel, heating power and fertilizer. This flagship project will generate green jobs and economic growth in rural areas without using agricultural land for production.
- ④ **Dendromass4Europe** aims to establish sustainable and regional cropping systems for agricultural dendromass production on marginal land. The dendromass produced will be supplied to bio-based value chains which will create additional job opportunities in rural areas.



1/3

of the beneficiaries aims to establish bio-based products such as **bio-based chemicals and biofuels** on the market



3/4

of beneficiaries are **SMEs**



391k

people employed in the **bioeconomy sector**

*Source: Bioeconomy Knowledge Center (2015)



► More information about
BBI JU projects in Hungary



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Iceland
Iceland



Marine resources dominate the bio-based economy in Iceland. In 2015, Iceland teamed up with Greenland and the Faroe Islands to form a «Nordic Bioeconomy Panel» with the objective to jointly develop a «Nordic Bioeconomy Strategy». The main areas of focus are biotechnology and the blue bioeconomy – the aim of which is to tap and exploit marine bioresources. With several projects aiming at developing the sustainable use of natural resources in the agricultural and marine sectors, Iceland is driving the transition to a knowledge-based bioeconomy in the Nordic region.



With two of the beneficiaries being involved in R&I projects and two operating on demo scale, Iceland's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as food for human consumption and animal feed coming from woody, agricultural and aquatic biomass.

Examples of BBI JU projects with Icelandic beneficiaries :

- ④ **LIBBIO** will support and enhance the European bioeconomy and reduce dependency on oilseed import by using non-GMO European-grown lupin beans to produce high value-added food, animal feed and bio-energy products as well as a number of consumer products.
- ④ **MACRO CASCADE** will prove the concept of the cascading marine macroalgal biorefinery that covers the entire technological chain for processing sustainable cultivated seaweed into highly value added products. The outcomes will directly impact the citizens through the jobs it will create.
- ④ **SYLFEED** will upscale a biorefinery concept that can convert woody biomass into high-value Single Cell Protein (SCP) for use as animal feed, most notably in increasing fish production. This will not only help bridging the European protein gap but also unlock value from underexploited forest and wood residues.



1/3
of BBI JU funding
goes to SMEs



100%
of the
beneficiaries are
research centers



2
SMEs involved
in **R&I** and
demonstration
activities

*Source: Nordic Co-operation Portal (2019)



► More information about
BBI JU projects in Iceland



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Ireland
Ireland



The Irish government has recognised the potential of the bioeconomy and published a "National Policy Statement on the Bioeconomy" in February 2018. The recently created National Bioeconomy Research Centre (Beacon) and the Irish Bioeconomy Foundation (IBF) are creating an ecosystem linking fundamental and industry led research from lab to industrial scale and aim to turn Ireland's bioeconomy into a well-oiled, profitable machine. The bioeconomy's annual turnover in Ireland amounts to approx. EUR 60 000 million and the sector employs more than 181 000 people.*



A first-of-its-kind flagship biorefinery, that will contribute to the creation of over 1,000 jobs in a rural area, represents a significant part of the BBI JU activity in Ireland.

Examples of BBI JU projects with Irish beneficiaries :

- ④ By using a first-of-its-kind integrated biorefinery, **AgriChemWhey** proposes to convert dairy-processing sidestreams into added-value products, developing rural communities by creating local jobs. Replicating this flagship biorefinery has the potential to create over 1,000 rural jobs within four years of project completion.
- ④ **LIBRE** will utilise lignin-rich sidestream feedstock from the pulp and paper industry to create a more resource-efficient and low-emission production process creating higher quality carbon fibre. This will give a competitive edge to end user sectors such as transportation, renewable energy and construction.
- ④ **FUNGUSCHAIN** extracts value from the agricultural waste of commercial mushroom farming and produces a spectrum of bio-based products, notably food supplements for the elderly and plastic products. It uses environmentally friendly techniques that SMEs and local industries can adopt thus stimulating local entrepreneurship and developing rural areas.
- ④ **BIOrescue** aims to develop the concept of an integrated bio-production process based on the cascading use of spent mushroom substrate. Its replication in other mushroom production sites will bring environmental and economic benefits and address the need for development in rural areas across Europe.

*Source: EC Bioeconomy Knowledge Center (2015)



1
first-of-its-kind
**flagship
biorefinery**
converting dairy
sidestreams into
bioproducts



36%
of beneficiaries
are **SMEs**



1/3
of beneficiaries
is **academia**



► More information about
BBI JU projects in Ireland



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Israel
ישראל



The country hosts approximately 300 research groups and 550 companies covering the value chain of alternative fuels. With € 40 bn cumulative capital raised by Israeli start-ups and R&D centers, it is an important center of knowledge and industry in the bioeconomy. The high resource efficiency of agricultural production plays an important role in the optimisation of processes for the sector.



With both beneficiaries being involved in demonstration actions, Israel's BBI JU in the bioeconomy sector revolve mainly around demonstration of technologies and products for the construction and automotive industry.

Example of a BBI JU project with Israeli beneficiaries :

- 🔍 **ReInvent** will develop multifunctional, sustainable and low-cost bio-based soft, semi-rigid and rigid moulded and spraying insulation foam systems with enhanced properties and performance for the construction and automotive industry. These can replace the petroleum-based insulation and structural products currently used in buildings and vehicle interior products.



2
SME involved
in **demo-scale**
activities within
BBI JU projects



100%
of the
beneficiaries are
research centers

*Source: BBI JU Israel State Representative



► More information about
BBI JU projects in Israel



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Italy
Italia



Green chemistry and bio-based textiles are important pillars of the bioeconomy in Italy – the north being mainly industrialised, the south predominantly agricultural. Since 2017 the country has a dedicated bioeconomy strategy at national level. With an annual turnover of approx. EUR 297 000 million and 1 840 000 people employed in the bioeconomy, Italy is one of the leading countries in the European bioeconomy.*



Nearly half of the Italian beneficiaries operate on demo-scale with production facilities demonstrating the feasibility and market readiness of a technology or product. One first-of-its-kind flagship biorefinery funded by BBI JU aims to establish bio-based products on the market.

Examples of BBI JU projects with Italian beneficiaries :

- ④ **FIRST2RUN** grows cardoon on arid and marginal wasteland to deliver bio-based vegetable oils used in the manufacture of bioproducts and bioplastics. This flagship project will generate new incomes for local farmers and create an estimated 600 jobs in an area with a high unemployment rate due to progressive marginalisation of fields.
- ④ **ReInvent** will develop multifunctional, sustainable and low-cost materials and fibres with enhanced properties and performance. These can replace the petroleum-based insulation and structural products used in buildings and vehicle interior products.
- ④ **EMBRACED** will turn Absorbent Hygiene Products (AHP) waste destined to landfill or incineration into valuable bio-based materials such as building blocks, polymers and fertilizers. It actively involves the local community in the collection and recycling of AHP waste and creates new jobs in the value chain.
- ④ **BioBarr** will develop new bio-based and biodegradable food packaging materials using wastes and agro-industrial co-products. This project provides an opportunity for innovation and job creation and allows Europe to reduce its dependency on imported oil. It will generate additional income and sustainable development to rural areas.

*Source: EC Bioeconomy Knowledge Center (2015)



1
first-of-its-kind
flagship biorefinery
funded by BBI JU is
turning vegetable
oil from cardoons
into bioproducts



46%
of beneficiaries
are SMEs



Nearly
1.9 million
people
employed in the
bioeconomy
sector



► More information about
BBI JU projects in Italy



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LATVIA
Latvija



The "Latvian Bioeconomy Strategy 2030", the country's national strategy on bioeconomy, was published in 2017. In 2010, the government published the "Sustainable Development Strategy of Latvia until 2030" which is the result of a participative collaboration approach between experts and the Latvian civil society. The country's activities in the bioeconomy have a total turnover of EUR 6 486 million and employ 130 600 people.*



With one of the beneficiaries being involved in R&I projects and one operating on demo-scale, Latvia's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as bio-based construction material and sugar-based biotechnological applications. One first-of-its-kind demo production facility funded by BBI JU is developing bio-based insulation foam for the automotive and construction industry.

Examples of BBI JU projects with Latvian beneficiaries :

- 🔗 **ReInvent** will develop multifunctional, sustainable and low-cost bio-based soft, semi-rigid and rigid moulded and spraying insulation foam systems with enhanced properties and performance for the construction and automotive industry. These can replace the petroleum-based insulation and structural products currently used in buildings and vehicle interior products.
- 🔗 **US4GREENCHEM** aims to design a biorefinery concept for the complete valorisation of lignocellulosic biomass that is energy and cost-efficient and based solely on green technologies. The project combines enzyme treatment methods with ultrasound pre-treatment capable of breaking up the lignocellulosic matrix with reduced energy input and minimal production of inhibitory by-products. The substrate obtained from the lignocellulosic feedstock is then used in the biochemical field and in order to produce biofuels.



1
first-of-its-kind
demo production facility funded by BBI JU is developing bio-based insulation foam for the automotive and construction industry



40%
of BBI JU funding goes to SMEs



Nearly
7%
of the Latvian population works in the **bioeconomy sector**

*Source: Bioeconomy Knowledge Center (2015)



▶ More information about
BBI JU projects in Latvia



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LITHUANIA
Lietuva



Historically, Lithuania is known for its industrial enzyme production, which has been concentrated in the Baltic country. In 2017, the "Lithuanian Bioeconomy Development Feasibility Study" evaluating the state and potential of bioeconomy in Lithuania was published. The country's activities in the bioeconomy have a total turnover of EUR 11 310 million and employ 217 997 people.*



The BBI JU activities in Lithuania concentrate on R&I by funding a project involved in the development of a biorefinery concept based on the use of enzymes and ultrasound for the conversion of lignocellulosic biomass into chemicals and fuels. The Lithuanian beneficiary, JSC "Biocentras", is a scientific-industrial company established in 1988. The leader in business and science partnership in Lithuania is performing scientific studies and experiments and developing new biological products and technologies.

Example of a BBI JU project with a Lithuanian beneficiary :

🔍 **US4GREENCHEM** aims to design a biorefinery concept for the complete valorization of lignocellulosic biomass that is energy and cost-efficient and based solely on green technologies. The project combines enzyme treatment methods with ultrasound pre-treatment capable of breaking up the lignocellulosic matrix with reduced energy input and minimal production of inhibitory by-products. The substrate obtained from the lignocellulosic feedstock is then used in the biochemical field and in order to produce biofuels.



1
SME involved in
R&I activities



2
young scientists
from Lithuania
received the EUCYS
bioeconomy prize
in 2016 and 2018



Nearly
8%
of the Lithuanian
population works
in the **bioeconomy**
sector

*Source: Bioeconomy Knowledge Center (2015); German Bioeconomy Council (2015); Lithuanian Bioeconomy Development Feasibility Study (2017)



▶ More information about
BBI JU projects in Lithuania



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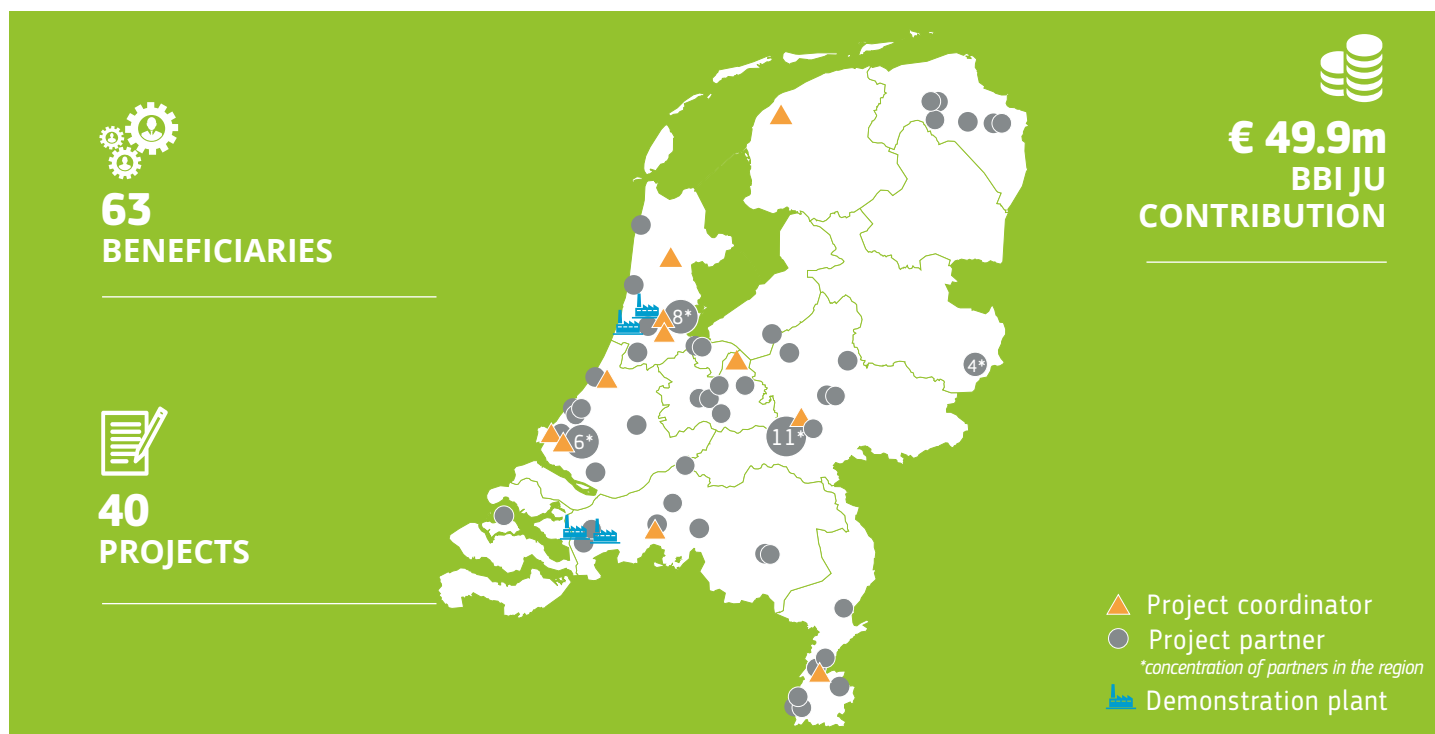
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Netherlands
Nederland



The Netherlands, which possesses a number of strategies closely linked with the bioeconomy, is one of the largest exporters of agricultural products worldwide. Its paper and chemical industries also provide opportunities for bio-based and sustainable economic growth. Currently, more than 359 000 people are working in the bioeconomy which has an annual turnover of approx. EUR 113 000 million.*



With 50% of the beneficiaries being involved in projects focusing on R&I and nearly 40% in projects operating on demo-scale, the Netherlands' BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as green food packaging and bio-based chemicals.

Examples of BBI JU projects with Dutch beneficiaries :

- **PULP2VALUE** intends to demonstrate an integrated and cost effective cascading biorefinery system to refine sugar beet pulp and isolate high value products. It will spur rural development by connecting beet growing areas in new cross-sectorial value chains with various industries.
- A proactive regulatory approach is an important driver in developing emerging industries and attracting investment. The **STAR4BBI** project will help establish a coherent, well coordinated and favourable regulatory framework that helps develop a cutting-edge bio-based economy for Europe.
- **FRESH** develops an innovative, cellulose-based alternative to existing fossil-based plastic trays. The outcome of this demonstration project will be a fully bio-based and biodegradable composite material bringing important benefits for citizens and environment alike.
- **ReSolve** sets out to replace hazardous solvents with safer alternatives derived from non food carbohydrates. These new solvents will have a wide range of applications and will improve public health and safety by reducing the use of the toxic and environmentally damaging substances.
- The **MACRO CASCADE** project will prove the concept of the cascading marine macroalgal biorefinery that covers the entire technological chain for processing sustainable cultivated seaweed into highly value-added products. The outcomes will directly impact the public through the jobs it will create.

*Source: EC Bioeconomy Knowledge Center (2015); German Bioeconomy Council (2015)



85%
of beneficiaries are
research centers



Nearly
40%
of projects involved
in establishing
demo-scale
production facilities



More than
1/3
of beneficiaries
are **SMEs**



▶ More information about
BBI JU projects in Netherlands



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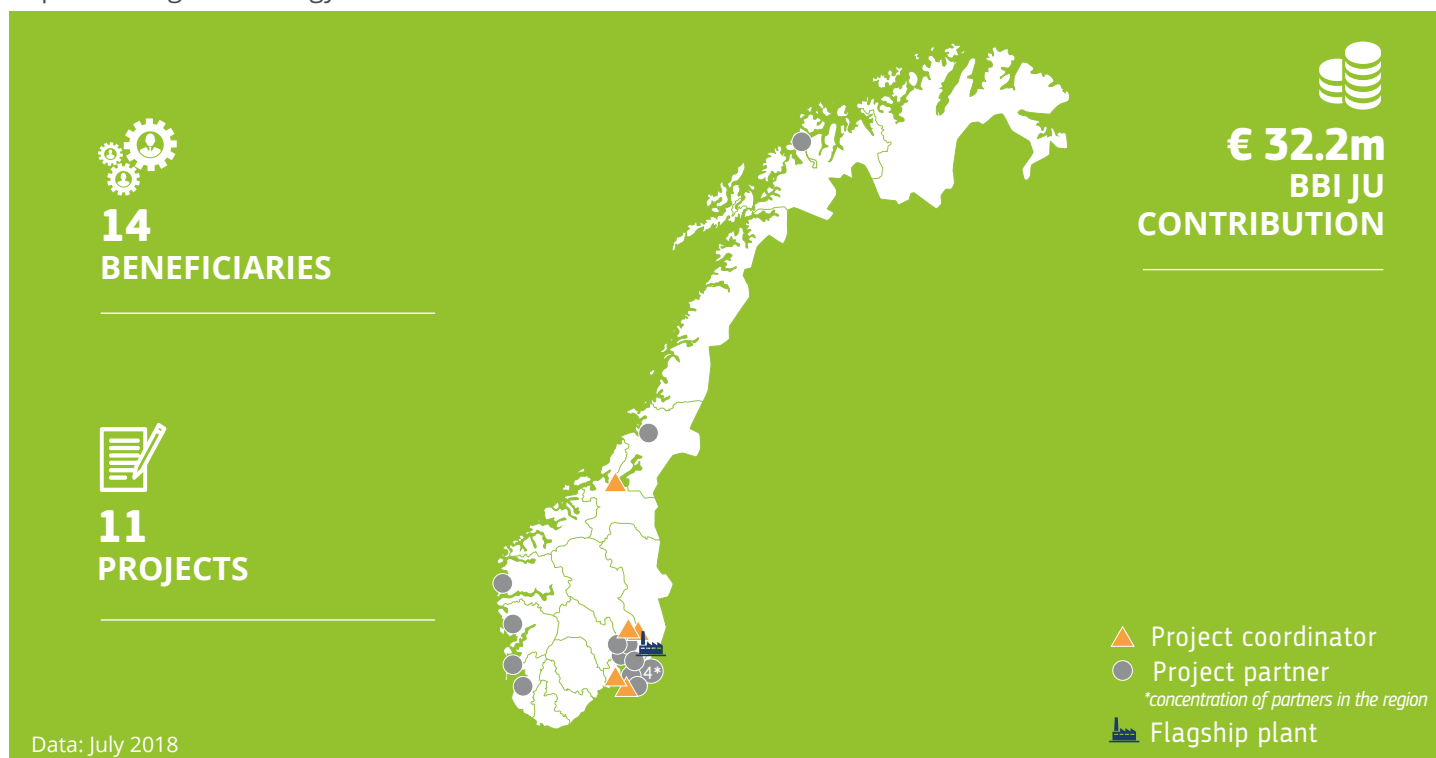
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NORWAY
Norge



In terms of bioeconomy, Norway holds high potential thanks to the abundance and diversity of its natural resources. The wood, paper and food industries are among the main economic sectors and especially its fishing and aquaculture industries increase export revenues. The national "Government's Bioeconomy Strategy" was published in 2016, and several research and innovation programmes, like BIONÆR, BIOTEK2021 and "The biorefinery program" are implementing the strategy.



With 60% of the beneficiaries being involved in R&I projects and 30% operating on demo-scale, Norway's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as bio-based chemicals and food supplements. One first-of-its-kind flagship biorefinery funded by BBI JU aims to establish bio-based products on the market.

Examples of BBI JU projects with Norwegian beneficiaries :

- ④ **Exilva** is extracting value from forestry sidestreams and creating Microfibrillated cellulose (MFC), a high value product with a low CO2 footprint and multiple applications in a range of business and consumer products such as personal care and home care products, cosmetics, adhesives and sealants.
- ④ **AQUABIOPRO-FIT**'s main objective is to promote efficient utilisation of European aquaculture, fisheries and agriculture sidestreams in feeds and nutritional supplement products promoting fitness and health by developing processing technologies to up-concentrate nutrients and bioactives.
- ④ **iFermenter** aims to develop an intelligent fermentation system exploiting the sugar mixture in residual lignocellulosic sidestreams. The highly efficient and cost-effective process provides a competitive feedstock alternative while reducing the carbon footprint of comparable processes and contributing to circular economy.
- ④ **BIOFOREVER** aims to convert lignocellulosic feedstocks into chemical building blocks and high added-value products. The project offers job creation in the agricultural/ forestry sector and, by creating bio-refinery technologies as export products, positions European ports for the transition to renewables driven business.



60%
of projects
involved in
**demo-scale
production**



1
first-of-its-
kind **flagship
biorefinery**
funded by BBI JU is
producing a wide
range of MFC-based
consumer products



More than
1/2
of the beneficiaries
are **research
centers**

*Source: Bioeconomy Knowledge Center (2015); German Bioeconomy Council (2015); The Research Council of Norway



► More information about
BBI JU projects in Norway



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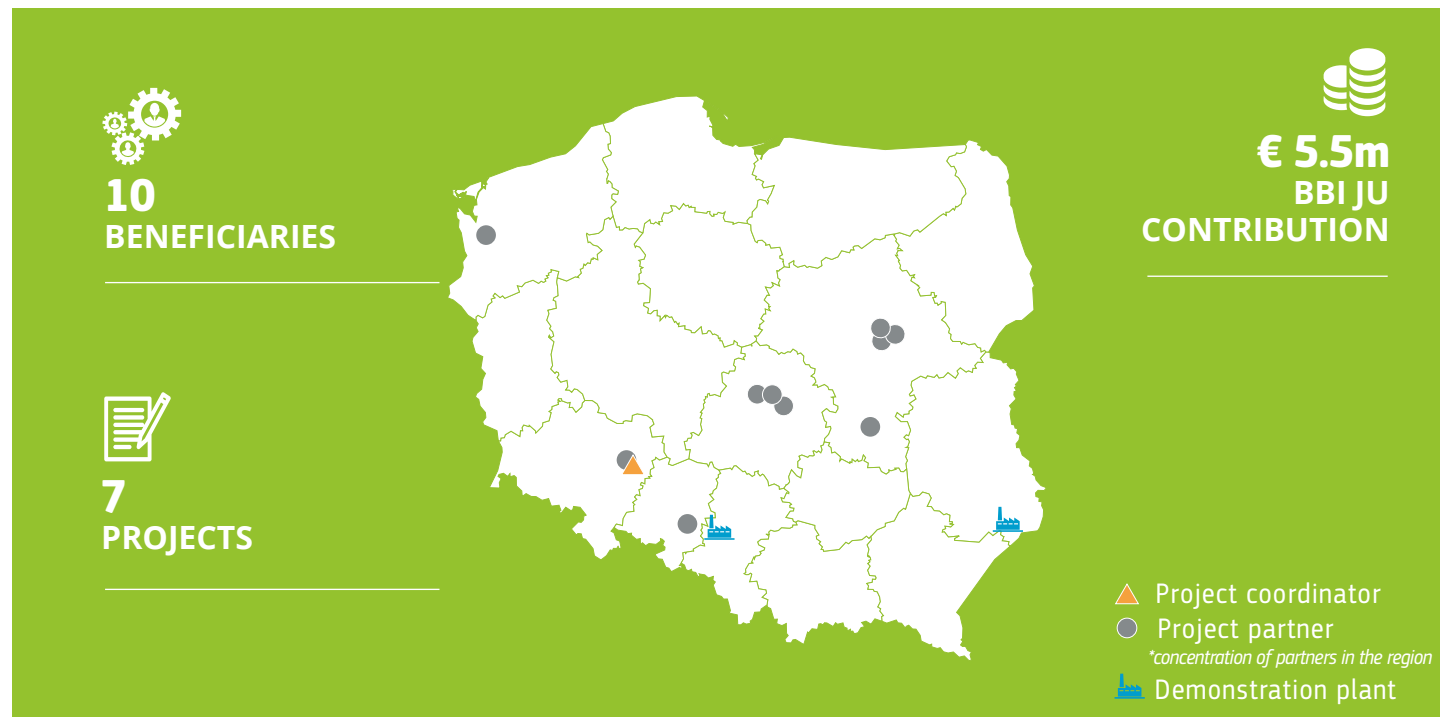
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Poland
Polska



With a 6% contribution to the EU-28 total agricultural output, Poland is the seventh largest agricultural nation in the European Union. Its bioeconomy has a turnover of approx. EUR 115 300 million. The country participates in BIOEAST, a macro-regional bioeconomy initiative being developed by Central and Eastern European countries.*



In 2016, BBI JU signed a Letter of Intent with 8 Polish regions to create synergies and contribute to the development of the Polish bioeconomy. With more than 35% of the beneficiaries being involved in projects focusing on R&I and 55% in projects operating on demo-scale, Poland's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as bioplastics and green food packaging.

Examples of BBI JU projects with Polish beneficiaries :

- ④ **BIOMOTIVE** aims to demonstrate the production of innovative and advanced bio-based materials for utilization in the automotive industry. Its demo plant will create new jobs while paving the way for additional investments in the biobased economy in Eastern European countries.
- ④ **REFUCOAT** is aiming to develop fully recyclable food packaging with enhanced properties and new functionalities. It will reduce landfill waste, enhance preservation of fresh food produce and improve cost and environmental effectiveness in processing.
- ④ **HYPERBIOCOAT** is examining how existing technology can be used to develop biodegradable, low carbon footprint and healthy packaging derived from food processing by-products. This packaging meets consumer expectations and requirements of the demanding areas of food, cosmetic and medical device packaging.
- ④ **BIOPEN** intends to drive a programme of collaboration and knowledge sharing within the bio-based industry by setting up an open innovation platform addressing strategic cross-cutting challenges. This will bring together expertise and promote involvement of industry, researchers and academia at European and national level.



40%
of beneficiaries
are **SMEs**



8
Polish regions
signed a **Letter of Intent** with
BBI JU to enhance
the country's
bioeconomy



55%
of projects involved
in **demo-scale**
production

*Source: EC Bioeconomy Knowledge Center (2015); European Commission DG Agriculture and Rural Development, Farm Economics Unit (2018)



► More information about
BBI JU projects in Poland



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Portugal

Portugal



Portugal's bioeconomy plays an important role in "The National Ocean Strategy" (2013–20) and the "Agri-food & Forestry R&I Strategy" (2014–20), published by the Portuguese Ministry of Agriculture and the Sea. Interministerial measures such as the "Action Plan on Circular Economy" (2017–2020) and the "National Plan for the Promotion of Biorefineries" (2017–2030) also demonstrate the relevance of bioeconomy in Portugal. The country's bioeconomy has an annual turnover of approx. EUR 40 000 million and employs more than 625 000 people.*



Portugal has set course for the future with nearly 80% of the beneficiaries being involved in R&I projects in the bioeconomy sector in areas such as bio-based animal feed, bioplastics and food supplements for humans. Nearly 75% of BBI JU funding in Portugal goes to SMEs.

Examples of BBI JU projects with Portuguese beneficiaries :

- ④ **BIOBRIDGES** aims to increase consumers' and brand owners' confidence and trust while raising awareness to boost the marketability of bio-based products. It will establish close cooperation and partnership between bio-based industries, brand owners, consumers, local communities and authorities.
- ④ **FUNGUSCHAIN** extracts value from the agricultural waste of commercial mushroom farming and produces a spectrum of bio-based products, notably food supplements for the elderly and plastic products. It uses environmentally friendly techniques that SMEs and local industries can adopt thus stimulating local entrepreneurship and developing rural areas.
- ④ **MAGNIFICENT** seeks to develop a sustainable and economically feasible new value chain for food, aquafeed and cosmetic ingredients based on microalgae. It will create new skilled jobs in algae farming and processing by installing large-scale cultivation systems in underdeveloped areas unsuitable for agriculture.
- ④ **PROVIDES** will develop a new, sustainable and techno-economically feasible pulping technology for wood and agro-based lignocelluloses allowing to dissolve them at low temperature and thus helping the European Pulp and Paper industry to achieve the low-carbon bioeconomy.



3/4
of BBI JU funding
goes to **SMEs**



Nearly
80%
of projects
focus on **R&I**



14
beneficiaries are
research centers

*Source: EC Bioeconomy Knowledge Center (2015)



► More information about
BBI JU projects in Portugal



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Romania
România



Romania participates in BIOEAST, a macro-regional bioeconomy initiative being developed by Central and Eastern European countries. The country's activities in the bioeconomy have a total turnover of nearly EUR 37 000 million. With one of the largest agricultural sectors in Europe, Romania offers enormous potential for the valorisation of agricultural sidestreams and an opportunity for the primary sector to benefit from the bioeconomy.*



A first-of-its-kind flagship biorefinery financed by BBI JU will create new skilled jobs in the Romanian bio-based sector.

Examples of BBI JU projects with Romanian beneficiaries :

- 🔍 **LIGNOFLAG** will create an integrated biorefinery that will transform agricultural residues provided by local farmers into liquid transportation fuel, heating power and fertilizer. The plant will generate green jobs and economic growth in rural areas without using agricultural land for production.
- 🔍 **EXCornsEED** will develop an innovative, environmental-friendly approach for extracting and using the proteins and bioactive compounds from bioethanol and biodiesel refinery sidestreams and turn them into high-value commercial products therefore contributing to green and sustainable economic growth.
- 🔍 By using non-GMO European-grown lupin beans to produce high value-added food, animal feed and bio-energy products as well as a number of consumer products, **LIBBIO** will support and enhance the European bioeconomy and reduce dependency on lupin import.
- 🔍 **NeoCel** will develop innovative processes for producing high quality textiles from cellulose pulps. It will reduce the environmental impact and occupational health issues related to man-made cellulose fibre production and promote sustainable, good quality cellulosic fibres for the textile and fashion industries.



60%
of beneficiaries
are **SMEs**



1
of-its-kind **flagship biorefinery**
transforming
agricultural
residues into
liquid biofuel and
heating power



80%
of projects
concentrate
on **R&I**

*Source: EC Bioeconomy Knowledge Center (2015)



▶ More information about
BBI JU projects in Romania



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Serbia
Србија



The bioeconomy in Serbia mainly revolves around a National Action Plan for Renewable Energy Sources (RES), in which biomass corresponds to about 60% of the total production potential. The country is part of several EU-funded projects (such as FP7 and H2020) aiming at the sustainable development of non-food biomass feedstock and the improvement of the food sector through technological advancements.



With one of the beneficiaries being involved in R&I projects and one operating on demo-scale, Serbia's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as bio-based hygiene and health care products, as well as protein production.

Examples of BBI JU projects with Serbian beneficiaries :

- ④ **POLYBIOSKIN** seeks to broaden the use of biopolymers in skin-contact applications such as nappies, beauty masks and wound dressing. The products, derived from biomass and food waste, provide a more environmentally friendly end of life given their biodegradability, allowing organic recycling.
- ④ **GreenProtein** aims at a major innovation in the fields of protein production and food loss reduction in the EU by producing high-added value, food-grade functional proteins and other ingredients, out of green field waste. It will demonstrate the technical and economic feasibility of the revalorisation of green residues from existing agroindustry.



1
SME involved
in **demo-scale**
activities within
BBI JU projects



100%
of BBI JU
funding goes to
academia



1
project focusing
on personal care
products from
biomass and
waste

*Source: Bioenergy & Bioeconomy, Status and Perspectives Workshop (2015)



► More information about
BBI JU projects in Serbia



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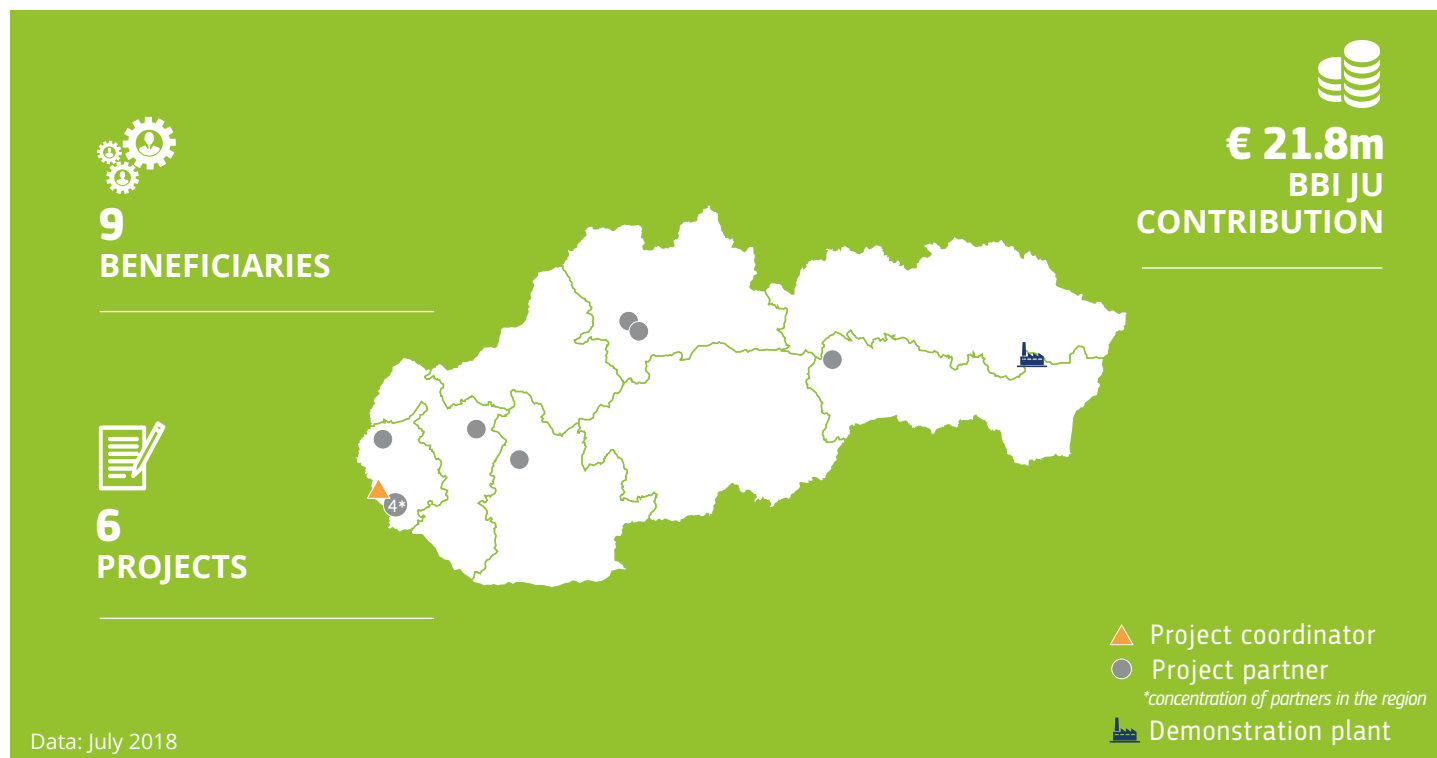
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SLOVAKIA
Slovensko



Slovakia participates in BIOEAST, a macro-regional bioeconomy initiative being developed by Central and Eastern European countries. Kosice with its strong steel, automotive, IT, chemical, agrifood, and plastics industry was selected by the European Commission in December 2015 as one of 6 'model demonstrator regions' to lead the way towards a sustainable chemical production in Europe. The country's activities in the bioeconomy have a total turnover of EUR 11 430 million and employ more than 174 000 people.*



With nearly 30% of the beneficiaries being involved in R&I activities and 54% operating on demo and flagship scale, Slovakia's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as biofuels and biochemicals. One first-of-its-kind second generation biorefinery funded by BBI JU aims to produce and deliver bio-based ethanol for application in the chemical and energy market.

Examples of BBI JU projects with Slovakian beneficiaries :

- ④ **BIOSKOH** will improve bioethanol yields using easily copied technology at low capital costs. By valorising cellulosic fractions of dedicated crops grown on marginal land, it will regenerate rural areas, bring jobs & investment from industry and support the local economy.
- ④ **EXCornsEED** will develop an innovative, environmental-friendly approach for extracting and using the proteins and bioactive compounds from bioethanol and biodiesel refinery sidestreams and turn them into high-value commercial products therefore contributing to green and sustainable economic growth.
- ④ **BIOWAYS** aims to develop educational materials on the benefits of the bioeconomy and to increase awareness amongst Europe's general public, students, scientists, media and policy makers of the value of bio-based products and applications to industry, the economy and the whole of the wider society, both in terms of what they deliver now and in terms of their future potential.
- ④ **Dendromass4Europe** aims to establish sustainable and regional cropping systems for agricultural dendromass production on marginal land. The dendromass produced will be supplied to bio-based value chains which will create additional job opportunities in rural areas.

*Source: Bioeconomy Knowledge Center (2015); Bio-based Industries Consortium (2017)



100%
of beneficiaries
are **research
centers**



More than
1/2
of beneficiaries
are involved in
establishing **demo-
scale and flagship**
production facilities



33%
of BBI JU funding
goes to **SMEs**



► [More information about
BBI JU projects in Slovakia](#)



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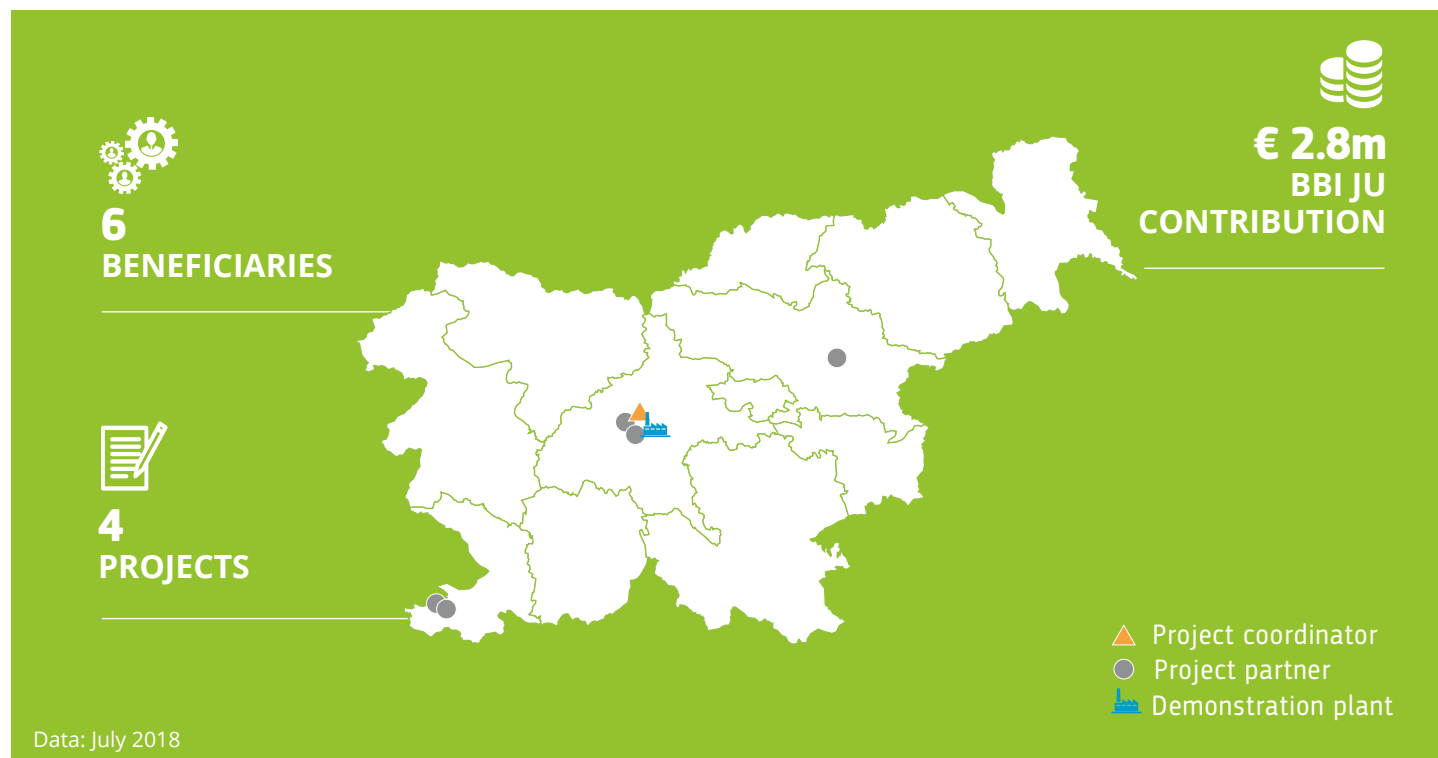
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SLOVENIA

Slovenija

Slovenia participates in BIOEAST, a macro-regional bioeconomy initiative being developed by Central and Eastern European countries. Bioeconomy also plays a role in different national strategies such as "Slovenia's Smart Specialisation Strategy" (2015) and the "Strategy for exploiting biomass from agriculture and health care for energy purposes" (2015). The country's activities in the bioeconomy have a total turnover of EUR 5 998 million and employ more than 101 320 people.*



With more than 30% of the beneficiaries being involved in R&I projects and nearly 70% operating on demo-scale, Slovenia's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as bio-based chemicals and bioplastics for use in food ingredients, cosmetics and adhesives and films. One first-of-its-kind demo production facility develops bio-based polyamides and polyesters.

Examples of BBI JU projects with Slovenian beneficiaries :

- ④ **Pro-Enrich** aims to develop a biorefinery approach able to process a wide range of agricultural residues, making it possible for the first time to evaluate multiple feedstocks in a single bio-refining system. It will identify high quantities of high-purity functional proteins and bioactive components for use in food ingredients, pet food, cosmetics and adhesives.
- ④ **EFFECTIVE** aims to demonstrate first-of-its-kind and economically viable routes for the production of bio-based polyamides and polyesters from sustainable renewable feedstock towards the obtaining of fibres and films with enhanced properties, market competitiveness and increased sustainability.
- ④ **SUSFERT**'s aim is to produce sustainable multifunctional fertiliser using a specifically developed demonstration plant. It will reduce soil and water contamination, supply European farmers with innovative, more sustainable fertilisers and strengthen rural communities by creating new jobs.



Nearly
70%
of projects involved
in **demo-scale
production**



1
first-of-its-kind **demo
production facility**
funded by BBI JU
is developing bio-
based polyamides
and polyesters



1/3
of beneficiaries
are **SMEs**

*Source: Bioeconomy Knowledge Center (2015)



► [More information about
BBI JU projects in Slovenia](#)



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SPAIN
España



Spain published its national Bioeconomy Strategy in 2016 and since then, three annual action plans on a yearly basis with the aim to transform the Spanish economy into a more sustainable one. Spanish bioeconomy has an annual turnover of approx. EUR 198 500 million and employs nearly 1 339 000 people.*



With more than 65% of the beneficiaries being involved in projects focusing on R&I and 30% in projects operating on demo-scale, Spain's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as agriculture, food products, bio-based chemicals and bioplastics.

Examples of BBI JU projects with Spanish beneficiaries :

- By developing two pilot plants in Italy and Spain to demonstrate the feasibility of extracting high-value compounds from agricultural and food processing waste, **AgriMax** will add value to the rural economy, stimulate the creation of new skilled jobs, protect the environment and create new market opportunities.
- EnzOx2** aims to develop new bio-chemical technologies based on the use of oxidative enzymes that will offer the opportunity to overcome bottlenecks in areas with massive potential: biomass-based chemical building blocks, flavour and fragrance ingredients and active pharmaceutical ingredients.
- By developing novel bioplastic materials derived from food waste and agricultural by-products for use in manufactured 3D Printing parts and tools for the building and automotive sectors, **BARBARA** contributes to the development of an innovative, environment-friendly and forward-looking modern industry.
- By validating and up-scaling an environment-friendly and low-cost production process to produce and extract high value-added compounds from algae for use in food, feed and cosmetic products, **BIOSEA** will reduce Europe's dependency on feedstock imports, diminish the pressure on land resources and open new markets and business opportunities.
- The aim of **ICT-BIOCHAIN** is to identify effective ways to use ICT in order to increase the efficiency of biomass supply chains for the bio-based industry. The use of technology will support the development of the EU bioeconomy by facilitating greater availability of competitively priced and sustainable biomass.



2/3
of beneficiaries
are research
centers



47%
of BBI JU funding
goes to SMEs



Nearly
1.3 million
people employed
in the bioeconomy
sector

*Source: EC Bioeconomy Knowledge Center (2015); German Bioeconomy Council (2015); Comunidad de Bioeconomía (2016)



► More information about
BBI JU projects in Spain



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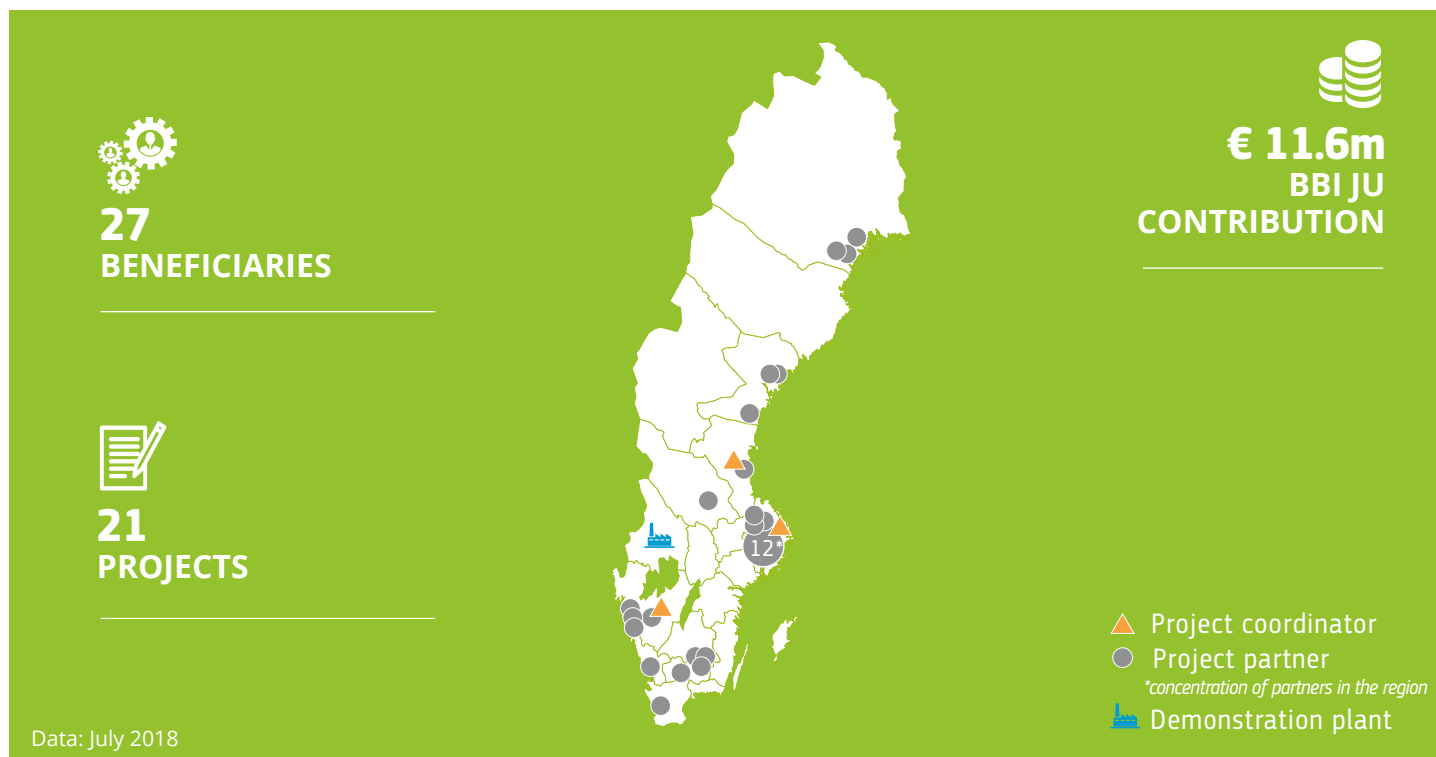
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SWEDEN
Sverige



Sweden's government, in collaboration with the Swedish Research Science Council for Environment, Agriculture and Spatial Planning (Formas), the Swedish Energy Agency and Sweden's Innovation Agency (Vinnova), published its national bioeconomy strategy, the "Swedish Research and Innovation Strategy for a Biobased Economy", in 2012. The country's activities in the bioeconomy have a total turnover of EUR 61 242 million and employ nearly 240 500 people.*



With more than 70% of the beneficiaries being involved in R&I projects and more than 20% operating on demo-scale, Sweden's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as bio-based construction material and food packaging. One first-of-its-kind demo production facility develops cellulose-based packaging solutions for the specific demands of the food and electronic packaging industries.

Examples of BBI JU projects with Swedish beneficiaries :

- 🔍 **GreenLight** utilizes lignin, a wood component that is a large by-product from pulp mills, as raw material for green and cost-efficient carbon fibres. Producing in Europe with European raw materials, the project aims to create new business opportunities and jobs and to increase the competitiveness of the European forest-based industry.
- 🏭 **NeoCel** will develop innovative processes for producing high quality textiles from cellulose pulps. It will reduce the environmental impact and occupational health issues related to man-made cellulose fibre production and promote sustainable, good quality cellulosic fibres for the textile and fashion industries.
- 📦 **PULPACKTION** will develop cellulose-based packaging solutions for the specific demands of the food and electronic packaging industries. It will reduce dependence on non-renewable fossil fuel-based plastics and deliver a safe 100% bio-based and biodegradable product.
- 🌿 **Exilva** is extracting value from forestry sidestreams and creating Microfibrillated cellulose (MFC), a high value product with a low CO2 footprint and multiple uses in a range of business and consumer products.



More than
70%
of projects
concentrate
on **R&I**



1
first-of-its-kind **demo**
production facility
develops cellulose-
based packaging
solutions for the
food and electronic
packaging industries



61.2 million
annual turnover in the
bioeconomy sector

*Source: Bioeconomy Knowledge Center (2015); German Bioeconomy Council (2015)



► More information about
BBI JU projects in Sweden



www.bbi-europe.eu



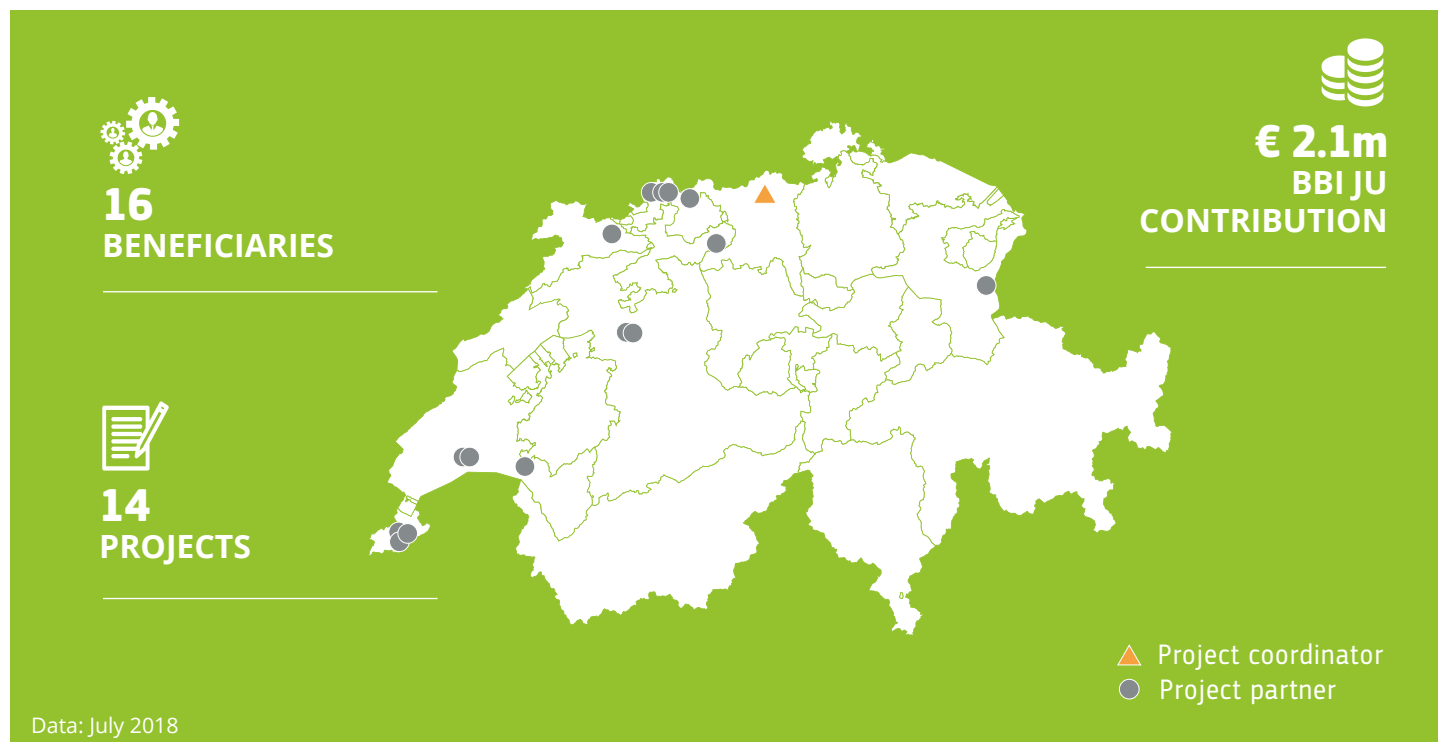
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Switzerland
Schweiz - Suisse - Svizzera



Through the Green Economy Action Plan, Switzerland has recognised the potential of the bioeconomy and paved the way for its development, especially in the sector of energy production. Furthermore, the country now implements strategies for bioenergy research and food research, and hosts a Consortium for Industrial Biocatalysis (SIBC).



With more than 4/5 of the projects in the Research and Innovation sector, Switzerland is focusing on knowledge development and building a bioeconomy hub in the sectors of food, feed, cosmetics and textiles.

Examples of BBI JU projects with Swiss beneficiaries :

- ④ **Prolific** aims to recover significant amounts of proteins/peptides, fibres and other value-added compounds by applying a range of technological processes to agro-industrial residues such as legumes, fungi and coffee. The project will contribute to meet the increasing demand for bio-based molecules and polymers to be used for polymer formulations and applications in the food, feed, packaging and cosmetic sectors.
- ④ **NeoCel** will develop innovative processes for producing high quality textiles from cellulose pulps. It will reduce the environmental impact and occupational health issues related to man-made cellulose fibre production and promote sustainable, good quality cellulosic fibres for the textile and fashion industries.
- ④ **EnzOx2** aims to develop new bio-chemical technologies based on the use of oxidative enzymes that will offer the opportunity to overcome bottlenecks in areas with massive potential: biomass-based chemical building blocks, flavour and fragrance ingredients and active pharmaceutical ingredients.
- ④ **NEWPACK** aims to develop a competitive, sustainable and innovative technology for making novel biodegradable plastic food packaging from food waste. It will reduce single-use plastics and the environmental footprint of packaging materials in a circular economy approach.



80%
of projects
focus on **R&I**



1
coordinator
in a **R&I** project



More than
1/3
of beneficiaries
are **SMEs**

*Source: EC Bioeconomy Knowledge Center (2015)



► More information about
BBI JU projects in Switzerland



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Turkey
Türkiye



With more than half of its land area used for agriculture or covered by forest, Turkey has the potential to make significant contributions to the development of the bioeconomy. The country has published a Strategic Plan 2015-2019 in which biomass plays an important role, and is currently developing a national bioeconomy strategy.



BBI JU activities in Turkey in the bioeconomy sector mainly revolve around technology innovation in areas such as bio-based textiles, food, feed and cleaning as well as cosmetic products. Through its participation in BBI JU projects, the country is specialising in aquatic, woody and organic waste feedstocks.

Examples of BBI JU projects with Turkish beneficiaries :

- ④ **BIOSEA** will reduce Europe's dependency on feedstock imports, diminish the pressure on land resources and open new markets and business opportunities by validating and up-scaling an environment-friendly and low-cost production process to produce and extract high value-added compounds from algae for use in food, feed and cosmetic products.
- ④ **NeoCel** will develop innovative processes for producing high quality textiles from cellulose pulps. It will reduce the environmental impact and occupational health issues related to man-made cellulose fibre production and promote sustainable, good quality cellulosic fibres for the textile and fashion industries.
- ④ **PERCAL** will exploit Municipal Solid Waste (MSW) as feedstock to develop intermediate chemical products at high yield and low impurity level with huge industrial interest. The project aims to produce eco-friendly compounds which can be used for example in cleaning products, in ink and for hot-melt adhesives for cardboard.



100%

of the beneficiaries are involved in R&I activities within BBI JU projects



3

beneficiaries are "private-for-profit" entities



2

national bioeconomy-related strategies

*Sources: Bioenergy & Bioeconomy, Status and Perspectives Workshop (2015), Turkish Ministry of Energy and Natural resources - 2015-2019 Strategic Plan



► More information about
BBI JU projects in Turkey



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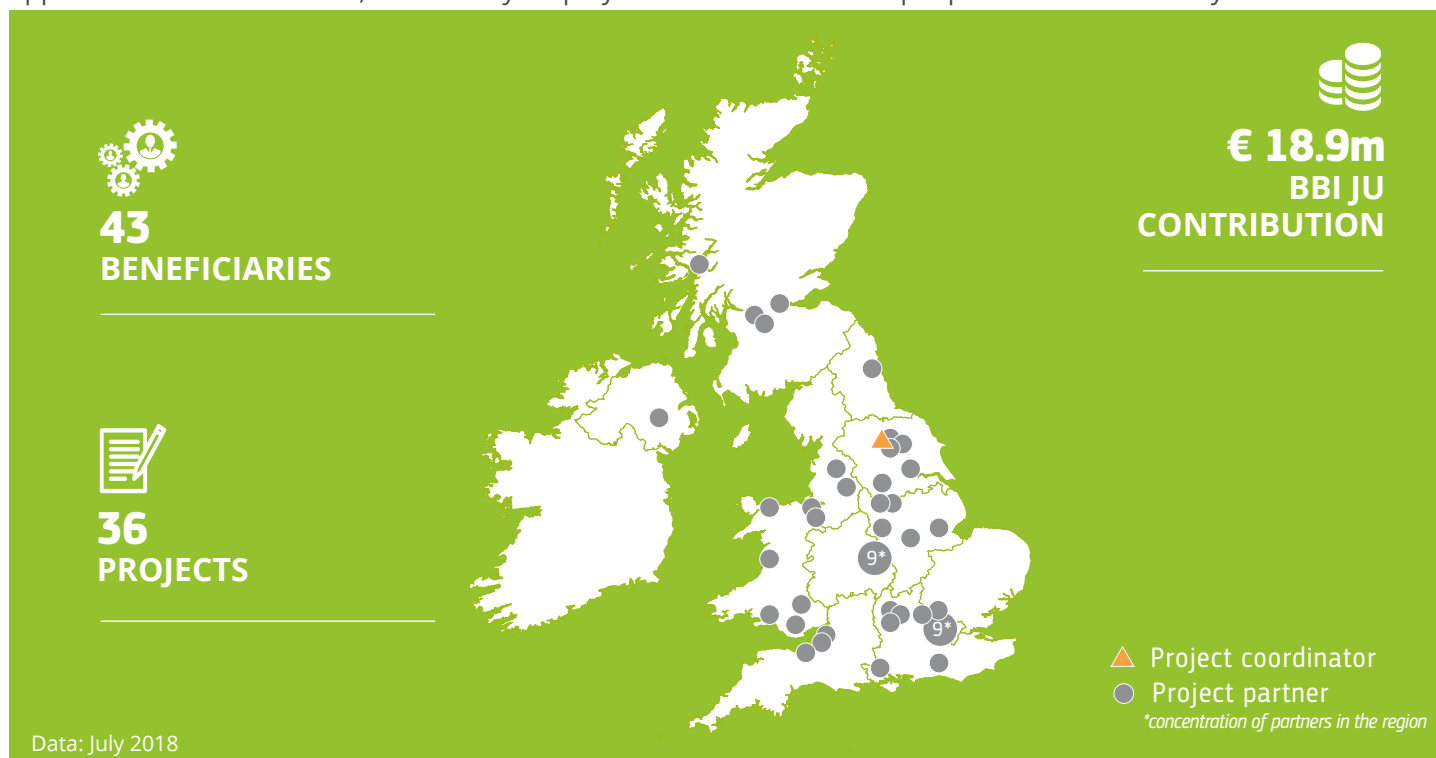


UNITED KINGDOM

United Kingdom



In the UK, a dedicated Bioeconomy Strategy at national level is under development. The initiative is jointly led by government and industry. Other key strategies related to the bioeconomy include the "Industrial Strategy" (2017), which is the UK's overarching strategy for economic growth and productivity, and the "Clean Growth Strategy" (2017), which sets out how the country will meet their long term carbon reduction targets. With an annual turnover of approx. EUR 227 925 million, the country employs more than 1 002 500 people in the bioeconomy.*



With 55% of the beneficiaries being involved in R&I projects and nearly 30% operating on demo-scale, the UK's BBI JU activities in the bioeconomy sector revolve mainly around innovation and demonstration of technologies and products in areas such as bio-based chemicals and bioplastics.

Examples of BBI JU projects with British beneficiaries :

- 🔍 **ReSolve** sets out to replace hazardous solvents with safer alternatives derived from non-food carbohydrates. These new solvents will have a wide range of applications and will improve public health and safety by reducing the use of the toxic and environmentally damaging substances.
- 🔍 **FRESH** develops an innovative, cellulose-based alternative to existing fossil-based plastic trays. The outcome of this demonstration project will be a fully bio-based and biodegradable composite material bringing important benefits for citizens and environment alike.
- 🔍 **POLYBIOSKIN** seeks to broaden the use of biopolymers in skin-contact applications such as nappies, beauty masks and wound dressing. The products, derived from biomass and food waste, provide a more environmentally friendly end of life given their biodegradability, allowing organic recycling.
- 🔍 **ZELCOR** will demonstrate the feasibility of transforming lignocellulose side streams into high added-value bio-based products. It combines chemical and enzymatic catalysis with insects-based biological conversion thus reducing waste and improving the resource efficiency and environmental footprint of the whole sector.

*Source: Bioeconomy Knowledge Center (2015)



50%
of BBI JU funding
goes to **SMEs**



Nearly
70%
of beneficiaries are
research centers



More than
1 million
people
employed in the
**bioeconomy
sector**



► [More information about
BBI JU projects in United Kingdom](#)



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