



# EU earmarks billions for bioeconomy

**HORIZON EUROPE** Defeating cancer, stopping global warming and halting infectious diseases – those are among the ambitious goals of the €95.5bn Horizon Europe innovation programme approved by the European Council in early May. The means to these ends include new public-private partnerships for life sciences and biotech companies. A €10bn EIB financing tool is additionally available to drive the biologisation of industry through the circular economy and bioeconomy.

It's the EU's cornerstone funding programme for research and innovation, and a sizeable chunk of Horizon Europe's budget of €95.5bn will be funnelled into achieving the Sustainable Development Goals (SDGs). After a lot of debate, the European Council has now adopted legislation aimed at complementing the legal framework around Horizon Europe (2021-2027). The EU Parliament approved the programme at the end of April, and it's good news for translational medicine. About €8.3bn are to be channelled into research and development in the "Health" cluster, which includes the fight against antimicrobial resistance, neglected diseases and cancer (see p. 62). Another €9bn is earmarked for "Food, Bioeconomy, Natural Resources, Agriculture & Environment", which will involve bio-based and industrial biotech solutions.

The Commission originally proposed €100bn to achieve the programme's politically ambitious goals, while the European Parliament wanted €120bn. Member states, however, wanted to pay much less. In the end, the EP managed to top-up the budget and agreed with the Commission and the Council on €95.5bn, to include €5.4bn from the Next Generation EU COVID-19 recovery fund. "The glass is half full and half empty," MEP and Horizon Europe rapporteur Christian Ehler said in April. "During this legislative term, we have to see how we're going to

find more funds." Despite that worry, Ehler called Horizon Europe "the most important civilian research programme in the world."

However, criticism has arisen that associated countries like Switzerland and the UK won't initially have full access to Horizon Europe (see p. 38). "An overly protective 'EU-first' approach could hamper groundbreaking research and innovation, which is indispensable for improving the daily well-being of European citizens," according to Kurt Deketelaere, Secretary-General of the university network LERU. In a joint statement, the European network stressed its concerns "about proposals to restrict the UK, Switzerland and potentially other countries' access to certain parts of the programme."

## A boost for the bioeconomy

Horizon Europe is meant to tackle climate change and help achieve the SDGs, but also to boost the EU's competitiveness and growth. That's a red rag for NGOs that have taken up the cause of environmental protection through zero growth. In the Commission's view, nine public-private partnerships (PPPs), which it has renamed 'European Partnerships', should provide the decisive impetus for the implementation of political goals. Initially, the Commission has reserved around €10bn for them.

Most of the new PPPs have predecessors in Horizon 2020. The cornerstone programme for the transformation to a more sustainable and competitive economy is the Circular Bio-based Europe partnership (CBE). "This partnership contributes significantly to the 2030 climate targets, paving the way for climate neutrality by 2050, and increases the sustainability and circularity of production and consumption systems in line with the European Green Deal," says the EC's draft. The biotech sector is well-placed to drive quite a few of the fundamental transformations envisaged in that Green Deal. The EC is funding CBE with about €1bn, which the partners "will match with at least an equivalent amount of investment." The proposal for regulation, the Single Basic Act (SBA), still needs to be adopted by the European Parliament and the European Council. Although the industry partners within the previous Bio-Based Industries Joint Undertaking (BBI JU) have praised the collaboration between the public sector and the private sector as a success story, at first glance they now seem to have reduced their own contributions from €2.7bn to €1bn.

To understand why, it's worth a look back at the last seven years. BBI JU was established in 2014. The joint industry partners in the Bio-based Industries Consortium (BIC) contributed €2.7bn to

the programme's budget, the EC €1bn. Its main purpose has been to transform renewable biological feedstocks into bio-based chemicals, materials, products and energy, replacing their fossil-based versions. "Accounting for 3.6 million jobs and around €700bn turnover in the EU, this sector is key for the green economy. It plays an essential role in reducing Europe's dependency on strategic raw material imports, spurring sustainable growth and boosting Europe's competitiveness by contributing to the revitalisation of rural and coastal areas," says the BBI JU webpage. The projects have three main areas of focus:

- Feedstocks (fostering a sustainable biomass supply in Europe that doesn't compete with food production, and creating new supply chains),
- Biorefineries (optimising efficient processing through R&D and demonstrating the model's economic viability at a large scale in demonstration actions and flagship biorefineries)
- Markets, products and policies (developing markets for bio-based products and optimising policy frameworks to ease their market uptake).

The BBI JU claims Europe's bio-based industries sector could replace 25% of all oil-based chemicals by 2030, drastically reduce EU dependency on the import of important raw materials like protein (by 50%), phosphorus and potassium (by 25%), cut greenhouse gas emissions by 50%, and create up to 700,000 green jobs by 2030, especially in rural and coastal areas, as compared to 2014 figures. The joint undertaking recently signed grant agreements with 18 new projects. 199 beneficiaries from 26 countries across the EU and beyond will receive financial support worth €104.5m, BBI JU announced. It was the last call that will bring the initiative's total investment to €821.6m and the portfolio to 142 projects, which are having an impact. "Already over 80% of BBI JU projects anticipate lower greenhouse gas emissions compared to fossil-based counterparts, while a vast majority of them contribute to waste reduction and valorisation, reuse and recycling," wrote its Executive Director Philippe Mengal last year. "BBI JU projects are reducing energy consumption, improving land use and water efficiency, as well as developing more sustainable use of natural

and existing unused resources. In practical terms, the total CO<sub>2</sub> savings of the first nine BBI JU flagship biorefineries are expected to reach 600 kT per year." Dirk Carrez, Executive Director of the Biobased Industries Consortium (BIC), which represents around 240 industry members and 200 associate members, told EUROPEAN BIOTECHNOLOGY that "the BBI JU is a success, and the positive impact can be clearly demonstrated. BBI JU's proven impact was one argument to propose the CBE."

### Some wiggle room left in budget

So how does the supposed cut in the industry contribution from €2.7bn to €1bn come about? "At the time the SBA was proposed, the Horizon Europe budget was not agreed, so only indicative figures could be included in the SBA," explains Carrez. "Hence, the current text for all JUs indicates the term 'at least' when referring to funding. BIC as the private partner in the proposed CBE remains committed to making a substantial contribution, and in line with the adopted SBA," he adds. "The fact that the industry officially 'co-invests' less is

## Horizon Europe Health Cluster

**Global Health EDCTP3:** This partnership is to deliver new solutions for reducing the burden of infectious diseases in sub-Saharan Africa, and strengthen research capacities to prepare and respond to reemerging infectious diseases in sub-Saharan Africa and across the world. By 2030, it aims to develop and deploy at least two new technologies tackling infectious diseases, and support at least 100 research institutes in 30 countries to develop additional health technologies against re-emerging epidemics. The EU is funding the partnership with up to €800m with matching funding of the partners. The partnership is the successor of EDCTP2.

**Innovative Health Initiative:** This initiative is to help create an EU-wide

health research and innovation ecosystem that facilitates the translation of scientific knowledge into tangible innovations. It is to cover prevention, diagnostics, treatment and disease management. The initiative is to contribute to reaching the objectives of Europe's €4bn Beating Cancer Plan, the new Industrial Strategy for Europe and the Pharmaceutical Strategy for Europe. The EU is funding the partnership with up to €1.2bn with matching funding of the partners. The partnership is the successor of IMI2.

Besides the institutionalised partnerships there are further initiatives serving the "Health" Cluster. The European Partnership for One Health/AMR Antimicrobial Resistance (AMR) aims to coordinate and align activities and fund-

ing between countries as well as with the Commission. The main goal is to contribute to achieving the objectives of the European One Health Action Plan against AMR and the WHO Global Action Plan on AMR, by reducing the threat of AMR. The European Partnership on Rare Diseases will coordinate national, local and European research and innovation programmes, combining research funding and implementation of research supportive activities such as training, data access infrastructures and data standards. The main goal is to improve the life of patients with rare diseases by developing diagnostics and treatments for rare diseases through multidisciplinary research. ■



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due to agreed limitations on what will be 'registered' as co-investment by industry (a stricter definition, as described in the SBA)."

However, the BBI JU has opponents as well as friends. One is the non-profit Corporate Europe Observatory (CEO), which is close to and financed by GMO-sceptic environmentalists and fundamental industry critics. It has criticised the industry's commitment as too low. CEO says the recent proposal mirrors findings the organisation published last year in a report that claimed industry was paying very little of what it had committed to. "The latest figures available (from the end of 2018 at that time) showed that while the European Commission had already paid 27% of their pledged cash contributions, industry partners had so far only paid 3% of theirs, as well as 3.7% of their auditable in-kind contributions," CEO announced last month. "Recently disclosed figures for the BBI's 2019 budget do not tell a very different story." The organisation claimed further that in addition, "industry partners have opposed transparency on how to value their in-kind contributions." The organisation also questioned some basic premises: "Increasing biomass extraction without imposing reductions in the use of fossil fuels combines the worst of both worlds: eliminating existing carbon sinks while emitting even more CO<sub>2</sub> ... the production of biomass in Europe has been plateauing over the past 15 years, and most of the current production is achieved through unsustainable farming and forestry practices," the CEO report concludes.

BIC rejected those claims as unfounded and erroneous. "As is the case of other Joint Undertakings, the private partner contribution is mainly in-kind contributions, operational costs, as well as additional activities, e.g. investments in infrastructure for demonstration and flagship projects", the BIC, BBI JU and the EC said in a joint statement. "IKOP (*in-kind contributions for funded projects*) in grant agreements signed by 31/12/2019 is above €203m, much higher than what is mentioned in the report. The Auditors selected to certify IKOP are indeed chosen by the companies, but among the 'certified auditors' used to certify all costs incurred by Horizon 2020 beneficiaries. The IKOP certification process is in fact the same for the rest of the Horizon 2020 programmes and provides the correct level of assurance. A very similar auditing process is in place for ICAA (*in-kind contributions in additional activities*), for which the contribution from BIC reached already €700m," the partners rectified.

CEO also appears to use out-of-date figures on feedstocks. According to the JU, the "BBI JU has included in its SIRA (*The Strategic Innovation and Research Agenda*) a specific limitation of only using biomass feedstocks of European origin. Many BBI JU projects valorise agricultural biomass, but 92% of them focus on agriculture waste, 7% use dedicated crops – but ones grown on marginal lands – and only one project uses sugars. 96% of the projects employing forest-based feedstocks use wood residues, cellulose, pulp and paper industry side streams. The remaining 4% come from

sustainably managed forests. 100% of aquatic feedstock used in BBI JU projects is algae and fish/seafood by-products." The EU, however, says critical input is welcome on the path to more sustainability. After all, companies face the challenge of reconciling ecology and economy while avoiding greenwashing. More funds are available for this.

### The €10bn initiative

Another €10bn enticement is the Joint Initiative on Circular Economy (JICE). National promotional banks in Poland, France, Italy, Spain, Germany and the European Investment Bank (EIB) want to accelerate the transition to a sustainable and circular economy over five years (2019–2023). In its first year, JICE already provided €2.7bn of long-term financing to support circularity in industrial production. The initiative published supported projects across the value chain of sectors like agriculture, industry and services, mobility, urban development, waste and water management – in fields from circular design to value recovery.

### Paper from grass

One of the beneficiaries is Creapaper, a German start-up for circular paper production and innovative packaging. It produces paper from grass, which not only saves wood as a raw material but also emits significantly less CO<sub>2</sub> and consumes less water. Another is French online marketplace Vestiaire Collective, which allows users to buy and sell second-hand luxury fashion. Romanian-based Winnow develops software and hardware solutions for reducing food waste in professional kitchens. Aquaservice, a Spanish water service provider, reuses and recycles all its material and carries out maintenance with a repair and reconditioning programme. In Florence, a recovery intervention involving existing buildings aims to establish new productive uses and annexed offices. And Star meat, a Polish meat processing manufacturer, is using an innovative process to reduce meat waste. JICE provides loans, equity investment, guarantees and technical assistance.



A further instrument intended to make the EU economy more sustainable is the European Circular Bioeconomy Fund (ECBF) – the continent’s first venture fund with a focus on the bioeconomy and circular bioeconomy. It kicked off operations last October with a financing round for the Dutch PeelPioneers B.V. and the German Prolupin GmbH, and raised €82m in its first closing. In December, the fund announced a second closing with €93m. The ECBF’s main backer is the European Investment Bank (EIB), which has pledged €100m. Also on board are Pre Zero International GmbH, Corbion NV and Hettich Beteiligungen GmbH. In December, food giant Nestlé, Volkswohl-Bund-Versicherungen, the Finnish refinery company Neste and the German development bank NRW-Bank joined.

“A further closing step will take place in May 2021. Two additional corporates and one family office are going to join,” CEO and General Partner Michael Brandkamp told EUROPEAN BIOTECHNOLOGY. Financial details were not disclosed. By August, the fund is expected to reach its target of €250m. “By the end of 2021, we expect to be joined by a number of large companies, family offices and pension funds,” Brandkamp says. “Our goal is to make five investments per year. We already have many exciting deals with high potential in our pipeline that are under assessment, and they’ll be announced in due time.” The ECBF invests primarily in late-stage bioeconomy companies that have excellent potential for innovation and good return prospects. In technical terms, investments are focused on companies or projects with Technology Readiness Levels of 6 to 9 and some first significant commercial traction. The investment size ranges from €5m-€10m. Commitment with Environmental, Social, and Governance (ESG) criteria is a condition for an investment. Contributions to CO<sub>2</sub>-reduction, biodiversity, circularity, and the mitigation of toxic substances are valued. Financing instruments are equity, mezzanine and venture debts.

The latest investment was announced in mid-April, when Belgium-based Apha Bio’s initial €14m Series B round was ex-



panded to €18m. The ECBF also invested on par with Astanor Ventures, with participation from seven existing investors. Apha Bio was founded as a spin-off of Vlaams Instituut voor Biotechnologie (VIB), Ghent University and K.U. Leuven in late 2016. The firm focuses on products that help reduce fertilizer application (biostimulants) and control fungal diseases (biocontrol agents) sustainably in maize and wheat.

### Recycling of orange peels

Since 2017, PeelPioneers B.V. has been processing orange peels that would otherwise have been incinerated into functional ingredients for industry. The ECBF participated in a €10m investment by a consortium that included five further investors. The Dutch company wants to use the capital to build “Europe’s largest peel-processing factory” in Den Bosch, tripling its processing capacity to 120,000 thousand kilos of peels per day. PeelPioneers also plans to expand in Europe with five new peel processing plants in the next five years, the start-up announced. “Our first focus is on the German, Spanish, French and Scandinavian market,” co-founder Bas van Wieringen told EUROPEAN BIOTECHNOLOGY. Its products include dietary fibers that lend substance and structure to meat substitutes, bakery products, and sauces. It also extracts orange oil and other raw materials that manufacturers use in food production or in detergents and cosmetics.

From regionally grown lupin beans, German-based Prolupin GmbH is producing plant-based proteins that are formulated into non-dairy alternatives being marketed under the brand “Made with Luvé”. Lupin beans can be grown on sandy soils

prone to drought. Prolupin says that “compared to the soybean, lupin beans have the advantage of being GMO-free and sensorially neutral in taste.” The company is a 2010 spin-off from the Fraunhofer Institute for Process Engineering and Packaging (IVV). “Prolupin has considered all kinds of financing models and is in regular contact with potential investors, strategic partners, and governmental bodies,” says CFO Christian Frankhänel. “With ECBF we found a partner with strong expertise and a broad network in bioeconomy. ECBF is also strongly committed to ESG standards. All those characteristics fit very well with Prolupin’s mission.”

Altogether, the ECBF has invested €10m in its portfolio companies. According to the fund, consumer demand for more sustainable products – along with political and regulatory frameworks fostering innovation and decarbonized markets, e.g. through the Green Deal – are the primary drivers of bioeconomy growth. The ECBF has identified at least six further start-ups as investment targets: Protix (The Netherlands), Infinited Fiber (Finland), Paptic (Finland), Tipa (Israel), Biotalyz (Belgium) and Amsilk (Germany), which recently raised €29m in a Series C round.

The ECBF is cooperating with BBI JU. “ECBF offers complementary financial instruments beyond the EU grant scheme, and is committed to assessing BBI JU proposals that meet the ECBF screening requirements to scale them up,” ECBF Relationship Manager Clara Martinez told EUROPEAN BIOTECHNOLOGY. “The CBE JU will take the success of BBI JU to the next level.” ECBF is also focused on expanding its European networks. “We’re connecting with stakeholders actively, working with SME’s and scale-ups such as accelerators, industrial clusters and associations, chambers of commerce, and dedicated bioeconomy networks complementary to BBI JU,” Martinez adds.

Although the debate on funding the new PPPs is still far from over, one thing is certain. Industry, SMEs and academia looking to contribute to the bioeconomy will in the future find many more options to help drive their projects forward. ■

*t.thieme@biocom.eu*