

General Information	
Preliminary title of the European Partnerships	European Partnership for a Circular bio-based Europe: sustainable innovation for new local value from waste and biomass
Short description of the partnership	The partnership supports sustainability-driven innovation for new local value-creation from waste and biomass, driving sustainable and climate-neutral solutions towards a healthier planet, replacing non-renewable fossil and mineral resources by biomass and waste for renewable products and nutrients.
Services directly involved	Lead: DG RTD, DG AGRI; Associated: DG GROW, DG MARE, DG CLIMA, DG ENV
Context and problem definition	<p>In line with the EU's commitments under the Paris agreement, the bio-based sector can drive sustainable, climate-neutral and circular solutions.</p> <p>The bio-based sector can contribute to achieving the goals of the circular economy, for instance through the development of our capacity to turn by-products, residues, discards and wastes into valuable bio-based products. Bio-based solutions offer significant opportunities to recover and recycle nutrients reducing their associated environmental impacts, increase the circularity of agro-food systems, for example, through the valorisation of unavoidable food waste and provide durable carbon sink opportunities. It can support the renewal of the EU's industrial base through biorefinery deployment and help keep sustainable innovation within the EU.</p> <p>The bio-based sector is gaining momentum. The first action of recently updated bioeconomy strategy calls to strengthen and scale up the bio-based sector by a "mobilisation of public and private stakeholders, in research, demonstration and deployment of sustainable, inclusive and circular bio-based solutions".</p> <p>The development of bio-based value chains offers substantial opportunities for regional and rural economic development and improved territorial cohesion, for instance through the deployment of small-scale business models suitable for direct adoption by primary producers, either individually or through cooperative approaches. Small-scale solutions will empower primary producers, allowing them to take the initiative in the generation of value.</p> <p>While the sector can indeed strongly contribute to the EU's agenda for greener and inclusive growth and jobs, there are still major challenges that curb their potential:</p> <p>Technological and innovation challenges relate to the development of reliable and cost-competitive supply chains of sustainable biomass, and of processes for turning biomass into industrial products. This is a major departure from the current highly centralised and linear fossil/mineral based production and thus requires new technological breakthroughs on sustainable biomass provisioning systems and conversion processes, thus advancing technological maturity of the nascent bio-based sector. Technological innovation should go hand in hand with systemic, social and business model innovation to increase and distribute benefits.</p> <p>Market failures are an obstacle to investing in R&amp;I in the sector. They are mainly associated with :</p> <ul style="list-style-type: none"> <li>(i) High risk and large capital expenditure required for demonstration and deployment of large biorefineries. This results in the reluctance of private investors to bear the entire financial burden required to build the first key facilities without public support.</li> </ul>

	<p>(ii) Uncertainty around feedstock availability and costs. Compared to fossil/mineral resources, which have a stable composition, biomass and waste are scattered, variable and seasonal. Furthermore, they are a limited resource with a number of competing uses.</p> <p>(iii) Fragmented policy framework across the EU. The bio-based sector forms part of a wide range of policies at EU, national and regional level (agriculture, waste, industry, fertilisers, chemicals, etc.), leading to a complex and sometimes fragmented policy environment.</p> <p>(iv) Bio-based is multi-sectoral with fragmented value chains and untried or non-existent industrial ecosystems. The development of successful and widely implementable bio-based value chains needs to identify and exploit cross-sectorial synergies to be based on inclusive patterns with all different private and public actors involved: from primary producers to end users and brand owners, and from regional and local authorities to civil society. Embracing this broad range of stakeholders will enable the necessary spill over effect for the whole bio-based sector and will increase the coherence and robustness of its value chains.</p> <p>The proposal will build on the achievements and lessons learned from the Bio-based Industries Joint Technology Initiative under Horizon 2020. The interim evaluation of the BBI JTI confirmed its positive effect in terms of the competitiveness of the bio-based technologies via the initiative's structuring and mobilising effect. It also made recommendations on, inter alia, the need of the initiative to broaden the scope of its activities and strengthen synergies, while enlarging the range of actively involved stakeholders.</p>
Objectives and expected impacts	<p>The objective is to drive sustainable and climate-neutral solutions accelerating the transition to a healthy planet, where non-renewable fossil and mineral resources will be replaced by biomass and waste for the production of renewable products and nutrients. Land-based carbon sinks will be incentivised by the increased valorisation of biomaterials. The initiative will create awareness, capacities and appropriate structures in a systemic approach extending beyond industry partners, also mobilising producers of biological resources and end users.</p> <p>Expected impacts:</p> <ul style="list-style-type: none"> <li>- Scientific: Creating long term S&amp;T basis in the EU by supporting all stages of the innovation cycle: from early research via innovation to unlocking investments and markets, in addition to creating synergies with public funds and other instruments. Keeping innovation in the EU will support the renewal of the EU's industrial base e.g. 300 new biorefineries could be created deployed in the EU by 2030<sup>1</sup>.</li> <li>- Environmental: Reduction of GHG emissions (fossil material substitution, carbon sinks); preserving and restoring ecosystem services and biodiversity; circularity: reducing waste, closed-loop production; reducing nutrient pollution; fostering environmental protection, including water, air and soil. E.g. Implementing of the bioeconomy strategy could save between 1-2.5 billion tonnes of CO<sub>2</sub> equivalent every year by 2030<sup>2</sup>. This is equal to emissions from 490 million cars.</li> <li>- Social: Revenue generation and diversification for primary producers. Additional job and business opportunities in rural areas. Inclusive business</li> </ul>

<sup>1</sup> Current estimates based on OECD, Meeting Policy Challenges for a Sustainable Bioeconomy, 2018, ISBN 9789264292375; BIO-TIC, A roadmap to a thriving industrial biotechnology sector in Europe, 2015.

<sup>2</sup> OECD, (2011), 'Industrial biotechnology and climate change. Opportunities and challenges'; EuropaBio (2018) Industrial biotechnology – Contributing towards achieving the UN global Sustainable Development Goals.

	<p>models. Rural regeneration by reindustrialisation. E.g. One million new jobs could be created in bio-based industries by 2030<sup>3</sup>.</p> <p>- Economic: Security of raw materials supplies by using local resources. productivity and growth; leverage of investments, engagement and commitment of relevant actors. E.g. 45% of the demand of nutrients could be supplied by recovery from waste by 2030<sup>4</sup>.</p>
Necessity test: rationale for a European Partnership	<p>The initiative aims to tackle challenges that go beyond the capacity of a single company, industry sector, Member State or civil society actor. An action at EU level will enable the entire bio-based sector to collectively build on the foundations provided by assets, strengths and skills available at national and regional level.</p> <ul style="list-style-type: none"> <li>▪ Biomass and waste are scattered, variable and seasonal. Therefore they represent a limited resource for both bio-based products and nutrients and have a number of competing uses. An EU rather than local or MS approach will result in a systemic understanding of the resource variability and flows, thus reducing the uncertainty around feedstock availability and costs.</li> <li>▪ The demonstration and deployment of large biorefineries is a high risk and capital intensive exercise that will take advantage from cross-border and cross-sector collaboration and investment at European scale.</li> <li>▪ The bio-based sector forms part of a wide range of policies<sup>5</sup>, already being dealt with at EU level, leading to a complex and sometimes fragmented policy environment. Action at EU level on the bio-based sector will help to rationalise and overcome the fragmented policy framework.</li> <li>▪ The partnership can assist relevant actors (Member States, regional and local authorities, biomass primary producers, the private sector and wider public) to align strategies and visions, and engage in cross-border, cross-sector, interdisciplinary R&amp;I, thus achieving the policy objectives in a more efficient, coherent and impactful way.</li> </ul>
Relevant for the following parts of Horizon Europe	<p>Pillar II 'Global Challenges and European Industrial Competitiveness'</p> <p><input type="checkbox"/> Cluster Health</p> <p><input type="checkbox"/> Cluster Culture, creativity and inclusive society</p> <p><input type="checkbox"/> Cluster Civil Security for Society</p> <p><input checked="" type="checkbox"/> Cluster Digital, Industry and Space</p> <p><input checked="" type="checkbox"/> Cluster Climate, Energy and Mobility</p> <p><input checked="" type="checkbox"/> Cluster Food, Bioeconomy Natural Resources, Agriculture and Environment</p> <p><input type="checkbox"/> Cross-cluster</p> <p><input type="checkbox"/> Pillar III 'Innovative Europe'</p>
Currently identified links with other partnership candidates / Union programmes	<p>Synergies with the Common Agricultural Policy, the EU regional policies and their instruments (e.g. ESIF), the Programme for Environment and Climate Action (LIFE), the Invest EU programme and the Emission Trading Schemes Innovation Fund. Links with possible missions areas (adaptation to climate change; healthy oceans, seas, coastal and inland waters; climate-neutral and smart cities; soil health and food) and the possible successor of SPIRE</p>

<sup>3</sup> The strong and fast-growing startup ecosystem in the biotechnology sector will play a leading role in the realising of this potential. EuropaBio Report, Jobs and growth generated by Industrial biotechnology in Europe, 09.2016

<sup>4</sup> NPK (Nitrogen, phosphorus and potassium) Interreg Project Phos4You and Verstraete, W. et al., 2009 Bioresource Technology Volume 100, Issue 23

<sup>5</sup> e.g. the bioeconomy strategy, the circular economy strategy, the common agricultural policy, the rural development policy, the climate change policy including the Paris agreement, the renewed industrial policy strategy and the UN sustainable development goals

	“Sustainable Process Industry” under Horizon2020; have been preliminarily identified.
Does the proposed partnership build on currently active ones?	BBI JU – running until end of 2024; SPIRE cPPP – running until 2020.
Expected type and composition of partners	<p>Given that the bio-based sector is a truly multi-sectoral segment of the bioeconomy, the partnering approach will need to evolve to become systemic, reaching beyond a one-sided industrial interlocutor.</p> <p>The private partners must have the capacity to represent the bio-based industries as a whole, including forest-based, agriculture, food industry, marine-based, bio-waste processors, textile, cosmetics, construction, chemical or biotechnology. The active engagement of other key actors, such as the producers of biological resources (farmers, land and forest owners, etc.) and end users (brand owners, consumers), is paramount</p> <p>On the public side, there is a need to develop a deep and coherent engagement with Member States across the EU and public authorities at regional and local levels, helping ensure a balanced and active stakeholder participation. This includes funding or implementing bodies responsible for programmes and funds related to research, innovation, deployment and macro-regional, regional and urban initiatives, protection of climate and the environment.</p> <p>Bio-based value chains need to be based on inclusive patterns with different actors participating in the creation of value, maximising positive societal, environmental and climate impact, thus, the need to include also civil society / non-governmental organisations.</p>
Contributions and commitments expected from partners (other than the Union)	Active engagement and commitment of producers of biological resources and end users is a must for this potential partnership. In case of an institutionalised European Partnership an “ex-ante demonstration of the partnership’s long term commitment, including a minimum share of private investment” is expected <sup>6</sup> .
Currently envisaged implementation mode(s).	<input checked="" type="checkbox"/> Co-programmed European Partnership <input type="checkbox"/> Co-funded European Partnership <input checked="" type="checkbox"/> Institutionalised European Partnership <ul style="list-style-type: none"> <li><input type="checkbox"/> Article 185</li> <li><input checked="" type="checkbox"/> Article 187</li> <li><input type="checkbox"/> EIT-KIC</li> </ul>
Justification of the implementation mode	The implementation of the initiative via a European partnership, article 187 or co-programmed, is necessary to enable the different actors of this truly multi-sectoral sector to address its objectives in a more efficient, coherent and impactful way. The chosen implementation mode must favour the openness of the initiative and the coherent engagement with Member States, regional authorities, consumers and civil society. It should also allow for the necessary flexibility in programming and priority setting while leveraging private investment from a broad range of stakeholders.
Proposed starting year	2021

<sup>6</sup> According to the selection criteria for institutionalised partnerships provided for in the proposal for Horizon Europe Framework Programme (annex III)