

General Information	
Preliminary title of the European Partnerships	Circular and Climate Neutral Industry
Short description of the partnership (30 words max)	Transforming European process industries, including materials and recycling sectors, to make them circular, clean and climate neutral by 2050, and to enhance their technological leadership at global level and international competitiveness.
Services directly involved	RTD & GROW (Leads), CLIMA, ENER, ENV
Context and problem definition	<p>Climate change is a source of major concern to Europeans and around the globe. Global warming could undermine the security and prosperity of our societies in the broadest sense, damaging economic, food, water and energy systems, and in turn triggering further conflicts and migratory pressures.</p> <p>Process industries, such as steel, chemicals or cement, are central to virtually all value chains and hold strategic importance with around 80% of their production consumed within the EU; they represent 15 % of the value added of the EU industry and over 6 million jobs. However, these industries are also highly energy and resource intensive and were accountable in 2015 for 15% of all the EU-GHG emissions (665Mt CO₂-eq). They also stand for over 23% of pollutant emissions in general.</p> <p>To achieve the objectives of the Paris Agreement, the EU has presented its Communication ‘A Clean Planet for All’, outlining a vision for the European economy to become climate-neutral by 2050. In order for Europe’s industries to contribute adequately, major break-through technologies will need to be developed in the next decade to a level they can be commercially deployed at scale as of 2030.</p> <p>Linear production and consumption patterns also participate to unnecessary GHG emissions. It has been shown that a more circular economy can make deep cuts to emissions from industry: as much as 296 million tons CO₂-eq per year in the EU by 2050, and some 3.6 billion tonnes per year globally. In the same line, a more circular economy should relieve pressure from economic activities on natural resources (land, water, biodiversity), which has tripled since the 70s; resource extraction and processing of materials, fuels and food is estimated to account for more than 90% of biodiversity loss and water stress.</p> <p>Under Horizon 2020, the contractual Public-Private Partnership “SPIRE” addressed the resource and energy efficiency of process industries with the aim to develop technologies able to reduce European process industries’ emissions by up to 40%, fossil-energy consumption by up to 30%, and non-renewable primary raw material consumption by up to 20%. To date, SPIRE has reported over 220 significant innovations, with the potential of reducing, in average, emissions by 30%, fossil energy consumption by 36%, non-renewable primary material consumption by 25%, waste by 32%, and freshwater consumption by 20% (compared to current practice). SPIRE also already demonstrated a promising leverage, with private R&I investments covering the research roadmap totalling so far €3–4.3 billion (i.e. a 1:7 – 1:10 ratio) under Horizon 2020.</p> <p>New breakthrough technologies have to be assessed for their global environmental impact, such as air and water pollution, through comprehensive life cycle analysis. A circular, clean and climate neutral industry will be key in contributing to the completion to the 2030 Agenda by integrating resource and material efficient practices and reinforcing climate neutral transformations. Building in the implementation of the Circular Economy Action Plan, EU Industries are in the path of achieving these objectives</p>
Objectives and expected impacts	<p><u>Objectives:</u></p> <p>Compared to H2020 SPIRE, the envisaged partnership should therefore enlarge its scope to cover relevant value chains (including eg the circular component of the H2020 raw materials programme) and include new</p>

sectors; it should look beyond programmatic activities and contribute significantly to market deployment.

The latest IPCC Special Report on 1.5°C from October 2018 states that industrial GHG emissions will need to be reduced **globally** by 75–90% in 2050 relative to 2010. Europe’s ambition for industrial sectors should be to aim towards full climate neutrality by 2050.

The partnership should build on a roadmap towards a carbon neutral transformation of energy intensive industries, a significant reduction of energy needs and process emissions, increased recycling rates, which is currently under preparation. This roadmap should support the European long-term strategy.

The specific objectives of the partnership are to:

- Deliver, together with the EU and Member States, on a ‘Long-term EU Strategy for the reduction of GHG emissions’ with a new Research, Innovation and Investment Strategy for climate neutrality.
- To achieve a strong integration between energy and resource intensive EU industries, the raw material suppliers and the recycling industries, and with the energy sector.
- To develop the technologies to make industrial production, products, and services fully compatible with (future) climate targets set for the EU and at global level by 2050, as well as with the relevant circular economy objectives of the EU, while being at the forefront to continuously progress on the overall reduction of pollution by industrial emissions. In particular:
 - A number of disruptive technologies (e.g. electrification of industrial processes relevant also for cluster “Climate, Energy and Mobility”, higher energy and resources efficiency and flexibility, capturing and using CO₂ and CO to produce climate neutral materials and fuels, changing the energy mix, transversal digitalisation of all industries concerned) will need to be demonstrated by 2030, through large first-of-a-kind demonstrators, followed by wide-scale market deployment by 2040.
 - By 2030, breakthrough and disruptive technologies will also need to be developed and validated to support a high degree of resource efficiency through circularity and a fully climate neutral and clean EU industry by 2050

The success of this partnership may be measured by several indicators: overall increase of private R&I expenditures in areas covered by the partnership, number of innovations, number of projects developed further (eg through the innovation fund, Invest EU, public or private investments such as IPCEIs, etc)

Impact:

The partnership will contribute to EU global leadership in industrial climate neutral, resource efficient and circular technologies, demonstrating technological competitiveness, for other regions to follow, and de-risking the long-term commitments, across all sectors,.

Efforts to tackle climate change, inefficient use of resources, and pollution would trigger fundamental industrial transformation and modernisation activities in all sectors of the European economy and could furthermore provide first mover competitive advantages create added-value jobs and open up opportunities to European exporters in growing clean technology markets.

Such a partnership will not be limited to developing new technologies; it aims to offer contributions to future policies to continue with the transition towards a circular economy and to achieve climate targets developed and adopted at EU level.

<p>Necessity test: rationale for a European Partnership</p>	<p>A European Partnership is best fitted for the large cross-sectoral approach that is necessary to achieve the objective of circular and climate neutral industries. It would be one of the main R&I instruments to implement an EU industrial strategy for climate neutrality by 2050. As a flagship initiative, it will pave the way, worldwide, to investments in circular, clean climate neutral industries.</p> <p>A partnership is needed to ensure a systemic, cross-sectoral analysis of the R&I needs (strategic research roadmaps), but also to have a central role with regard to exploitation and market deployment through support to dissemination and technology transfer, industrial standards roadmaps, skills and educational curricula, etc. It is also necessary to provide policy and legislative analysis and recommendations to facilitate and accelerate market uptake, for instance on infrastructure needs.</p> <p>A European Partnership would be more effective compared to ordinary calls because it would ensure industries working together across sectors and value chains, based on predefined targets not limited to individual projects for particular participants but for the entire industry concerned. This is a pre-requisite for achieving circular economy goals, where cross-sectoral cooperation along and across value-chain cooperation is vital. A partnership provides the necessary structure to create new circular industries, integrate better the existing ones, optimise material flows across sectors and expand industrial symbiosis approaches among European enterprises and communities, while contributing to the stability of energy grids supplied with an increasing share of variable renewable sources.</p> <p>In addition, the scale and scope of investments required for developing and deploying new game-changing technologies and solutions goes beyond the capacity of individual European or national projects, companies, research institutions and markets. Synergies with regional initiatives, in particular to create industrial hubs for circularity, will be necessary and a partnership would be a much more efficient platform to achieve this.</p>
<p>Relevant for the following parts of Horizon Europe</p>	<p>Pillar II 'Global Challenges and European Industrial Competitiveness'</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Cluster Digital, Industry and Space <input checked="" type="checkbox"/> Cluster Climate, Energy and Mobility <input checked="" type="checkbox"/> Cluster Food, Bioeconomy, Natural Resources, Agriculture and Environment <input checked="" type="checkbox"/> Cross-cluster
<p>Currently identified links with other partnership candidates / Union programmes</p>	<p>In Horizon Europe, a strong governance structure will need to be set to ensure appropriate coordination with other partnerships such as:</p> <p>Clean Hydrogen for Europe (covering production of hydrogen), Bio-based Industries, Discrete Manufacturing ("Made in Europe"), Clean steel, SET Plan Action 6 (energy efficiency in industry), the digital partnerships (cybersecurity, big data, robotics and AI) and the relevant KICs (Raw Material, Climate, InnoEnergy).</p> <p>In contrast to a partnership on discrete manufacturing ("Made in Europe"), this partnership will make the primary contributions for the decarbonisation and resource efficiency of industry; links with the digital partnerships will foster an increasing use of digitisation and AI.</p> <p>The Clean Steel partnership will focus on specific steel activities but will benefit from the cross sectoral R&I and, through its own budget coming mainly from RFCS, it will allow for demonstrations at high TRL of breakthrough technology to retain steel as a value chain in Europe.</p> <p>Deepening the links with the KICs should target the reinforcement of the knowledge triangle, fostering a workforce with the right skills for the future and support to further investments in research outcomes.</p> <p>In the view of creating "project pipelines", it will also need to link with other EU programmes such as the EU-ETS Innovation Fund and LIFE, which respectively support first-of-a-kind (large-scale) demonstrators and</p>

	dissemination and market deployment, or with possible future IPCEIs (low carbon industries have been identified as a priority strategic value chain by the strategic forum on IPCEIs).
Does the proposed partnership build on currently active ones?	<p>SPIRE cPPP, SPIRE – contractual end: 31/12/2020 but projects will be running at least until 2025</p> <p>As explained above, the main difference with SPIRE is the enlarged scope (and therefore partnership composition) and higher ambitions.</p>
Expected type and composition of partners	<p>The partnership should rely on European industrial associations, extending beyond those that are today in SPIRE (adding e.g. pulp and paper, glass, petrochemicals and refinery, and fertilisers), in particular towards raw materials suppliers, advanced materials (e.g. EMIRI, SUSCHEM), engineering (Orgalime), as well as to the main downstream industries (eg construction, automotive, packaging), and recycling industries, as to cover major global and regional circular value chains. Most of these European associations have national counterparts, which facilitates outreach and engagement at local level.</p> <p>It will need to link very strongly with the energy sector (suppliers and network operators) to ensure that the renewable energy and industrial transitions combined with sector coupling are aligned.</p> <p>There is, today, little dialogue between society, public authorities and industry on these matters. The partnership should therefore not only build on ETPs but also involve CSO/NGOs as well as competent authorities, to build bridges between industries and expectations from citizens and policymakers at various levels, in agenda and target settings, and to support related societal changes. Possible actors: as European Climate Foundation, Carbon Market watch, European Environmental Bureau, Ellen MacArthur Foundation, Circle Economy or Sitra.</p> <p>Participation to the programme/projects will be fully open to non-members (no priority, no advantage given to partnership members). The association representing the private side should be open to any new member and open to all stakeholders with regard to technical input requests or, e.g., dissemination activities. The partnership board could be set by the EC, e.g. through a HLG, as to include public actors or CSOs/NGOs.</p> <p>Furthermore, the partnership should identify priorities common to national and regional programmes to more effectively address the European grand challenges by pooling resources under common strategies, and could also explore pathways for international cooperation.</p>
Contributions and commitments expected from partners	<p>The associations in the partnership should at least commit financially to support a bureau.</p> <p>Long-term commitments until 2027 should focus on further private investments to ensure a carbon neutral industry, concrete deployment activities illustrating the market uptake by all the stakeholders concerned. A possible indicator to monitor the leverage of the partnership would be the (increase of) annual private investments in activities related to the partnership or the number of projects developed further (e.g. through the innovation fund, Invest EU, public or private investments such as IPCEIs)</p>
Currently envisaged implementation mode(s).	<input checked="" type="checkbox"/> Co-programmed European Partnership
Justification of the implementation mode	<p>Co-programmed is the preferred implementation mode. It is best fitted with the large range of sectors and actors, and the consequent financial flexibility needs (financial commitments, as those expected from Co-funded or Institutionalised Partnerships are not possible).</p> <p>This partnership can contribute to, or implement, future missions under Horizon Europe, such as on Healthy Oceans and Clean Cities.</p>
Proposed starting year	2021