

General Information	
Preliminary title of the European Partnerships	Global competitive space systems
Short description of the partnership	To enable structured and fast progresses on R&I roadmaps of selected space systems which are key to maintain and expand EU global industrial leadership in space.
Services directly involved	Lead service: DG GROW, Unit I.1 Space policy and research
Context and problem definition	<p>The global context of the space industry is undergoing profound change. Innovative industrial processes are revolutionising the sector. Space activities are increasingly open to private investments in the areas of satellite communications, Earth observation and even launchers. Space is now part of a global value chain that increasingly attracts new companies and entrepreneurs, known as “New Space”, which are pushing the traditional boundaries in the space sector. Security of supply and industry’s ability to export its products are affected by high dependence on non-European critical components and technologies.</p> <p>Today, Europe has a world-class space sector, with a strong satellite manufacturing industry, which captures around 33 % of the open world markets, and a dynamic downstream services sector with a large number of SMEs. The changes mentioned above open new opportunities to develop innovative products, services and processes which can benefit the community in all Member States, creating new capacities and adding value in and outside the space sector. Dynamic global challengers such as USA, China, Japan and India already started to seize these opportunities. As an indicator of this trend while 6 EU vehicle launches were performed in 2010 and 8 in 2018, China performed 15 launches in 2010 and 39 in 2018. In the USA, the private company Space X funded in 2002 achieved 21 launches in 2018... If Europe does not react and adapt quickly to these changes, we risk losing our competitive edge.</p>
Objectives and expected impacts	<p>The proposed initiative will contribute to a number of EU objectives. The first are of course those from the EU Space Strategy (COM(2016)705) and the EU Space programme (COM(2018)447)) which are calling to reinforce the competitiveness of the EU space sector and to enhance our autonomy in accessing and using space. This will not only reinforce the place of the EU as a global leader for space systems and launchers but also foster entrepreneurship and new business opportunities for the use, exploitation and commercialisation of data and services in the downstream sector and contribute to the Europe 2020 strategy for growth and competitiveness. This is also in line with Horizon Europe objective to boost EU innovation capacity and competitiveness in the global context. This initiative will also help the space sector to fully embrace the principles of circular economy.</p> <p>More specifically, a Partnership would enable to:</p> <ul style="list-style-type: none"> ▪ Develop coherent and agreed roadmaps under a strategic research agenda and organise the follow-up of their implementation ▪ Perform structured and accelerated developments and demonstration in areas with an increasing global competition such as on the short term end-to-end space systems for telecommunications and earth observation (two of the main EU export sectors) and on the longer term reconfigurable hybrid/smart satellites, on-orbit manufacturing and assembly, on-orbit servicing, ▪ Perform roadmap based R&I to lower costs and modernise launcher systems such as through components reusability and extended

	<p>launch capacities and missions,</p> <ul style="list-style-type: none"> ▪ Contribute to the development of critical technologies for more independence for satellite / launcher systems produced in the EU according to agreed roadmaps at EU level. ▪ Organise spin-in and synergies with technology sectors which can bring competitive edges in a number of space systems; these are for example artificial intelligence to make decisions on-board of the next generation of satellites, quantum technologies for securing satellite based communications, integration with the 5G network, advanced manufacturing techniques and digital transformation applied to satellites and launchers for lowering their cost, photonics components to boost the capacity of transmission of data, high resolution imaging and sensing for more accurate earth observation. ▪ Active measures to reduce cost, time-to-market, de-risk and encourage entrepreneurship: standardisation, qualification and certification in compliance with recognised standards and processes, supply chain vulnerability mitigation measures (e.g. double sourcing, demand-side measures, IPR policy). <p>The expected impacts over the duration of Horizon Europe duration are to contribute to:</p> <ul style="list-style-type: none"> ▪ Align the stakeholder community efforts, avoid duplication with other actors (ESA, National space programmes), enhance the monitoring of the implementation ▪ Mature [TRL level] the next generation of competitive end-to-end systems in the field of telecommunications and earth observation with a 3-5 years time to market perspective ▪ Bring new concepts for reconfigurable hybrid/smart satellites, on-orbit manufacturing and assembly, on-orbit servicing with a 5-10 years time to market perspective to intermediate maturity [TRL level] ▪ Mature launch systems [TRL level] with significantly lowered cost [xx %] by year [xx] ▪ Increase the portfolio of mature technologies for non-dependence by [xx] % ▪ Spin-in key technologies (digital, quantum, 5G, photonics) in space systems within the next 5 years up to TRL [xx] <p>The quantification and timelines of the impacts should be agreed with stakeholders.</p>
Necessity test: rationale for a European Partnership	<p>Under Horizon 2020, space R&I programming was following mostly a bottom-up approach with a large level of flexibility for proposers. This has proven to be effective for the maturation of individual technologies in the lower-TRL scale. In three specific technologies (electric propulsion, robotics and critical technologies for non-dependence), a roadmap based approach was initiated enabling a strategic planning of topics and the monitoring of progress. For these technologies, maturation was faster and more continuous compared to relying on bottom-up programming of broadly open topics.</p> <p>However, the global context calls for a more structured and a faster development and demonstration of highly complex space systems.</p> <p>The rationale of this Partnership proposal is to bring under one single</p>

	<p>umbrella all the domains where roadmap based approaches are needed under a unique and coherent strategic agenda so as to be capable to maintain or quickly develop a competitive edge. In addition, a Partnership would formalise the cooperation between the public and private actors concerned along a set of shared goals and the commitment to leverage additional resources. A Partnership also allows a tighter monitoring of progress over the years.</p>
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 type="checkbox"/> Cluster Climate, Energy and Mobility</p> <p><input 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>The proposed Partnership would have a number of synergies with other domains of Horizon Europe for example dealing with:</p> <ul style="list-style-type: none"> ▪ Artificial Intelligence, data and robotics for in-orbit operations, ▪ Photonics for the high data transmission capacity, ▪ Key digital technologies for electronic critical electronic components that can ensure non-dependence, ▪ Automatised and digitised manufacturing applied to launchers and satellites, ▪ Communication systems with the capacity of satellites to provide high data transmission capacity and access remote areas or areas subject to the digital divide <p>The expected synergies should focus on the application of the generic developments carried out in these different fields to the specific needs of the space sector as listed above. This could be achieved by co-funding of common topics for example.</p>
Does the proposed partnership build on currently active ones?	No
Expected type and composition of partners	<p>The key stakeholders for such Partnerships are industry and Research and Technology Organisations (RTOs). Close coordination and consistency with activities carried out by national space agencies and the European Space Agency must be ensured during the definition of the roadmaps and the follow-up of the implementation.</p> <p>Major European space industry and research associations (Eurosace, SME4SPACE, ESRE, EARTO) and large system integrators have already expressed their commitment towards the establishment of a dedicated European partnership initiative for space.</p> <p>The above-mentioned associations and related industrial and research entities are representative of the space ecosystem across the value chain and have members in many EU Member States. This would ensure inclusiveness both thematically and geographically.</p> <p>The Commission currently manages a stakeholder's consultation platform and an expert group which gather all these stakeholders in an inclusive but open environment.</p>

Contributions and commitments expected from partners	Partners are expected to complement the activities of the Partnership with R&I projects funded from their own budget and which prove to contribute to an overall strategic agenda. Industry is expected for example to programme complementary activities for the implementation of roadmaps which are critical for the competitiveness and with 3-5 years time to market (e.g. reusability of launcher components). Research and Technology organisations are expected to complement with activities that are relevant to roadmaps with an expected impact in 5-10 years (e.g. reconfigurable satellites, in-orbit servicing, etc.). Space agencies are expected to commit in developing the roadmaps and following-up the implementation in full coherence with national plans. Overall, it is targeted to encompass a volume of effort that is equivalent to the one financed in the Partnership with EU funding.
Currently envisaged implementation mode(s).	<input checked="" type="checkbox"/> Co-programmed European Partnership <input type="checkbox"/> Co-funded European Partnership <input type="checkbox"/> Institutionalised European Partnership <input type="checkbox"/> Article 185 <input type="checkbox"/> Article 187 <input type="checkbox"/> EIT-KIC
Justification of the implementation mode	<p>Under H2020, EU-funded space research was mostly operating on the basis of bottom-up programmed calls with broadly opened topics. In addition to this, in some areas where the EU is exposed to a strong global competition, the current situation calls for specific actions, with a more structured and strategic approach which aligns the stakeholders community efforts, pull resources together and enable a more holistic monitoring of the progress. For this purpose, a stable and long-term framework is needed which gathers under one initiative:</p> <ul style="list-style-type: none"> ▪ A strategic agenda with inclusive roadmap-based implementation and a result-driven methodology with a view to achieving highly demanding technological goals, ▪ Long-term commitment among all partners leveraging efforts to achieve high impact at European and global levels, ▪ Monitoring of the progress of the implementation of the agenda and the roadmaps. <p>Unlike the approach followed under H2020, a Co-programmed Partnership on global competitive space systems offers the potential to gather all these elements under a single and coherent framework.</p>
Proposed starting year	2021