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COMMUNICATION FROM THE COMMISSION

Framework for State aid for research and development and innovation

INTRODUCTION

1. In order to prevent State subsidies from distorting or threaten to distort competition in the internal market and affecting trade between Member States, Article 107(1) of the Treaty on the Functioning of the European Union ('the Treaty') lays down the principle that State Aid is prohibited. In certain cases, however, such aid may be compatible with the internal market on the basis of Articles 107(2) and 107(3) of the Treaty.
2. This Framework provides guidance on the basis of a compatibility assessment conducted by the Commission regarding aid to promote research, development and innovation ('R&D&I') under Article 107(3)(c) of the Treaty. Under Article 107(3)(c) of the Treaty, an aid measure may be declared compatible with the internal market provided that two conditions, a positive and a negative one, are fulfilled. The positive condition requires that the aid must facilitate the development of an economic activity. The negative condition requires that the aid must not adversely affect trading conditions to an extent contrary to the common interest.
3. Whereas it is generally accepted that competitive markets tend to bring about efficient results in terms of prices, output and use of resources, in the presence of market failures¹ State intervention may be necessary to facilitate or incentivise the development of certain economic activities that, in the absence of aid, would not develop or would not develop at the same pace or under the same conditions and, thereby, contribute to smart, sustainable and inclusive growth. In the context of R&D&I, market failures may arise for instance because market players do not necessarily or at least spontaneously take into account the wider positive effects for the European economy, consider reaching a positive economic result as overly risky, and therefore, in the absence of State aid, would engage in a level of R&D&I activities which is too low from the point of view of society. Likewise, in the absence of State aid, R&D&I projects may suffer from insufficient access to finance, due to asymmetric information, or from coordination problems among firms.
4. Therefore, State aid may be necessary to increase R&D&I in a situation where the market, on its own, fails to deliver an efficient outcome hence facilitating the development of certain economic activities. The R&D&I Framework applies to all technologies, industries and sectors to ensure that the rules do not prescribe in advance which research paths would result in new solutions for products, processes and services and do not distort market players' incentives to develop innovative technological solutions even in the presence of high risks. Moreover, the support disbursed under the R&D&I Framework is meant to underpin the recovery of the Union economy from the Covid-19 outbreak. In addition, aid to support R&D&I is likely to bring about wider positive effects than the sole benefits for the aided beneficiary.
5. State aid to R&D&I may, for example, bring about the positive effects in accordance with the Communication from the Commission – The European Green Deal², in which the Commission stresses that “new technologies, sustainable solutions and disruptive innovation are critical to achieve the objectives of the European Green Deal. To keep its

¹ The term 'market failure' refers to situations in which markets, left to their own devices, are unlikely to produce efficient outcomes.

² Communication from the Commission, 'The European Green Deal', COM (2019) 640 final, 11.12.2019.

competitive advantage in clean technologies, the EU needs to increase significantly the large-scale deployment and demonstration of new technologies across sectors and across the single market, building new innovative value chains.”

6. The recently adopted ERA Communication³ identifies R&I as a key driver for boosting Europe’s recovery, accelerating the green and digital transitions and strengthening Europe’s competitive edge. The Communication aims at increasing the efficiency, excellence and impact of Europe’s R&I system and supports innovation based competitiveness. Fostering technological sovereignty in key strategic areas (e.g. Artificial Intelligence and data, microelectronics, quantum computing, 5G, batteries, renewable energy, hydrogen, zero-emission and smart mobility, etc.) is also essential in that context, while supporting open strategic autonomy. To that effect, the Commission proposed that Member States re-affirm the 3% EU GDP R&D⁴ investment target and update it to reflect new EU priorities, including a new 1.25% EU GDP public effort target to be achieved by Member States by 2030 in an EU coordinated manner, to leverage and incentivise private investments.
7. Furthermore, State aid to R&D&I may also bring about the positive effects identified in the Communication on Shaping Europe’s Digital Future⁵ and on a European Strategy for Data⁶. According to the former, there is a need “to ensure that digital solutions help Europe to pursue its own way towards a digital transformation that works for the benefit of people through respecting the European values.”
8. In its Communication on an SME Strategy for a sustainable and digital Europe⁷, the Commission acknowledges that a “competitive sustainability is Europe’s guiding principle for the future. Achieving a climate neutral, resource efficient and agile digital economy requires the full mobilisation of SMEs. This transition to a more economically, environmentally and socially sustainable Europe must go hand in hand with the transition to digitalisation. For this, tailor-made measures are a prerequisite to develop a thriving SME layer of economy as well as to give opportunities for growth to those SMEs that wish to scale up. EU-wide investment is needed in order to create the appropriate business and innovation infrastructure for SMEs.”
9. The New Industrial Strategy for Europe⁸ sets out that Europe needs “industrial policy based on competition, open markets, world-leading research and technologies and a strong single market which brings down barriers and cuts red tape.” Europe “must resist the simplistic temptations that come with protectionism or market distortions, while not being naïve in the face of unfair competition.” It acknowledges that, “stepping up investment in research, innovation, deployment and up-to-date infrastructure will help develop new production processes and create jobs in the process.”

³ Communication from the Commission, ‘A new ERA for Research and Innovation’, COM(2020) 628 final, 30.9.2020.

⁴ This target was endorsed in the Council (Competitiveness) Conclusions of 1 December 2020.

⁵ Communication from the Commission, ‘Shaping Europe’s digital future’, COM(2020) 67 final, 19.2.2020.

⁶ Communication from the Commission, ‘A European strategy for data’, COM(2020) 66 final, 19.2.2020.

⁷ Communication from the Commission, ‘An SME Strategy for a sustainable and digital Europe’, COM(2020) 103 final, 10.3.2020.

⁸ Communication from the Commission, ‘A New Industrial Strategy for Europe’, COM (2020) 102 final, 10.3.2020.

1. SCOPE OF APPLICATION AND DEFINITIONS

1.1. Scope of application

10. The principles set out in this framework concern State aid for R&D&I in all sectors governed by the Treaty. It therefore concerns those sectors which are subject to specific Union rules on State aid, unless such specific rules provide otherwise.
11. Union funding centrally managed by the institutions, agencies, joint undertakings or other bodies of the Union that is not directly or indirectly under the control of Member States⁹ does not constitute State aid. Where such Union funding is combined with State aid, only that State aid will be considered for determining whether notification thresholds and maximum aid intensities are respected or, in the context of this framework, subject to a compatibility assessment.
12. Aid for R&D&I for firms in difficulty, as defined for the purposes of this framework by the Community guidelines on State aid for rescuing and restructuring firms in difficulty¹⁰, as amended or replaced, is excluded from the scope of this framework.
13. When assessing R&D&I aid in favour of a beneficiary that is subject to an outstanding recovery order following a previous Commission decision declaring an aid illegal and incompatible with the internal market, the Commission will take account of the amount of aid still to be recovered¹¹.

1.2. Aid measures covered by the framework

14. The Commission has identified a series of R&D&I measures for which State aid may, under specific conditions, be compatible with the internal market:
 - (a) ***aid for R&D projects*** where the aided part of the research project falls within the categories of fundamental research and applied research, of which the latter can be divided into industrial research and experimental development¹². Such aid is mainly targeted at the market failure related to positive externalities (knowledge spill-overs), but may also address a market failure caused by imperfect and asymmetric information or (mainly in collaboration projects) a coordination failure;
 - (b) ***aid for feasibility studies*** related to R&D projects, which helps overcoming a market failure primarily related to imperfect and asymmetric information;
 - (c) ***aid for the construction and upgrade of research infrastructures***, which mainly addresses the market failure stemming from coordination difficulties but also from imperfect and asymmetric information. High-quality research infrastructures are increasingly necessary for ground-breaking research, as they attract global talent and are essential for example for information and communication technologies

⁹ Including funding provided under Horizon Europe or the Digital Europe Programme.

¹⁰ Communication from the Commission, 'Community Guidelines on State aid for rescuing and restructuring firms in difficulty', OJ C 244, 1.10.2004, p. 2.

¹¹ See Judgment of the Court of First Instance of 13 September 1995, *TWD Textilwerke Deggendorf GmbH v. Commission*, Joined Cases T-244/93 and T-486/93, ECLI:EU:T:1995:160.

¹² The Commission considers that it is useful to maintain different categories of R&D activities regardless of the fact that those activities may follow an interactive model rather than a linear model.

and key enabling technologies¹³. High up-front investment costs for acquiring state of the art scientific facilities and equipment used for early stage research activities, predominantly by the scientific community, make it often impossible to find the necessary financing on the market;

- (d) ***aid for the construction and upgrade of technology infrastructures***, mainly addresses the market failure stemming from imperfect and asymmetric information or a coordination failure. Constructing or upgrading a state of the art technology infrastructure involves high up-front investment costs, which together with a uncertain client base can render access to financing difficult;
- (e) ***aid for innovation activities***, which is mainly targeted at market failures related to positive externalities (knowledge spill-overs), coordination difficulties and, to a lesser extent, asymmetric information. With respect to small and medium-sized enterprises ('SMEs'), such innovation aid may be awarded for obtaining, validating and defending patents and other intangible assets, for the secondment of highly qualified personnel, and for acquiring innovation advisory and support services, for example those provided by research and knowledge dissemination organisations, research infrastructures, technology infrastructures or innovation clusters. Moreover, in order to encourage large enterprises to collaborate with SMEs in process and organisational innovation activities, the costs incurred by both SMEs and large enterprises for such activities may also be supported;
- (f) ***aid for innovation clusters***, which aims at tackling market failures linked with coordination problems hampering the development of clusters, limiting the interactions and knowledge flows within and between clusters. State aid could contribute to resolving this problem, first by supporting the investment in open and shared infrastructures for innovation clusters, and second by supporting, for no longer than ten years, the operation of clusters for the enhancement of collaboration, networking and learning. The fees charged for using the innovation cluster's facilities and for participating in the innovation cluster's activities shall correspond to the market price or reflect their costs (including a reasonable margin). To facilitate access to the innovation cluster facilities or participation in the innovation cluster's activities, access can be offered at reduced prices in compliance with State aid rules as applicable to the users of the services provided by the innovation cluster.

15. Member States must notify R&D&I aid pursuant to Article 108(3) of the Treaty, with the exception of measures that fulfil the conditions laid down in a block exemption Regulation adopted by the Commission pursuant to Article 1 of Council Regulation (EC) No 1588/2015.¹⁴

¹³ Key enabling technologies are defined and identified in the Communication from the Commission, 'A European strategy for Key Enabling Technologies – A bridge to growth and jobs', COM(2012) 341 final, 26.6.2012.

¹⁴ Council Regulation (EU) No 2015/1588 of 13 July 2015 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to certain categories of horizontal State aid, OJ L 248, 24.9.2015, p. 1, as amended by Council Regulation (EU) 2018/1911 of 26 November 2018, OJ L 311, 7.12.2018, p. 8.

16. This framework sets out the compatibility criteria for R&D&I aid schemes and individual aid which are subject to the notification requirement and must be assessed on the basis of Article 107(3)(c) of the Treaty¹⁵.

1.3. Definitions

17. For the purposes of this framework, the following definitions apply:

- (a) '**ad hoc aid**' means aid not awarded on the basis of an aid scheme;
- (b) '**aid**' means any measure fulfilling the criteria laid down in Article 107(1) of the Treaty;
- (c) '**aid intensity**' means the gross aid amount expressed as a percentage of the eligible costs, before any deduction of tax or other charge. Where aid is awarded in a form other than a grant, the aid amount is the grant equivalent of the aid. Aid payable in several instalments is discounted to its value at the date of award. The interest rate to be used for this purpose is the discount rate¹⁶ applicable at the date of award. The aid intensity is calculated per beneficiary;
- (d) '**aid scheme**' means any act on the basis of which, without further implementing measures being required, individual aid may be awarded to undertakings defined therein in a general and abstract manner and any act on the basis of which aid which is not linked to a specific project may be awarded to one or several undertakings;
- (e) '**applied research**' means industrial research, experimental development, or any combination of both;
- (f) '**arm's length**' means that the conditions of the transaction between the contracting parties do not differ from those which would be stipulated between independent enterprises and contain no element of collusion. Any transaction that results from an open, transparent and non-discriminatory procedure is considered as meeting the arm's length principle;
- (g) '**date of award of the aid**' means the date on which the legal right to receive the aid is conferred on the beneficiary under the applicable national legal regime;
- (h) '**digitalisation**' means the introduction of innovative digital technologies and/or solutions to improve and/or upgrade processes, products or service functionalities;
- (i) '**effective collaboration**' means collaboration between at least two independent parties to exchange knowledge or technology, or to achieve a common objective based on the division of labour where the parties jointly define the scope of the collaborative project, contribute to its implementation and share its risks, as well as its results. One or several parties may bear the full costs of the project and thus relieve other parties of its financial risks. Contract research and provision of research services are not considered forms of collaboration;
- (j) '**exclusive development**' means the public procurement of research and development services of which all benefits accrue exclusively to the contracting

¹⁵ The criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of important projects of common European interest, including R&D&I aid assessed on the basis of Article 107(3)(b) of the Treaty, are laid down in a separate Communication from the Commission.

¹⁶ See the Communication from the Commission on the revision of the method for setting the reference and discount rates, OJ C 14, 19.1.2008, p. 6-9.

authority or contracting entity, and which it may use in the conduct of its own affairs on condition that it fully remunerates them;

- (k) **'experimental development'** means acquiring, combining, shaping and using existing scientific, technological, business and other relevant knowledge and skills with the aim of developing new or improved products, processes or services, including new or improved digital products, processes or services, in any area, industry or sector¹⁷. This may also include, for example, activities aiming at the conceptual definition, planning and documentation of new products, processes or services. Experimental development may comprise prototyping, demonstrating, piloting, testing and validation of new or improved products, processes or services in environments representative of real life operating conditions where the primary objective is to make further technical improvements on products, processes or services that are not substantially set. This may include the development of a commercially usable prototype or pilot which is necessarily the final commercial product and which is too expensive to produce for it to be used only for demonstration and validation purposes. Experimental development does not include routine or periodic changes made to existing products, production lines, manufacturing processes, services and other operations in progress, even if those changes may represent improvements;
- (l) **'feasibility study'** means the evaluation and analysis of the potential of a project, which aims at supporting the process of decision making by objectively and rationally uncovering its strengths and weaknesses, opportunities and threats, as well as identifying the resources required to carry it through and ultimately its prospects for success;
- (m) **'full allocation'** means that the research organisation, research infrastructure or public purchaser enjoys the full economic benefit of intellectual property rights by retaining the right to make unrestricted use of them, particularly the right of ownership and the right to license. This may also be the case where the research organisation or research infrastructure (respectively, public purchaser) decides to conclude further contracts concerning those rights, including licensing them to a collaboration partner (respectively, undertakings);
- (n) **'fundamental research'** means experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any direct commercial application or use in view;
- (o) **'gross grant equivalent'** means the amount of the aid if it had been awarded in the form of a grant, before any deduction of tax or other charge;
- (p) **'highly qualified personnel'** means staff having a tertiary education degree and at least five years of relevant professional experience which may also include doctoral training;
- (q) **'individual aid'** means aid that is not awarded on the basis of an aid scheme and notifiable awards of aid on the basis of an aid scheme;
- (r) **'industrial research'** means the planned research or critical investigation aimed at the acquisition of new knowledge and skills for developing new products,

¹⁷ Applicable also to digital industries and technologies, such as super-computing, quantum technologies, block chain technologies, artificial intelligence, cyber security, big data and cloud technologies.

processes or services or for bringing about a significant improvement in existing products, processes or services, including new or improved digital products, processes or services, in any area, industry or sector¹⁸. It comprises the creation of components parts of complex systems, and may include the construction of prototypes in a laboratory environment or in an environment with simulated interfaces to existing systems as well as of pilot lines, when necessary for the industrial research and notably for generic technology validation;

- (s) **'innovation advisory services'** means consultancy, assistance, or training in the fields of knowledge transfer, acquisition, protection or exploitation of intangible assets or the use of standards and regulations embedding them, as well as consultancy, assistance or training on the introduction or use of innovative digital technologies and solutions;
- (t) **'innovation clusters'** means structures or organised groups of independent parties including innovative start-ups, small, medium and large enterprises, as well as research and knowledge dissemination organisations, research infrastructures, technology infrastructures, digital innovation hubs, non-for-profit organisations and other related economic actors, designed to stimulate innovative activity and new ways of collaboration¹⁹ by sharing of facilities and exchange of knowledge and expertise, and by contributing effectively to knowledge transfer, networking, information dissemination and collaboration among the undertakings and other organisations in the cluster²⁰;
- (u) **'innovation support services'** means the provision of office space, data banks, cloud and data storage services, libraries, market research, laboratories, quality labelling, experimentation, testing and certification or other services, including those provided by research and knowledge dissemination organisations, research infrastructures, technology infrastructures or innovation clusters, for the purpose of developing more effective or technologically advanced products, processes or services, including the implementation of innovative digital technologies and solutions;
- (v) **'intangible assets'** means assets that do not have a physical or financial embodiment such as patents, licences, know-how or other intellectual property;
- (w) **'knowledge transfer'** means any process which has the aim of acquiring, collecting and sharing explicit and tacit knowledge, including skills and competence in both economic and non-economic activities such as research collaborations, consultancy, licensing, spin-off creation, publication and mobility of researchers and other personnel involved in those activities. Besides scientific and technological knowledge, it includes other kinds of knowledge such as knowledge on the use of standards and regulations embedding them and on

¹⁸ Applicable also to digital industries and technologies, such as super-computing, quantum technologies, block chain technologies, artificial intelligence, cyber security, big data and cloud or edge technologies.

¹⁹ Such as by digital means.

²⁰ Digital Innovation Hubs (including also European DIHs supported under the centrally managed DEP programme), whose aim is to stimulate the broad uptake of digital technologies like, but not limited to artificial intelligence, HPC and cybersecurity by industry (in particular SMEs) and public sector organisations, could qualify as an innovation cluster in the meaning of this framework, depending on the specific objectives pursued or activities/ functionalities offered by the Digital Innovation Hub.

conditions of real life operating environments and methods for organisational innovation, as well as management of knowledge related to identifying, acquiring, protecting, defending and exploiting intangible assets;

- (x) **'large enterprises'** means undertakings which do not fall within the definition of small and medium-sized enterprises;
- (y) **'net extra costs'** means the difference between the expected net present values of the aided project or activity and a viable counterfactual investment that the beneficiary would have carried out in the absence of aid;
- (z) **'organisational innovation²¹'** means the implementation of a new organisational method in an undertaking's business practices, workplace organisation or external relations, for instance by making use of novel or innovative digital technologies, excluding changes that are based on organisational methods already in use in the undertaking, changes in management strategy, mergers and acquisitions, ceasing to use a process, simple capital replacement or extension, changes resulting purely from changes in factor prices, customisation, localisation, regular, seasonal and other cyclical changes and trading of new or significantly improved products;
- (aa) **'personnel costs'** means the cost of researchers, technicians and other supporting staff to the extent employed on the relevant project or activity;
- (bb) **'pre-commercial procurement'** means the public procurement of research and development services where the contracting authority or contracting entity does not reserve all the results and benefits of the contract exclusively for itself for use in the conduct of its own affairs, but shares them with the providers under market conditions. The contract, the object of which falls within one or several categories of research and development defined in this framework, must be of limited duration and may include the development of prototypes or limited volumes of first products or services in the form of a test series. The purchase of commercial volumes of products or services must not be an object of the same contract;
- (cc) **'process innovation²²'** means the implementation of a new or significantly improved production or delivery method (including significant changes in techniques, equipment or software), for instance by making use of novel or innovative digital technologies, excluding minor changes or improvements, increases in production or service capabilities through the addition of manufacturing or logistical systems which are very similar to those already in use, ceasing to use a process, simple capital replacement or extension, changes resulting purely from changes in factor prices, customisation, localisation, regular, seasonal and other cyclical changes and trading of new or significantly improved products;
- (dd) **'R&D project'** means an operation that includes activities spanning over one or several categories of research and development defined in this framework, and that is intended to accomplish an indivisible task of a precise economic, scientific or technical nature with clearly pre-defined goals. A R&D project may consist of

²¹ Organisational innovation may also include social innovation providing that social innovation activities fall within the scope of the definition.

²² Process innovation may also include social innovation providing that the social innovation activities fall within the scope of the definition.

several work packages, activities or services, and includes clear objectives, activities to be carried out to achieve those objectives (including their expected costs), and concrete deliverables to identify the outcomes of those activities and compare them with the relevant objectives. When two or more R&D projects are not clearly separable from each other and in particular when they do not have independent probabilities of technological success, they are considered as a single project;

- (ee) '**repayable advance**' means a loan for a project which is paid in one or more instalments and the conditions for the reimbursement of which depend on the outcome of the project;
- (ff) '**research and knowledge dissemination organisation**' or 'research organisation' means an entity (such as universities or research institutes, technology transfer agencies, innovation intermediaries, research-oriented physical or virtual collaborative entities), irrespective of its legal status (organised under public or private law) or way of financing, whose primary goal is to independently conduct fundamental research, industrial research or experimental development or to widely disseminate the results of such activities by way of teaching, publication or knowledge transfer. Where such entity also pursues economic activities, the financing, the costs and the revenues of those economic activities must be accounted for separately. Undertakings that can exert a decisive influence upon such an entity, for example in the quality of shareholders or members, may not enjoy a preferential access to the results generated by it;
- (gg) '**research infrastructure**' means facilities, resources and related services that are used by the scientific community to conduct research in their respective fields and covers scientific equipment or set of instruments, knowledge-based resources such as collections, archives or structured scientific information, enabling information and communication technology-based infrastructures such as grid, computing, software and communication, or any other entity of a unique nature essential to conduct research. Such infrastructures may be 'single-sited' or 'distributed' (an organised network of resources)²³;
- (hh) '**secondment**' means temporary employment of staff by a beneficiary with the right for the staff to return to the previous employer;
- (ii) '**small and medium-sized enterprises**' or 'SMEs', 'small enterprises' and 'medium-sized enterprises' means undertakings fulfilling the criteria laid down in the Commission recommendation on the definition of micro, small and medium-sized enterprises²⁴;
- (jj) '**start of works**' or 'start of the project' means either the start of R&D&I activities, or the first agreement between the beneficiary and the contractors to conduct the project, whichever comes first. Preparatory works such as obtaining permits and conducting feasibility studies are not considered as start of works;
- (kk) '**tangible assets**' means assets consisting of land, buildings and plants, machinery and equipment;

²³ See Article 2(a) Council Regulation (EC) No 723/2009 of 25 June 2009 on the Community legal framework for a European Research Infrastructure Consortium (ERIC), OJ L 206, 8.8.2009, p. 1.

²⁴ Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises, OJ L 124, 20.5.2003, p. 36.

- (ll) ‘**technology infrastructure**’ means facilities, equipment, capabilities and related support services required to develop, test and upscale technology to advance through industrial research and experimental development activities from validation in a laboratory to a validation representative of the operational environment, and the users of which are mainly industrial players, including SMEs, which seek support to develop and integrate innovative technologies to develop new products, processes and services, whilst ensuring feasibility and regulatory compliance²⁵.

2. STATE AID WITHIN THE MEANING OF ARTICLE 107(1) OF THE TREATY

18. Generally, any measure meeting the criteria set out in Article 107(1) of the Treaty constitutes State aid. Whilst a separate Commission Notice²⁶ on the notion of State aid clarifies how the Commission understands the notion of State aid in general, this Section considers situations typically arising in the field of R&D&I activities without prejudice to the interpretation of the Court of Justice of the European Union.

2.1. Research and knowledge dissemination organisations and research infrastructures as recipients of State aid

19. Research and knowledge dissemination organisations ('research organisations') and research infrastructures are recipients of State aid if their public funding fulfils all conditions of Article 107(1) of the Treaty. Pursuant to the Commission Notice on the notion of State aid, and in accordance with the case-law of the Court of Justice, the beneficiary must qualify as an undertaking, but that qualification does not depend upon its legal status, that is to say whether it is organised under public or private law, or its economic nature, that is to say whether it seeks to make profits or not. Rather, what is decisive for that qualification as an undertaking is whether it carries out an economic activity consisting of offering products or services on a given market²⁷.

2.1.1. Public funding of non-economic activities

20. Where the same entity carries out activities of both economic and non-economic nature, the public funding of the non-economic activities will not fall under Article 107(1) of the Treaty if the two kinds of activities and their costs, funding and revenues can be clearly separated so that cross-subsidisation of the economic activity is effectively avoided. Evidence of due allocation of costs, funding and revenues can consist of annual financial statements of the relevant entity.
21. The Commission considers that the following activities are generally of a non-economic character:
- (a) primary activities of research organisations and research infrastructures, in particular:

²⁵ See Commission Staff Working Document, ‘Technology Infrastructures’, SWD(2019) 158 final, 8.4.2019.

²⁶ European Commission, ‘Commission Notice on the notion of State aid as referred to in Article 107(1) of the Treaty on the Functioning of the European Union’, OJ C 262, 19.7.2016, p. 1.

²⁷ See Judgment of the Court of Justice of 16 June 1987, Commission v. Italy, C-118/85, ECLI:EU:C:1987:283, paragraph 7; Judgment of the Court of Justice of 18 June 1998, Commission v. Italy, C-35/96, ECLI:EU:C:1998:303, paragraph 36; Judgment of the Court of Justice of 19 February 2002, Wouters, C-309/99, ECLI:EU:C:2002:98, paragraph 46.

- (i) education for more and better skilled human resources. In line with case-law²⁸ and decisional practice of the Commission²⁹, and as explained in the Notice on the notion of State aid and the SGEI Communication³⁰, public education organised within the national educational system, predominantly or entirely funded by the State and supervised by the State is considered as a non-economic activity³¹;
 - (ii) independent R&D for more knowledge and better understanding, including collaborative R&D where the research organisation or research infrastructure engages in effective collaboration³²;
 - (iii) wide dissemination of research results on a non-exclusive and non-discriminatory basis, for example through teaching, open-access databases, open publications or open software.
- (b) knowledge transfer activities, where they are conducted either by the research organisation or research infrastructure (including their departments or subsidiaries) or jointly with, or on behalf of other such entities, and where all profits from those activities are reinvested in the primary activities of the research organisation or research infrastructure. The non-economic nature of those activities is not prejudiced by contracting the provision of corresponding services to third parties by way of open tenders.
22. Where a research organisation or research infrastructure is used for both economic and non-economic activities, public funding falls under State aid rules only insofar as it covers costs linked to the economic activities³³. Where the research organisation or research infrastructure is used almost exclusively for a non-economic activity, its funding may fall outside state aid rules in its entirety³⁴, provided that the economic use remains purely ancillary, that is to say corresponds to an activity which is directly related to and necessary for the operation of the research organisation or research infrastructure or intrinsically linked to its main non-economic use, and which is limited in scope. For the purposes of this framework, the Commission will consider this to be the case where the economic activities consume exactly the same inputs (such as material, equipment, labour and fixed capital) as the non-economic activities and the

²⁸ See Judgment of the Court of Justice of 27 September 1988, *Humble and Edel*, C-263/86, ECLI:EU:C:1988:451, paragraphs 9-10, 15-18; Judgment of the Court of Justice of 7 December 1993, *Wirth*, C-109/92, ECLI:EU:C:1993:916, paragraph 15.

²⁹ See for instance cases NN54/2006, *Přerov logistics College*, and N 343/2008, *Individual aid to the College of Nyíregyháza for the development of the Partium Knowledge Centre*.

³⁰ See Communication from the Commission on the application of the European Union State aid rules to compensation granted for the provision of services of general economic interest, OJ C 8, 11.1.2012, p. 4, paragraphs 26-29.

³¹ Workforce training, in the sense of State aid rules for training aid, does not qualify as a non-economic primary activity of research organisations.

³² Provision of R&D services and R&D carried out on behalf of undertakings are not considered as independent R&D.

³³ Where a research organisation or research infrastructure is both publicly and privately funded, the Commission will consider this to be the case where the public funding allocated to the relevant entity for a specific accounting period exceeds the costs of non-economic activities incurred in that period.

³⁴ Since the research community, when conducting ancillary economic activities, derives improved and enhanced expertise and knowledge that can be used to perform the primary non-economic activities of the research organisation or the research infrastructure to the benefit of the society at large.

capacity allocated each year to such economic activities does not exceed 20 % of the relevant entity's overall annual capacity. The monitoring of the ancillary character of the economic activity shall apply for at least 10 years from the start of operations of the research organisation or the research infrastructure. In case the research infrastructure or the research organisation increases its economic activity so that it cannot be considered as ancillary, the public funding of the whole economic activity will fall under State aid rules.

2.1.2. *Public funding of economic activities of research organisations and research infrastructures*

23. Without prejudice to point 22, where research organisations or research infrastructures are used to perform economic activities, such as renting out equipment or laboratories to undertakings, supplying services to undertakings or performing contract research, public funding of those economic activities will generally be considered State aid.

24. However, the Commission will not consider the research organisation or research infrastructure to be a beneficiary of State aid if it acts as a mere intermediary for passing on to the final recipients the totality of the public funding and any advantage acquired through such funding. This is generally the case where:

- (a) both the public funding and any advantage acquired through such funding are quantifiable and demonstrable, and there is an appropriate mechanism which ensures that they are fully passed on to the final recipients, for example through reduced prices, and
- (b) no further advantage is awarded to the intermediary because it is either selected through an open tender procedure or the public funding is available to all entities which satisfy the necessary objective conditions, so that customers as final recipients are entitled to acquire equivalent services from any relevant intermediary.

25. Where the conditions in point 24 are fulfilled, State aid rules apply at the level of the final recipients.

2.2. **Indirect State aid to undertakings through public funded research and knowledge dissemination organisations and research infrastructures**

26. The question of whether and under which conditions undertakings obtain an advantage within the meaning of Article 107(1) of the Treaty in cases of contract research or research services provided by a research organisation or research infrastructure, as well as in cases of collaboration with a research organisation or research infrastructure must be answered in accordance with general State aid principles. To this purpose, as explained in the Notice on the notion of State aid, it may in particular be necessary to assess whether the behaviour of the research organisation or research infrastructure can be imputed to the State³⁵.

2.2.1. *Research on behalf of undertakings (contract research or research services)*

27. Where a research organisation or research infrastructure is used to perform contract research or provide a research service to an undertaking, which typically specifies the

³⁵ See Judgment of the Court of Justice of 16 May 2002, *France v. Commission*, C-482/99, ECLI:EU:C:2002:294, paragraph 24.

terms and conditions of the contract, owns the results of the research activities and carries the risk of failure, no State aid will usually be passed to the undertaking if the research organisation or research infrastructure receive payment of an adequate remuneration for its services, particularly where one of the following conditions is fulfilled:

- (a) the research organisation or research infrastructure provides its research service or contract research at market price³⁶, or
- (b) where there is no market price, the research organisation or research infrastructure provides its research service or contract research at a price which:
 - reflects the full costs of the service and generally includes a margin established by reference to those commonly applied by undertakings active in the sector of the service concerned, or
 - is the result of arm's length negotiations where the research organisation or research infrastructure, in its capacity as service provider, negotiates in order to obtain the maximum economic benefit at the moment when the contract is concluded and covers at least its marginal costs.

28. Where the ownership of, or access rights to intellectual property rights ('IPR') remain with the research organisation or research infrastructure, their market value may be deducted from the price payable for the services concerned.

2.2.2. *Collaboration with undertakings*

29. A project is considered to be carried out through effective collaboration where at least two independent parties pursue a common objective based on the division of labour and jointly define its scope, participate in its design, contribute to its implementation and share its financial, technological, scientific and other risks, as well as its results. One or several parties may bear the full costs of the project and thus relieve other parties of its financial risks. The terms and conditions of a collaboration project, in particular as regards contributions to its costs, the sharing of risks and results, the dissemination of results, access to and rules for allocation of IPR, must be concluded prior to the start of the project³⁷. Contract research and provision of research services are not considered to be forms of collaboration.

30. Where collaboration projects are carried out jointly by undertakings and research organisations or research infrastructures, the Commission considers that no indirect State aid is awarded to the participating undertakings through those entities due to favourable conditions of the collaboration³⁸ if one of the following conditions is fulfilled:

- (a) the participating undertakings bear the full cost of the project, or

³⁶ Where the research organisation or research infrastructure provides a specific research service or carries out contract research for the first time on behalf of a given undertaking, on a trial basis and during a clearly limited period of time, the Commission will normally consider the price charged as a market price where that research service or contract research is unique and it can be shown that there is no market for it.

³⁷ This does not include definite agreements on the market value of resulting IPR and the value of contributions to the project.

³⁸ Including in the form of material transfer agreements, where a research organisation or a research infrastructure transfers materials to an undertaking for the recipient's own R&D activities.

- (b) the results of the collaboration which do not give rise to IPR may be widely disseminated and any IPR resulting from the activities of research organisations or research infrastructures are fully allocated to those entities, or
 - (c) any IPR resulting from the project, as well as related access rights are allocated to the different collaboration partners in a manner which adequately reflects their work packages, contributions and respective interests, or
 - (d) the research organisations or research infrastructures receive compensation equivalent to the market price for the IPR which result from their activities and are assigned to the participating undertakings, or to which participating undertakings are allocated access rights. The absolute amount of the value of any contribution, both financial and non-financial, of the participating undertakings to the costs of the research organisations or research infrastructures' activities that resulted in the IPR concerned, may be deducted from that compensation.
31. For the purpose of point 31(d), the Commission will consider that the compensation received is equivalent to the market price if it enables the research organisations or research infrastructures concerned to enjoy the full economic benefit of those rights, where one of the following conditions is fulfilled:
- (a) the amount of the compensation has been established by means of an open, transparent and non-discriminatory competitive sale procedure, or
 - (b) an independent expert valuation confirms that the amount of the compensation is at least equal to the market price, or
 - (c) the research organisation or research infrastructure, as seller, can demonstrate that it effectively negotiated the compensation, at arm's length conditions, in order to obtain the maximum economic benefit at the moment when the contract is concluded, while considering its statutory objectives, or
 - (d) in cases where the collaboration agreement provides the collaborating undertaking with a right of first refusal as regards IPR generated by the collaborating research organisations or research infrastructures, where those entities exercise a reciprocal right to solicit more economically advantageous offers from third parties so that the collaborating undertaking has to match its offer accordingly.
32. If none of the conditions in point 31 are fulfilled, the full value of the contribution of the research organisations or research infrastructures to the project will be considered as an advantage for the collaborating undertakings, to which State aid rules apply.

2.3. Public procurement of research and development services

33. Public purchasers may procure research and development services from undertakings, through both exclusive development and pre-commercial procurement procedures³⁹.
34. As long as an open tender procedure for the public procurement is carried out in accordance with the applicable directives⁴⁰, the Commission will generally consider that

³⁹ See the Communication and associated staff working document – Communication from the Commission, ‘Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe’, COM(2007) 799 final, 14.12.2007.

⁴⁰ See Article 27 of Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC (OJ L 94, 28.3.2014, p. 65) and Article 45 of

no State aid within the meaning of Article 107(1) of the Treaty is awarded to the undertakings delivering the relevant services⁴¹.

35. In all other cases, including pre-commercial procurement, the Commission will consider that no State aid is awarded to undertakings where the price paid for the relevant services fully reflects the market value of the benefits received by the public purchaser and the risks taken by the participating providers, in particular where all of the following conditions are fulfilled:
- (a) the selection procedure is open, transparent and non-discriminatory, and is based on objective selection and award criteria specified in advance of the bidding procedure;
 - (b) the envisaged contractual arrangements describing all rights and obligations of the parties, including with regard to IPR, are made available to all interested bidders in advance of the bidding procedure;
 - (c) the procurement does not give any of the participant providers any preferential treatment in the supply of commercial volumes of the final products or services to a public purchaser in the Member State concerned⁴², and
 - (d) one of the following conditions is fulfilled:
 - all results which do not give rise to IPR may be widely disseminated, for example through publication, teaching or contribution to standardisation bodies in a way that allows other undertakings to reproduce them, and any IPR are fully allocated to the public purchaser, or
 - any service provider to which results giving rise to IPR are allocated is required to grant the public purchaser unlimited access to those results free of charge, and to grant access to third parties, for example by way of non-exclusive licenses, under market conditions.
36. Where the conditions set out in point 35 are not fulfilled, Member States may rely on an individual assessment of the terms of the contract between the public purchaser and the undertaking, without prejudice to the general obligation to notify R&D&I aid pursuant to Article 108(3) of the Treaty.

3. COMPATIBILITY ASSESSMENT OF R&D&I AID

37. On the basis of Article 107(3)(c) of the Treaty, the Commission may consider compatible with the internal market State aid to facilitate the development of certain

Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors and repealing Directive 2004/17/EC (OJ L 94, 28.3.2014, p. 243). Likewise, in the case of a restricted procedure within the meaning of respectively Articles 28 of Directive 2014/24/EU and Article 46 of Directive 2014/25/EU, the Commission will also consider that no State aid is awarded to undertakings, unless interested providers are prevented from tendering without valid reasons.

⁴¹ This will also be the case where public purchasers procure innovative solutions resulting from a preceding R&D procurement, or non-R&D products and services that are to be delivered to a performance level requiring a product, process or organisational innovation.

⁴² Without prejudice to procedures that cover both the development and the subsequent purchase of unique or specialised products or services.

economic activities within the European Union, where such aid does not adversely affect trading conditions to an extent contrary to the common interest.

38. In this Section, the Commission clarifies how it will apply the compatibility assessment principles and, where applicable, lays down specific conditions for aid schemes and additional conditions for individual aid which is subject to the obligation of notification.
39. In order to assess whether State aid for R&D&I can be considered compatible with the internal market, the Commission will determine whether the aid measure facilitates the development of a certain economic activity) and whether it adversely affects trading conditions to an extent contrary to the common interest.
40. In order to make the assessment referred to in point 39, the Commission will consider the following aspects:

(a) First condition: R&D&I aid facilitates the development of an economic activity

- (i) *identity the economic activity* (section 3.1.1)
- (ii) *incentive effect*: evaluating whether the aid changes the behaviour of the undertaking or undertakings concerned in such a way that such undertaking or undertakings engage in additional activity, which would not be carried out without the aid or which would be carried out in a restricted or different manner or location (section 3.1.2).
- (iii) *the aid does not contravene relevant provisions and principles of EU law* (section 3.1.3)

(b) Second condition: R&D&I aid does not unduly affect trading conditions to an extent contrary to the common interest

- (i) *need for State intervention*: the aid measure must bring about a material improvement that the market cannot deliver by itself, for example by remedying a market failure or addressing an equity or cohesion concern where applicable (section 3.2.1).
- (ii) *appropriateness of the aid measure*: the proposed aid measure must be an appropriate policy instrument to facilitate the development of the economic activity (section 3.2.2).
- (iii) *proportionality of the aid (aid to the minimum)*: the amount and intensity of the aid must be limited to the minimum needed to induce the additional investment or activity by the undertaking(s) concerned (section 3.2.3).
- (iv) *transparency of aid*: Member States, the Commission, economic operators, and the public, must have easy access to all relevant acts and to pertinent information about the aid awarded thereunder (section 3.2.4).
- (v) *negative effects that R&D&I aid can have on competition and trade between Member States must be minimized or avoided*: (section 3.2.5).
- (vi) *weighing up the positive and negative effects of the aid* (section 3.2.6)

3.1. First condition: R&D&I aid facilitates the development of an economic activity

3.1.1. Identifying the supported economic activity

41. The Commission will assess, based on the information provided by the Member State, which economic activity will be supported by the notified measure.

3.1.2. Incentive effect

3.1.2.1 General conditions

42. R&D&I aid can be found compatible with the internal market if it has an incentive effect. The Commission considers that aid without incentive effect does not facilitate the development of an economic activity.

43. An incentive effect occurs where the aid changes the behaviour of an undertaking in such a way that it engages in additional activities, which it would not carry out or it would carry out in a restricted or different manner without the aid. The aid must however not subsidise the costs of an activity that an undertaking would anyhow incur and must not compensate for the normal business risk of an economic activity⁴³.

44. The Commission considers that aid does not present an incentive for the beneficiary wherever work on the relevant R&D&I activity⁴⁴ has already started prior to the aid application by the beneficiary to the national authorities⁴⁵. Where start of works takes place before the aid application is submitted by the beneficiary to the national authorities, the project will not be eligible for aid.

45. The aid application must include at least the applicant's name and size, a description of the project, including its location and start and end dates, the amount of public support needed to carry it out, and a list of eligible costs.

46. To the extent they constitute State aid, the Commission may consider that fiscal measures have an incentive effect, by stimulating higher R&D&I spending by undertakings, on the basis of evaluation studies⁴⁶ provided by Member States.

3.1.2.2. Additional conditions for individual aid

47. For notifiable individual aid, Member States must demonstrate to the Commission that the aid has an incentive effect and therefore need to provide clear evidence that the aid has a positive impact on the decision of the undertaking to pursue R&D&I activities which would otherwise not have been pursued. In order to enable the Commission to carry out a comprehensive assessment of the aid measure in question, the Member State

⁴³ See Judgment of the Court of Justice, *HGA and Others v. Commission*, Joined Cases C-630/11 P to C-633/11 P, ECLI:EU:C:2013:387.

⁴⁴ If the aid application is for an R&D project, this does not exclude that the potential beneficiary would have already carried out feasibility studies, which are not covered by the request for aid.

⁴⁵ In the case of aid for projects or activities that are carried out in successive phases which may be subject to separate aid awarding procedures, this means that start of works must not take place before the first aid application. In the case of aid awarded under an automatic fiscal aid scheme, such scheme must have been adopted and entered into force before any work on the aided project or activity starts.

⁴⁶ Even though this may not be possible *ex ante* for a newly introduced measure, Member States will be expected to provide evaluation studies on the incentive effect of their own fiscal aid schemes (so that planned or intended methodologies for *ex post* evaluations should normally be part of the design of such measures). In the absence of any evaluation studies, the incentive effect of fiscal aid schemes may be presumed only for incremental measures.

concerned must provide not only information concerning the aided project but also, to the extent possible, a comprehensive description of what would have happened or could reasonably have been expected to happen without aid, that is to say the counterfactual scenario. The counterfactual scenario may consist in the absence of an alternative project or in a clearly defined and sufficiently predictable alternative project considered by the beneficiary in its internal decision making, and may relate to an alternative project that is wholly or partly carried out outside the Union.

48. In its analysis, the Commission will take into consideration the following elements:
- (i) **specification of intended change:** the change in behaviour which is expected to result from State aid, that is to say whether a new project is triggered, or the size, scope or speed of a project is enhanced, has to be well specified;
 - (ii) **counterfactual analysis:** the change of behaviour has to be identified by comparing what the expected outcome and level of intended activity would be with and without aid. The difference between the two scenarios shows the impact of the aid measure and its incentive effect;
 - (iii) **level of profitability:** where a project or investment would not, in itself, be profitable to carry out for an undertaking, but would generate important benefits for society, it is more likely that the aid has an incentive effect;
 - (iv) **amount of investment and timeframe of cash flows:** a high start-up investment, a low level of appropriable cash flows and a significant fraction of the cash flow arising in the very far future or in a very uncertain manner, will be considered positive elements in assessing the incentive effect;
 - (v) **level of risk involved:** the assessment of risk will in particular take into account the irreversibility of the investment, the probability of commercial failure, the risk that the project will be less productive than expected, the risk that the project undermines other activities of the aid beneficiary and the risk that the project costs undermine its financial viability.
49. Member States are in particular invited to rely on board documents, risk assessments, financial reports, internal business plans, expert opinions and other studies related to the project under assessment. Documents containing information on demand forecasts, cost forecasts, financial forecasts, documents that are submitted to an investment committee and that describe in detail various investment scenarios, or documents provided to financial institutions could help Member States demonstrate the incentive effect.
50. In order to ensure that the incentive effect is established on an objective basis, the Commission may in its assessment compare company-specific data with data concerning the industry in which the aid beneficiary is active. In particular, Member States should where possible provide industry-specific data demonstrating that the beneficiary's counterfactual scenario, its required level of profitability and its expected cash-flows are reasonable.
51. In that context, the level of profitability can be evaluated by reference to methodologies which are demonstrably used by the beneficiary undertaking or are standard practice in the particular industry concerned, and which may include methods for evaluating the net

present value of the project (NPV)⁴⁷, the internal rate of return (IRR)⁴⁸ or the average return on capital employed (ROCE).

52. Furthermore, in the case of investment support for cross-border R&D activities, research infrastructures, technology infrastructures as well as innovation clusters, the Commission will consider investments which facilitate cross-border cooperation or are financed by more than one Member State, to be an element which may strengthen the incentive effect of the aid as there can be a strong presumption that the aid is incentivising R&D&I activities that result in a project which is bigger in size, or scope, or the speed of the project is facilitated by the aid, or the total project's costs are higher (see recital 138 below) because of the targeted enlarged demand of the activities, as compared to a project aimed at meeting only national needs.
53. Therefore, aid will not be considered compatible with the internal market in cases where it appears that the same activities could and would be pursued even without the aid.

3.1.3 No breach of relevant Union law

54. If a State aid measure, the conditions attached to it, including its financing method when the financing method forms an integral part of the State aid measure, or the activity it finances entails a violation of relevant Union law, the aid cannot be declared compatible with the internal market⁴⁹.
55. In assessing the compatibility of any individual aid with the internal market, the Commission will notably take into account any infringement proceedings relative to Articles 101 or 102 of the Treaty which may concern the beneficiary of the aid and which may be relevant for its assessment under Article 107(3) of the Treaty⁵⁰.

3.2. Second condition: R&D&I aid does not unduly affect trading conditions to an extent contrary to the common interest

56. Pursuant to Article 107(3)(c) of the Treaty aid to facilitate the development of certain economic activities or of certain economic areas can be declared compatible, but only “where such aid does not adversely affect trading conditions to an extent contrary to the common interest.”
57. The assessment of the negative effects on the internal market involves complex economic and social assessments. This Section sets out the method of exercise of the Commission's discretion in carrying out the assessment under the second condition of the compatibility assessment referred to in point 40 (b).

⁴⁷ The net present value of a project is the difference between the positive and negative cash flows over the lifetime of the investment, discounted to their current value (using the cost of capital).

⁴⁸ The IRR is not based on accounting earnings in a given year, but takes into account the stream of future cash flows that the investor expects to receive over the entire lifetime of the investment. It is defined as the discount rate for which the NPV of a stream of cash flows equals zero.

⁴⁹ See for instance Judgment of the Court of Justice of 19 September 2000, *Germany v. Commission*, C-156/98, ECLI:EU:C:2000:467, paragraph 78; Judgment of the Court of Justice of 22 December 2008, *Société Régie Networks v. Rhône-Alpes Bourgogne*, C-333/07, ECLI:EU:C:2008:764, paragraphs 94-116; Judgment of the Court of Justice of 22 September 2020, *Austria v Commission*, C-594/18 P, ECLI:EU:C:2020:742, paragraph 44; Judgment of the Court of Justice of 14 October 2010, *Nuova Agricast v. Commission*, C-67/09 P, ECLI:EU:C:2010:607, paragraph 51.

⁵⁰ See Judgment of the Court of Justice of 15 June 1993, *Matra v. Commission*, C-225/91, ECLI:EU:C:1993:239, paragraph 42.

58. By its very nature, any aid measure generates distortions of competition and has an effect on trade between Member States. However, in order to establish if the distortive effects of the aid are limited to the minimum, the Commission will verify whether the aid is necessary, appropriate, proportionate and transparent.
59. The Commission will then assess the distortive effect of the R&D&I aid in question on competition and trading conditions. More specifically, aid in the field of R&D&I can cause specific product market distortions and location effects. The Commission will then balance the positive effects of the aid with its negative effects on competition and trade. Where the positive effects outweigh the negative effects, the Commission will declare the aid compatible.

3.2.1. Need for State intervention

60. A State aid measure must be targeted towards a situation where aid can bring about a material development that the market cannot deliver by itself, for example by remedying a market failure to the R&D&I activity or investment in question.

3.2.1.1. General conditions

61. State aid may be necessary to increase R&D&I in a situation where the market, on its own, fails to deliver an efficient outcome. In order to assess whether State aid is effective in reaching the intended outcome, it is first necessary to identify the problem to be addressed. State aid should be targeted towards situations where it can bring about a material development that the market cannot deliver on its own. Member States should explain how the aid measure can effectively mitigate the identified market failures, hindering the implementation of the R&D&I activity or investment in question by the market on its own.
62. R&D&I takes place through a series of activities, which are usually upstream to a number of product markets and exploit available capabilities to develop new or improved products, services and processes in those product markets or completely new ones, thereby fostering growth in the economy, contributing to territorial and social cohesion or furthering the general consumer interest. However, given the available R&D&I capabilities, market failures may be an obstacle to reaching the optimal output and may lead to an inefficient outcome for the following reasons:
 - (i) **positive externalities or knowledge spill-overs:** R&D&I often generate benefits for society in the form of positive spill-over effects, for example knowledge spill-overs or enhanced opportunities for other economic actors to develop complementary products and services. However, if left to the market, a number of projects might have an unattractive rate of return from a private perspective, although they would be beneficial for society, because profit seeking undertakings cannot sufficiently appropriate the benefits of their actions when deciding about the amount of R&D&I they should carry out. State aid may therefore contribute to the implementation of projects which result in an overall societal or economic benefit and which would otherwise not be pursued.

However, neither are all benefits of R&D&I activities externalities, nor does the presence of externalities alone automatically mean that State aid is compatible with the internal market. In general, consumers are willing to pay for the direct benefit of new products and services while firms can appropriate the benefits from their investment through other existing instruments, such as IPR. In some cases,

however, those means are imperfect and leave a residual market failure that may be corrected by State aid. For instance, as is often argued for fundamental research, it may be difficult to exclude others from gaining access to the results of some activities, which might therefore have a public good character. On the other hand, more specific knowledge related to production can often be well protected, for example through patents, allowing the inventor to reap a higher return on the invention;

- (ii) **imperfect and asymmetric information:** R&D&I activities are characterised by a high degree of uncertainty. Under certain circumstances, due to imperfect and asymmetric information, private investors may be reluctant to finance valuable projects and highly-qualified personnel may be unaware of recruitment possibilities in innovative undertakings. As a result, the allocation of human and financial resources may not be adequate and projects which may be valuable for society or the economy may not be carried out.

In certain cases, imperfect and asymmetric information may also hamper access to finance. However, imperfect information and the presence of risk do not automatically justify the need for State aid. Projects with lower private returns on investments not being financed can very well be a sign of market efficiency. Moreover, risk is part of every business activity and is not a market failure in itself. However, in a context of asymmetric information, risk may exacerbate financing problems;

- (iii) **coordination and network failures:** the ability of undertakings to coordinate with each other or to interact in order to deliver R&D&I may be impaired for various reasons, including difficulties in coordinating among a large number of collaboration partners where some of them have diverging interests, problems in designing contracts, and difficulties in coordinating collaboration due for example to sensitive information being shared.

3.2.1.2. Additional conditions for individual aid

- 63. Whilst certain market failures may hamper R&D&I generally, not all undertakings and sectors in the economy are affected by them to the same extent. Consequently, for notifiable individual aid, Member States should provide adequate information about whether the aid addresses a general market failure regarding R&D&I, or a specific market failure to R&D&I affecting, for example, a particular sector or line of business.
- 64. The Commission will take into consideration the following elements:
 - (i) **knowledge spill-overs:** level of knowledge dissemination envisaged; specificity of the knowledge created; availability of IPR protection; degree of complementarity with other products and services;
 - (ii) **imperfect and asymmetric information:** level of risk and complexity of R&D&I activities; need for external finance; characteristics of the aid beneficiary regarding access to external finance;
 - (iii) **coordination failures:** number of collaborating undertakings; intensity of collaboration; diverging interests among collaborating partners; problems in designing contracts; problems to coordinate collaboration.

65. In its analysis of an alleged market failure hindering the R&D&I activities to be triggered by the aid measure, the Commission will in particular take into account any available sectoral comparisons and other studies, which should be provided by the Member State concerned.
66. Where notifying investment or operating aid for clusters, Member States must provide information on the planned or expected specialisation of the innovation cluster, existing regional potential and presence of clusters in the Union with similar purposes. Where relevant, Member States should also explain how the cluster can have a positive effect on the technological advancement and digital transformation of the Union economy. Where the supported innovation cluster is a Digital Innovation Hub, the Commission will presume such contribution. In its analysis, the Commission will analyse whether the collaborations which would be stimulated or incentivised by the innovation cluster's activities might aim, amongst others, to shorten the time needed from the creation of new knowledge to transposing it into innovative applications such as products, services and processes and solutions, also based on digital technologies, helping transforming the Union economy in accordance with the Green Deal and the Digital Europe Communication.
67. Where notifying investment aid for technology infrastructures, Member States must provide detailed and precise information on the planned or expected specialisation of the technology infrastructure, its state of the art character and the role the technology infrastructure could play in facilitating at regional, national or Union level the digital and green transition of the Union economy. Member States must also provide information on whether there are similar technology infrastructures, whether publicly funded or not, in the Union. In addition, Member States should provide information on the profile of the users, such as size, sector and other relevant information. The Commission will consider in its assessment the extent to which the capacity of the infrastructure would be allocated to services provided to SMEs and hence provide opportunities for SMEs to improve the efficiency of own production processes and their ability to innovate products and business models, in particular facilitated by access to digital technologies.
68. With respect to State aid which is awarded for projects or activities that are also financed by the Union, either directly or indirectly (that is to say by the Commission, by its executive agencies, by joint undertakings established on the basis of Articles 185 and 187 of the Treaty, or by any other implementing bodies where the Union funding is not directly or indirectly under the control of Member States), the Commission will consider that the need for State intervention has been established.
69. On the other hand, where State aid is awarded for projects or activities which, with respect to their technological content, level of risk and size, are similar to those already delivered within the Union at market conditions, the Commission will in principle presume that no market failure is present and will require further evidence of and justification for the need for State intervention. In particular, in the case of technology infrastructures and innovation clusters, Member States must demonstrate that the public support will not lead to duplication in services already offered by existing structures operating within the Union, which could lead to idle capacities and put into question the economic viability of the supported investment.

3.2.2 Appropriateness of the aid measure

70. The proposed aid measure must be an appropriate policy instrument to achieve the intended objective of the aid, that is to say there must not be a better placed and less distortive policy and aid instrument capable of achieving the same results.

3.2.2.1. Appropriateness among alternative policy instruments

71. State aid is not the only policy instrument available to Member States to promote R&D&I activities. It is important to keep in mind that there may be other, better placed instruments such as demand-side measures involving regulation, public procurement or standardisation, as well as an increase in funding of public research and education and general fiscal measures. The appropriateness of a policy instrument in a given situation is normally linked to the nature of the problem that is being addressed. For instance, reducing market barriers may be more appropriate than State aid to deal with a new entrant's difficulty to appropriate R&D&I results. Increased investment in education may be more appropriate to deal with a lack of qualified personnel than awarding State aid.
72. Aid for R&D&I can be authorised as an exception to the general prohibition of State aid, where it is necessary to enable the R&D&I in question. An important element in that respect is therefore whether and to what extent aid for R&D&I can be considered an appropriate instrument to increase R&D&I activities, given that other less distortive instruments may achieve the same results.
73. In its compatibility analysis, the Commission takes particularly into account the impact assessment of the proposed measure carried out by the Member State concerned. Measures, for which Member States have considered other policy options and for which the advantages of using a selective instrument such as State aid are established and submitted to the Commission, are considered to constitute an appropriate instrument.
74. With respect to State aid which is awarded for projects or activities that are also financed by the Union, either directly or indirectly, that is to say by the Commission, by its executive agencies, by joint undertakings established on the basis of Articles 185 and 187 of the Treaty, or by any other implementing bodies where the Union funding is not directly or indirectly under the control of Member States, the Commission will consider that the appropriateness of the aid measure has been established. Member States should demonstrate that the State aid for the assessed project or activity would create synergies with any funding or co-financing from Union programmes.

3.2.2.2. Appropriateness among different aid instruments

75. State aid for R&D&I can be awarded in various forms. Member States should therefore ensure that the aid is awarded in the form that is likely to generate the least distortions of competition and trade. In this respect, where the aid is awarded in forms that provide a direct pecuniary advantage, such as direct grants, exemptions or reductions in taxes or other compulsory charges, or the supply of land, products or services at favourable prices, the Member State concerned must include an analysis of other options and explain why or how other potentially less distortive forms of aid such as repayable advances or forms of aid that are based on debt or equity instruments, such as State guarantees, the purchase of a share-holding or an alternative provision of debt or capital on favourable terms, are less appropriate.

76. The choice of the aid instrument should be made on the basis of the market failure it seeks to address. For instance, where the underlying market failure is a problem of access to external debt finance due to asymmetric information, Member States should normally resort to aid in the form of liquidity support, such as a loan or guarantee, rather than a grant. Where it is also necessary to provide the firm with a certain degree of risk sharing, a repayable advance should normally be the aid instrument of choice. In particular, where aid is awarded in a form other than liquidity support or a repayable advance for activities that are close to the market, Member States must justify the appropriateness of the chosen instrument for tackling the specific market failure in question. For aid schemes implementing the objectives and priorities of Operational Programmes, the financing instrument chosen in those programmes is in principle presumed to be an appropriate instrument.

3.2.3 Proportionality of the aid

3.2.3.1. General conditions

77. For any R&D&I aid to be considered proportional, its amount must be limited to the minimum needed for carrying out the aided activity.^{3.2.3.1.1. Maximum aid intensities}
78. In order to ensure that the level of aid is proportionate to the market failures which it is intended to address hindering the implementation of the RDI activities to be triggered by the aid measure in question, the aid must be determined in relation to a predefined set of eligible costs and limited to a certain proportion of those eligible costs ('aid intensity'). The aid intensity must be established for each beneficiary of aid, including in a collaboration project.
79. To ensure predictability and a level playing field, the Commission applies maximum aid intensities for R&D&I aid, which are established on the basis of three criteria: (i) the closeness of the aid to the market, as a proxy for its expected negative effects and the need for it, taking into account the potential higher revenues that can be expected from the aided activities; (ii) the size of the beneficiary as a proxy for the more acute difficulties generally faced by smaller undertakings to finance a risky project; and (iii) the acuteness of any market failure, such as the expected externalities in terms of dissemination of knowledge. Therefore, aid intensities should generally be lower for activities linked to development and innovation than for research activities. These considerations apply similarly to the aid intensity for aid for technology infrastructures, which, by definition, would provide mainly services to users for R&D activities closer to the market in comparison to the R&D activities habitually performed by research infrastructures.
80. The eligible costs for each aid measure covered by this framework are set out in Annex I. When an R&D project encompasses different tasks, each eligible task must fall under the categories of fundamental research, industrial research or experimental development⁵¹. When classifying different activities according to the relevant

⁵¹ This qualification does not necessarily need to follow a chronological approach, moving sequentially over time from fundamental research to activities closer to the market. Accordingly, nothing will prevent the Commission from classifying a task, which is carried out at a later stage of a project as industrial research, while finding that an activity carried out at an earlier stage constitutes experimental development or is not research at all.

category⁵², the Commission will refer to its own practice as well as to the specific examples and explanations provided in the OECD Frascati Manual⁵³.

81. The eligible costs shall be supported by the most recently available documentary evidence which shall be clear and specific. Indirect R&D project costs may also be calculated on the basis of a simplified cost approach in the form of a flat-rate of up to 15%, applied to total eligible direct R&D project costs. In the latter case, both categories of direct and indirect costs should be established on the basis of normal accounting practices, must comprise only eligible R&D project costs listed in Annex I, and must be duly justified.
82. The maximum aid intensities generally applicable to all eligible R&D&I measures are set out in Annex II⁵⁴.
83. In the case of State aid for a project being carried out in collaboration between research organisations and undertakings, the combination of direct public support and, where they constitute aid, contributions from research organisations to the same project must not exceed the applicable aid intensities for each beneficiary undertaking.

3.2.3.1.2. *Repayable advances*

84. If a Member State awards a repayable advance which qualifies as State aid within the meaning of Article 107(1) of the Treaty, the rules laid down in this section apply.
85. Where a Member State can demonstrate, on the basis of a valid methodology based on sufficient verifiable data, that it is possible to calculate the gross grant equivalent of a repayable advance, it may notify an aid scheme and the associated methodology to the Commission. If the Commission accepts the methodology and deems the scheme compatible, the aid may be awarded on the basis of the gross grant equivalent of the repayable advance, up to the aid intensities laid down in Annex II.
86. In all other cases, the repayable advance is expressed as a percentage of the eligible costs and may exceed the applicable maximum aid intensities by 10 percentage points, provided that the following conditions are fulfilled:
 - (a) in case of a successful outcome, the measure must provide that the advance is to be repaid with an interest rate not less than the discount rate resulting from the application of the Communication from the Commission on the revision of the method for setting the reference and discount rates⁵⁵;
 - (b) in case of a success exceeding the outcome defined as successful, the Member State concerned should request payments beyond repayment of the advance amount including interest according to the applicable discount rate;

⁵² For practical purposes and unless it is shown that a different scale should be used in individual cases, the different R&D categories can also be considered to correspond to Technology Readiness Levels 1 (fundamental research), 2-4 (industrial research) and 5-8 (experimental development) – see Communication from the Commission, ‘A European strategy for Key Enabling Technologies – A bridge to growth and jobs”, COM(2012) 341 final, 26.6.2012.

⁵³ OECD Frascati Manual 2015, OECD: Guidelines for Collecting and Reporting Data on Research and Experimental Development, as amended or replaced.

⁵⁴ Without prejudice to specific provisions applying to aid for research and development in the agricultural and fisheries sectors, as laid down in a block exemption Regulation.

⁵⁵ Communication from the Commission on the revision of the method for setting the reference and discount rates, OJ C 14, 19.1.2008, p. 6.

- (c) in case the project fails, the advance does not have to be fully repaid. In case of partial success, the repayment should be proportional to the degree of success achieved.
87. For the Commission to assess the measure, it must include detailed provisions on the repayment in case of success, which clearly define what will be considered as a successful outcome, on the basis of reasonable and prudent hypothesis.
- 3.2.3.1.3. *Fiscal measures*
88. To the extent it constitutes State aid, the aid intensity of a fiscal measure can be calculated either on the basis of individual projects or, at the level of an undertaking, as the ratio between the overall tax relief and the sum of all eligible R&D&I costs incurred in a period not exceeding three consecutive fiscal years. In the latter case, the fiscal measure may apply without distinction to all eligible activities, but must not exceed the applicable aid intensity for experimental development⁵⁶.
- 3.2.3.1.4. *Cumulation of aid*
89. Aid may be awarded concurrently under several aid schemes or cumulated with *ad hoc* aid, provided that the total amount of State aid for an activity or project does not exceed the aid ceilings laid down in this framework. As noted in point 11, Union funding centrally managed by the institutions, agencies, joint undertakings or other bodies of the Union that is not directly or indirectly under the control of Member States does not constitute State aid and should not be taken into account. Where such Union funding is combined with State aid, the total amount of public funding awarded in relation to the same eligible costs must however not exceed the most favourable funding rate laid down in the applicable rules of Union law.
90. Where the expenditure eligible for R&D&I aid is also potentially eligible in whole or in part for aid for other purposes, the overlapping portion will be subject to the most favourable ceiling under any of the relevant rules.
91. Aid for R&D&I may not be cumulated with *de minimis* support in respect of the same eligible costs if that would result in an aid intensity exceeding those laid down in this framework.
- 3.2.3.2. *Additional conditions for individual aid*
92. For notifiable individual aid, mere compliance with a set of predefined maximum aid intensities is not sufficient to ensure proportionality.
93. As a general rule, and in order to establish whether the aid is proportional, the Commission will verify that its amount does not exceed the minimum necessary for the aided project to be sufficiently profitable, for example by making possible to achieve an IRR corresponding to the sector or firm specific benchmark or hurdle rate. Normal rates of return required by the beneficiary in other R&D&I projects, its cost of capital as a whole or returns commonly observed in the industry concerned may also be used for this purpose. All relevant expected costs and benefits must be considered over the lifetime of the project, including the costs and revenues stemming from the results of R&D&I activities.

⁵⁶ Conversely, where a fiscal aid measure distinguishes between different R&D categories, the relevant aid intensities must not be exceeded.

94. Where it is shown, for example by means of internal company documents, that the aid beneficiary faces a clear choice between carrying out either an aided project or an alternative one without aid, the aid will be considered to be limited to the minimum only if its amount does not exceed the net extra costs of implementing the activities concerned, compared to the counterfactual project that would be carried out in the absence of aid. In order to establish the net extra costs, the Commission will compare the expected net present values of the investment in the aided project and the counterfactual project, account being taken of the probabilities of different business scenarios occurring⁵⁷.
95. Where aid is awarded for R&D projects or for the construction or upgrade of research infrastructures or for the construction or upgrade of technology infrastructures and the Commission can establish, on the basis of the methodology laid down in points 94 or 95, that the aid is strictly limited to the minimum necessary, higher maximum aid intensities than those laid down in Annex II may be allowed, up to the levels set out in the following table:

	Small enterprise	Medium-sized enterprise	Large enterprise
Aid for R&D projects			
Fundamental research	100 %	100 %	100 %
Applied research	80 %	70 %	60 %
- subject to effective collaboration between undertakings (for large enterprises cross-border or with at least one SME) or between an undertaking and a research organisation; or - subject to wide dissemination of results	90 %	80 %	70 %
Aid for the construction and upgrade of research infrastructures	60 %		
Aid for the construction and upgrade of technology infrastructures	[35%]		
- Subject to at least two Member States providing the public funding, or - Subject to the technology infrastructure providing services predominantly to SMEs (at least allocating 80% of its capacity for that purpose)	[40%]		

⁵⁷ In the particular case where aid merely allows for an increase in the speed of completion of the project, the comparison should mostly reflect the different timelines in terms of cash flows and delayed entry in the market.

96. In order to demonstrate that aid is limited to the minimum necessary, Member States must explain how the aid amount has been established. Documentation and calculations used for the analysis of the incentive effect can also be used to assess whether the aid is proportionate. Insofar as the identified need for aid relates mainly to difficulties in attracting debt finance from the market, rather than to a lack of profitability, a particularly apt way to ensure that the aid is kept to the minimum may be to provide it in the form of a loan, guarantee or repayable advance instead of a non-repayable form, such as a grant.
97. Where there are multiple potential candidates for carrying out the aided activity, the proportionality requirement is more likely to be met if the aid is awarded on the basis of transparent, objective and non-discriminatory criteria.
98. In order to address actual or potential direct or indirect distortions of international trade, higher intensities than generally permissible under this framework may be authorised if, directly or indirectly, competitors located outside the Union have received in the last three years or are going to receive aid of an equivalent intensity for similar projects. However, where distortions of international trade are likely to occur after more than three years, given the particular nature of the sector in question, the reference period may be extended accordingly. Where possible, the Member State concerned must provide the Commission with sufficient information to enable it to assess the situation, in particular the need to take account of the competitive advantage enjoyed by a third country competitor. Where the Commission does not have evidence concerning the awarded or proposed aid, it may also base its decision on circumstantial evidence.
99. When gathering evidence, the Commission may use its investigative powers⁵⁸.

3.2.4 Transparency

100. As a further safeguard against undue distortions, Member States, the Commission, economic operators, and the public, must have easy access to all relevant acts and to pertinent information about the aid awarded thereunder.
101. With the exception of individual aid awards below EUR 100,000, Member States must publish on a comprehensive State aid website, at national or regional level, at least the following information on notified State aid measures: the full text of the aid scheme and its implementing provisions or legal basis for individual aid, or a link to it; the identity of the aid awarding authority; the identity of individual beneficiaries; the form and amount of aid awarded to each beneficiary; the date of award; the type of beneficiary (SME or large enterprise); the region in which the beneficiary is located (at NUTS level II); and the principal economic sector in which the beneficiary has its activities (at NACE group level)⁵⁹. Such information must be published within six months after the awarding decision has been taken or, for fiscal measures, within one year from the date

⁵⁸ See Article 1(3) of Council Regulation (EU) No 734/2013 of 22 July 2013 amending Regulation (EC) No 659/1999 laying down detailed rules for the application of Article 93 of the EC Treaty, OJ L 204, 31.7.2013, p. 15.

⁵⁹ With the exception of business secrets and other confidential information in duly justified cases and subject to the Commission's agreement (Communication from the Commission on professional secrecy in State aid decisions, C(2003) 4582 final, OJ C 297, 9.12.2003, p. 6). For fiscal measures, the information on individual aid amounts can be provided in the following ranges (in EUR million): [0.5-1]; [1-2]; [2-5]; [5-10]; [10-30]; [30 and more].

of the tax declaration, must be kept for at least ten years and must be available to the general public without restrictions⁶⁰.

3.2.5 Verifying that specific negative effects of R&D&I aid on competition and trading conditions are minimized or avoided

3.2.5.1 General considerations

102. The Commission will identify the markets that are affected by the aid, taking into account the information provided by the Member State on the product markets concerned, that is to say the markets affected by the change in behaviour of the aid beneficiary. To the extent that a specific innovative R&D&I activity will be associated with multiple future product markets, the impact of State aid will be considered on the set of markets concerned. The Commission will also identify the affected geographic market, which corresponds to the area in which the undertakings of affected product markets operate, and for which competition conditions are sufficiently homogeneous and clearly can be distinguished from those of neighbouring areas.
103. The Commission will further assess the distortions of competition based on the foreseeable impact of the R&D&I aid on competition between undertakings in the product and geographic markets concerned⁶¹, that are likely to be negatively affected by the aid, taking also into account the information provided by the Member States on the competitors and customers or consumers affected. In doing so, where appropriate, the Commission may also identify the competitive interactions (substitutes, complements, including also upstream or downstream) where the distortions caused by an aid measure are more likely to occur.
104. The aid allows the aid beneficiary, typically, to gain competitive advantage through i) reduced production costs, or ii) increased production capacity, or iii) new product development. The Commission considers that the negative effects of the aid will first operate on competitors. For that reason, the Commission should focus at first place on identifying the aid beneficiary's actual or potential competitors that are likely to be negatively affected by the aid.
105. The Commission identifies two main potential distortions of competition and trade between Member States caused by R&D&I aid, namely product market distortions and location effects. Both types may lead to allocative inefficiencies, undermining the economic performance of the internal market, and distributional concerns, in that the aid affects the distribution of economic activity across regions.
106. As far as distortions on the product markets are concerned, State aid for R&D&I may have an impact on competition in innovation processes and in the product markets where the results of the R&D&I activities are exploited.

⁶⁰ In case of unlawful aid, Member States will be required to ensure the *ex post* publication of the same information, at the latest six months after the date of the Commission decision. This information should be available in a format, which allows data to be searched, extracted, and easily published on the internet, for instance in CSV or XML format.

⁶¹ This analysis may address, where relevant, both input and output markets.

3.2.5.1.1. *Effects on product markets*

107. State aid for R&D&I can hamper competition in innovation processes and product markets in three ways, namely by distorting the competitive entry and exit process, by distorting dynamic investment incentives and by creating or maintaining market power.

(i) Distorting the competitive entry and exit processes

108. R&D&I aid may prevent the market mechanism from rewarding the most efficient producers and putting pressure on the least efficient to improve, restructure or exit the market. That might lead to a situation where, due to the aid awarded, competitors that would otherwise be able to stay on are forced out of the market, or never enter in the first place. Similarly, State aid can prevent inefficient firms from leaving the market or even induce them to enter and gain market shares from otherwise more efficient competitors. If not correctly targeted, R&D&I aid may therefore support inefficient undertakings and lead to market structures in which many players operate significantly below efficient scale. In the long run, interfering with the competitive entry and exit processes may stifle innovation and slow down industry-wide productivity improvements.

(ii) Distorting dynamic incentives

109. R&D&I aid may distort the dynamic incentives to invest of competitors of the aid beneficiary. When an undertaking receives aid, the likelihood of successful R&D&I activities on its part generally increases, leading to an increased presence on the relevant product market(s) in the future. That increased presence may lead competitors to reduce the scope of their original investment plans (crowding out effect).

110. Furthermore, the presence of aid may make potential beneficiaries complacent or more risk seeking. The long term effect on the overall performance of the sector is in that case likely to be negative. R&D&I aid may therefore, if not correctly targeted, support inefficient undertakings and lead to market structures where many market players operate significantly below efficient scale.

(iii) Creating or maintaining market power

111. Aid for R&D&I may also have distortive effects in terms of increasing or maintaining the degree of market power in product markets. Market power is the power to influence market prices, output, the variety or quality of products and services, or other parameters of competition for a significant period of time, to the detriment of consumers. Even where aid does not strengthen market power directly, it may do so indirectly, by discouraging the expansion of existing competitors or inducing their exit or discouraging the entry of new competitors.

3.2.5.1.2. *Effects on trade and location choice*

112. State aid for R&D&I may also give rise to distortions of competition when it influences the choice of a location. Those distortions can arise across Member States, either when firms compete across borders or consider different locations. Aid aimed at relocating an activity in another region within the internal market may not lead directly to a distortion in the product market, but it displaces activities or investments from one region into another.

3.2.5.1.3. *Manifest negative effects*

113. In principle, an aid measure and the context in which it is applied need to be analysed to identify the extent to which it can be deemed distortive. However, certain situations can be identified where the negative effects manifestly outweigh any positive effects, meaning that aid cannot be found to be compatible with the internal market.
114. In particular, according to the general principles of the Treaty, State aid cannot be considered compatible with the internal market if the aid measure is discriminatory to an extent not justified by its State aid character. As explained in section 3.1.3, the Commission will thus not allow any measure where such measure or the conditions attached to it entail a violation of relevant Union law. This is particularly the case for aid measures where the award of aid is subject to the obligation for the beneficiary to have its central seat in the relevant Member State (or to be predominantly established in that Member State) or to use national products or services, as well as for aid measures restricting the possibility for the beneficiary to exploit the R&D&I results in other Member States.

3.2.5.2 **Aid schemes**

115. In order to be compatible with the internal market, notifiable aid schemes must not lead to significant distortions of competition and trade. In particular, even where distortions may be considered limited at individual level (provided the aid is necessary and proportional to achieve the common objective), on a cumulative basis aid schemes might still lead to high levels of distortions. Such distortions may for instance result from aid that negatively affects dynamic incentives to innovate on the part of competitors. In the case of a scheme focusing on certain sectors, the risk of that kind of distortions is even more pronounced.
116. Without prejudice to point 145, Member States therefore must demonstrate that any negative effects will be limited to the minimum taking into account, for example, the size of the projects concerned, the individual and cumulative aid amounts, the number of expected beneficiaries as well as the characteristics of the targeted sectors. In order to enable the Commission to assess the likely negative effects of notifiable aid schemes, Member States may submit any impact assessment as well as *ex post* evaluations carried out for similar predecessor schemes.

3.2.5.3. **Additional conditions for individual aid**

3.2.5.3.1 Distortions in product markets

117. For notifiable individual aid, in order to enable the Commission to identify and assess potential distortions of competition and trade, Member States should provide information on (i) the product markets concerned, that is to say the markets affected by the change in behaviour of the aid beneficiary, and (ii) the competitors and customers or consumers affected.
118. In assessing the negative effects of the aid measure, the Commission will focus its analysis of the distortions of competition on the foreseeable impact of the R&D&I aid on competition between undertakings in the product markets concerned. The Commission will give more weight to risks for competition and trade that arise in the near future and with particular likelihood.

119. To the extent that a specific innovative activity will be associated with multiple future product markets, the impact of State aid will be considered on the set of markets concerned. In certain cases the results of R&D&I activities, for example in the form of IPR, are themselves traded in technology markets, for instance through patent licensing or trading. In those cases, the Commission may also consider the effect of the aid on competition in technology markets.
120. The Commission will use various criteria to assess the potential distortions of competition, namely distorting dynamic incentives, creating or maintaining market power, and maintaining inefficient market structures.
- (i) Distorting dynamic incentives*
121. In its analysis of the potential distortion of dynamic incentives, the Commission will consider the following elements:
- (i) *Market growth*: the more the market is expected to grow in the future, the less likely that the competitors' incentives will be negatively affected by the aid, given that there remain ample opportunities to develop a profitable business;
 - (ii) *Aid amount*: aid measures which involve significant amounts of aid are more likely to lead to significant crowding out effects. The significance of the aid amount will be measured mainly with reference to the amount spent by the main market players on projects of a similar kind;
 - (iii) *Closeness to the market / category of the aid*: the more the aid measure is aimed at activities close to the market, the more it is liable to develop significant crowding out effects;
 - (iv) *Open selection process*: where the aid is awarded on the basis of transparent, objective and non-discriminatory criteria, the Commission will take a more positive stance;
 - (v) *Exit barriers*: competitors are more likely to maintain, or even to increase their investment plans when exit barriers to the innovation process are high. That may be the case when many of the competitors' past investments are locked in to a particular R&D&I trajectory;
 - (vi) *Incentives to compete for a future market*: R&D&I aid may lead to a situation where competitors of the aid beneficiary renounce competing for a future "winner takes all" market, because the advantage provided by the aid, in terms of degree of technological advance, economies of scale, network effects or timing, reduces their possibility to potentially successfully enter that future market;
 - (vii) *Product differentiation and intensity of competition*: where product innovation is rather about developing differentiated products, related for example to distinct brands, standards, technologies or consumer groups, competitors are less likely to be affected. The same situation arises where there are many effective competitors in the market.
- (ii) Creating or maintaining market power*
122. The Commission is concerned mainly about those R&D&I measures which enable the aid beneficiary to strengthen market power held on existing product markets or to transfer it to future product markets. The Commission is therefore unlikely to identify

competition concerns related to market power in cases where the aid beneficiary has a market share below 25% and in markets with a market concentration below 2000 on the Herfindahl-Hirschman Index (HHI).

123. In its analysis of market power, the Commission will consider the following elements:
- (i) *Market power of the aid beneficiary and market structure*: where the aid recipient is already dominant on a product market, the aid measure may reinforce that dominance by further weakening the competitive constraint that competitors can exert on the recipient undertaking. Similarly, State aid measures may have a significant impact in oligopolistic markets where only a few players are active;
 - (ii) *Level of entry barriers*: in the field of R&D&I, there may be significant barriers to entry for new entrants. Those barriers include legal entry barriers (in particular in respect of IPR), economies of scale and scope, access barriers to networks and infrastructure, and other strategic barriers to entry or expansion;
 - (iii) *Buyer power*: the market power of an undertaking may also be limited by the market position of the buyers. The presence of strong buyers can serve to counter a finding of a strong market position if it is likely that the buyers will seek to preserve sufficient competition in the market;
 - (iv) *Selection process*: aid measures which allow undertakings with a strong market position to influence the selection process, for example by having the right to recommend undertakings in the selection process or influencing the research path in a way which disfavours alternative paths on unjustified grounds, are liable to raise concern by the Commission.

(iii) Maintaining inefficient market structures

124. In its analysis of market structures, the Commission will consider whether the aid is awarded in markets featuring overcapacity or in declining industries. However, in situations where the market is growing or where State aid for R&D&I is likely to change the overall growth dynamics or in particular the GHG emissions' footprint of the sector (in accordance with the European Green Deal and European Digital Strategy Communications), notably as a result of introducing new technologies, for example to achieve decarbonisation or the digitalisation of the production, or both, without an increase in capacities, such aid is not likely to raise concerns.

3.2.5.3.2 Location effects

125. In particular where R&D&I aid is close to the market, it may result in some territories benefiting from more favourable conditions in respect of subsequent production, particularly because of comparatively lower production costs as a result of the aid or due to higher levels of R&D&I activities pursued through the aid. That may lead undertakings to re-locate to those territories.
126. Location effects may also be relevant to research infrastructures and technology infrastructures. If aid is mainly used to attract an infrastructure to a particular region at the expense of another, it will not contribute to promoting further R&D&I activities in the Union.
127. In its analysis of notifiable individual aid, the Commission will accordingly take into account any evidence that the aid beneficiary has considered alternative locations.

128. Likewise, aid that merely leads to a change in location of R&D&I activities within the internal market without changing the nature, size or scope of the project will not be considered compatible.

3.2.6 Weighing up the positive and the negative effects of the aid

129. The Commission assesses whether the identified negative effects on competition and trading conditions of the aid measure outweigh the positive effects of the planned aid.

3.2.6.1 Identifying the positive effects to be taken into account

130. There is a correlation between economic growth and R&D&I investment. R&D&I activity increases productivity and boosts economic development. Hence, R&D&I is an important factor for the Union undertakings to ensure economic development by means of developing new products, technologies, services or production processes or both.
131. In a globalised world, investments in R&D&I are of high importance for the development of all sectors of the economy, since they are strongly linked to productivity and competitiveness.
132. As a first step of the balancing test, against this background, the Commission will assess the positive effects of the aid on the aided economic activity, duly taking into account the R&D&I activity which is triggered by the aid measure in question, or the size, scope or speed of the R&D&I project which is to be enhanced by the aid measure.
133. In addition, the Commission may also assess whether the aid brings about wider R&D&I-related positive effects. Where such broader positive effects reflect those embodied in Union policies, such as the new ERA for Research and Innovation, European Green Deal, the European Digital Strategy and the New Industrial Strategy for Europe Communications, then the R&D&I aid aligned with such Union policies can be presumed to have such wider positive effects.
134. The Commission acknowledges that both private and public investments are required to support and speed up R&D&I activities into critical technologies, which when deployed on the market would facilitate the digital transformation of the Union industry and Union's transition to a zero/low-carbon economy, as well as to a circular and zero-pollution one, where natural capital is protected. The Commission takes a favourable view when the R&D&I activities supported by Member States are in accordance with the Regulation (EU) 2020/852 of the European Parliament and of the Council⁶², the latter constituting one of the possible methodologies to identify R&D&I activities for technologies, products or other solutions for environmentally sustainable economic activities.
135. Member States considering awarding State aid for R&D&I, must precisely define the objective pursued, and in particular explain how the measure intends to promote R&D&I. For measures co-financed by the European Structural and Investments Funds, Member States may rely on the reasoning in the relevant Operational Programmes.
136. The Commission takes a favourable view of aid measures which are an integral part of a comprehensive programme or action plan to stimulate R&D&I activities or smart

⁶² Regulation (EU) 2020/852 of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, OJ L 198, 22.6.2020, p. 13.

specialisation strategies, and are supported by rigorous evaluations of similar past aid measures demonstrating their effectiveness.

137. With respect to State aid which is awarded for projects or activities that are also financed by the Union, either directly or indirectly, that is to say by the Commission, by its executive agencies, by joint undertakings established in accordance with Articles 185 and 187 of the Treaty, or by any other implementing bodies where the Union funding is not directly or indirectly under the control of Member States, the Commission will consider that the related positive effects have been established.

3.2.6.1.1. Additional considerations for individual aid

138. In order to demonstrate that individual aid subject to the notification obligation ('notifiable individual aid') contributes to an increased level of R&D&I activities, Member States may use the following indicators, together with other relevant quantitative or qualitative elements:

(a) *increase in project size*: increase in the total project costs (without a decrease in spending by the aid beneficiary when compared to the situation without aid); increase in the number of people assigned to R&D&I activities;

(b) *increase in scope*: increase in the number of the expected deliverables of the project; increase in the level of ambition of the project evidenced by a higher number of partners involved; increase in cross-border R&D&I activities; a higher probability of a scientific or technological break-through or a higher risk of failure (notably linked to the long-term nature of the project and uncertainty about its results);

(c) *increase in speed*: the completion of the project requires less time when compared to the completion time necessary for the same project carried out without aid;

(d) *increase in total amount spent*: increase in total R&D&I spending by the aid beneficiary, in absolute terms or as a proportion of turnover; changes in the committed budget for the project (without a corresponding decrease in the budget allocated to other projects).

139. In order to conclude that the aid contributes to increasing the level of R&D&I in the Union, the Commission will consider not only the net increase of R&D&I carried out by the undertaking, but also the contribution of the aid to the overall increase of R&D&I spending in the sector concerned, the increase in cross-border R&D&I activities within the Union, as well as to the improvement of the Union situation with regard to R&D&I in the international context. A favourable view will be taken regarding aid measures, for which a publicly available ex post evaluation of their positive effects is envisaged.

3.2.6.2. Balancing of the positive effects against the negative effects of the aid

140. Finally, the Commission will balance the identified negative effects of the aid measure in terms of distortions of competition and impact on trade between Member States (see section 3.2.1 to 3.2.5) against the positive effects of the planned aid (see section 3.2.6.1) for the development of the economic activities and the Union's economy or society, or both, and conclude on the compatibility of the aid measure with the internal market only where the positive effects outweigh the negative ones.

141. In cases where the proposed aid measure does not address a well-identified market failure in an appropriate and proportionate way, the negative distortive effects on

competition will tend to outweigh the positive effects of the measure hence the Commission is likely to conclude that the proposed aid measure is incompatible.

142. The overall balance of certain categories of aid schemes may further be made subject to a requirement of *ex post* evaluation referred to in Section 4. In such cases, the Commission may limit the duration of those schemes to four years or less with a possibility of re-notifying their prolongation afterwards.

4. EVALUATION

143. In order to further ensure that distortions of competition and trade are limited, the Commission may require that notifiable aid schemes be subject to a time limitation and to the evaluation referred to in point 142. Evaluations should in particular be carried out for schemes where the potential distortions are particularly high, that is to say schemes that may risk to significantly restrict competition if their implementation is not reviewed in due time.

144. Given its objectives and in order not to put a disproportionate burden on Member States and on smaller aid measures, the requirement referred to in point 143 will apply only for aid schemes with large budgets, containing novel characteristics or when significant market, technology or regulatory changes are foreseen. The evaluation must be carried out by an expert independent from the aid awarding authority on the basis of a common methodology provided by the Commission⁶³ and must be made public. Member States must notify, together with the relevant aid scheme, a draft evaluation plan, which will be an integral part of the Commission assessment of the scheme.

145. In the case of aid schemes excluded from the scope of a block exemption Regulation exclusively on the grounds of their large budget, the Commission will assess their compatibility solely on the basis of the evaluation plan.

146. The evaluation must be submitted to the Commission in due time to allow for the assessment of the possible prolongation of the aid scheme and in any case upon its expiry. The precise scope and modalities of each evaluation will be defined in the decision approving the aid scheme. Any subsequent aid measure with a similar objective, including any alteration of aid schemes referred to in point 145, must take into account the results of the evaluation.

5. REPORTING AND MONITORING

147. In accordance with Council Regulation (EC) No 659/1999⁶⁴ and Commission Regulation (EC) No 794/2004⁶⁵ Member States must submit annual reports to the Commission.

⁶³ See the separate Commission Staff Working Document, 'Common methodology for State aid evaluation', SWD(2014) 179 final, 28.5.2014.

⁶⁴ Council Regulation (EC) No 659/1999 of 22 March 1999 laying down detailed rules for the application of Article 93 of the EC Treaty, OJ L 83, 27.3.1999, p. 1.

⁶⁵ Commission Regulation (EC) No 794/2004 of 21 April 2004 implementing Council Regulation (EC) No 659/1999 laying down detailed rules for the application of Article 93 of the EC Treaty, OJ L 140, 30.4.2004, p. 1.

148. Member States must maintain detailed records regarding all aid measures. Such records must contain all information necessary to establish that the conditions regarding eligible costs and maximum aid intensities have been fulfilled. Those records must be maintained for ten years from the date of award of the aid and must be provided to the Commission upon request.

6. APPLICABILITY

149. The Commission will follow the principles and guidelines set out in this Communication for the compatibility assessment of all notified R&D&I aid in respect of which it is called upon to take a decision after [to be inserted at a later stage]. Unlawful R&D&I aid will be assessed in accordance with the rules applicable on the date on which the aid was awarded.
150. Pursuant to Article 108(1) of the Treaty, the Commission proposes that Member States amend, where necessary, their existing R&D&I aid schemes to ensure compliance with this framework no later than [to be inserted at a later stage].
151. Member States are invited to give their explicit unconditional agreement to the appropriate measures referred to in point 150 within two months from the date of publication of this framework in the *Official Journal of the European Union*. In the absence of a reply from any of the Member States, the Commission will consider that the Member State in question does not agree with the proposed measures.

7. REVISION

152. The Commission may decide to review or amend this framework at any time should it be necessary for reasons associated with competition policy or in order to take account of other Union policies and international commitments or for any other justified reason.

ANNEX I
ELIGIBLE COSTS

Aid for R&D projects	<p>(a) Personnel costs: researchers, technicians and other supporting staff to the extent employed on the project.</p> <p>(b) Costs of instruments and equipment to the extent and for the period used for the project. If such instruments and equipment are not used for their full life for the project, only the depreciation costs corresponding to the life of the project, as calculated on the basis of good accounting practice, are considered as eligible;</p> <p>(c) Costs of buildings and land, to the extent and for the period used for the project. With regard to buildings, only the depreciation costs corresponding to the life of the project, as calculated on the basis of good accounting practice are considered as eligible. For land, costs of commercial transfer or actually incurred capital costs are eligible;</p> <p>(d) Cost of contractual research, knowledge and patents bought or licensed from outside sources at arm's length conditions, as well as costs of consultancy and equivalent services used exclusively for the project;</p> <p>(e) Additional overheads incurred directly as a result of the project;</p> <p>(f) Other operating expenses, including costs of materials, supplies and similar products incurred directly as a result of the project.</p>
Aid for feasibility studies	Costs of study.
Aid for the construction and upgrade of research infrastructures	Investment costs in intangible and tangible assets.
Aid for the construction and upgrade of technology infrastructure	Investment costs in intangible and tangible assets
Innovation aid for SMEs	(a) Costs for obtaining, validating and defending patents and other intangible assets;

	<p>(b) Costs for secondment of highly qualified personnel from a research and knowledge dissemination organisation or a large enterprise, working on R&D&I activities in a newly created function within the beneficiary and not replacing other personnel;</p> <p>(c) Costs for innovation advisory and support services.</p>
Aid for process and organisational innovation	<p>Personnel costs; costs of instruments, equipment, buildings and land to the extent and for the period used for the project; costs of contractual research, knowledge and patents bought or licensed from outside sources at arm's length conditions; additional overheads; other operating costs, including costs of materials, supplies and similar products, incurred directly as a result of the project.</p>
Aid for innovation clusters	
Investment aid	<p>Investment costs in tangible and intangible assets.</p>
Operating aid	<p>Personnel and administrative costs (including overhead costs) relating to:</p> <p>(a) animation of the cluster to facilitate collaboration, information sharing and the provision or channelling of specialised and customised business support services;</p> <p>(b) marketing of the cluster to increase participation of new undertakings or organisations and to increase visibility;</p> <p>(c) management of the cluster's facilities;</p> <p>(d) organisation of training programmes, workshops and conferences to support knowledge sharing and networking and transnational cooperation.</p>

ANNEX II
MAXIMUM AID INTENSITIES

	Small enterprise	Medium-sized enterprise	Large enterprise
Aid for R&D projects			
Fundamental research	100 %	100 %	100 %
Industrial research	70 %	60 %	50 %
- subject to effective collaboration between undertakings (for large enterprises, cross-border or with at least one SME) or between an undertaking and a research organisation; or - subject to wide dissemination of results	80 %	75 %	65 %
Experimental development	45 %	35 %	25 %
- subject to effective collaboration between undertakings (for large enterprises, cross-border or with at least one SME) or between an undertaking and a research organisation; or - subject to wide dissemination of results	60 %	50 %	40 %
Aid for feasibility studies	70 %	60 %	50 %
Aid for the construction and upgrade of research infrastructures	50 %	50 %	50 %
Aid for the construction and upgrade of technology infrastructures	25 %	25 %	25 %
Innovation aid for SMEs	50 %	50 %	-
Aid for process and organisational innovation	50 %	50 %	15 %
Aid for innovation clusters			
Investment aid	50 %	50 %	50 %
- in assisted regions fulfilling the conditions of Article 107(3)(c) of the Treaty	55 %	55 %	55 %
- in assisted regions fulfilling the conditions of Article 107(3)(a) of the Treaty	65 %	65 %	65 %
Operating aid	50 %	50 %	50 %

