

Announcement of Opportunity

CEOI Call for proposals for Mission Concept Development Activities for ESA Earth Explorer 11

1 INTRODUCTION

On behalf of the UK Space Agency, the Centre for Earth Observation Instrumentation (CEOI) invites proposals to develop innovative and scientifically excellent EO mission concepts, directed at strengthening the UK response to the ESA Earth Explorer 11 (EE-11) Call for Mission Ideas [RD8].

The CEOI has the objective to realise an excellent, internationally competitive national Earth observation instrument technology research and development programme. It achieves this by building UK academic and industrial capability in EO, and by funding the development of advanced EO instrumentation through a series of Themed and Open Calls.

Brief details of previous CEOI funded projects may be found on the CEOI website (ceoi.ac.uk).

The UK Space Agency funds the CEOI, which is a partnership led by Airbus Defence and Space Ltd with QinetiQ Ltd, University of Leicester and STFC Rutherford Appleton Laboratory.

1.1 Reference Documents

The following documents contain information that is relevant to this Call:

- [RD1] National Space Policy:
<https://www.gov.uk/government/publications/national-space-policy>
- [RD2] National Space Technology Strategy:
<https://connect.innovateuk.org/web/national-space-technology-strategy/overview/>
- [RD3] EC Definition of Small and Medium Enterprises:
https://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en
- [RD4] BEIS Guidance - State aid: general block exemption regulation:
<https://www.gov.uk/government/publications/state-aid-general-block-exemption-regulation>
- [RD5] UK EO Technology Strategy:
<https://www.gov.uk/government/publications/uk-earth-observation-technology-strategy>
- [RD6] RCUK Guidance for Full Economic Costs (FEC) for academic Partners
<https://www.ukri.org/files/legacy/documents/fecfaq-pdf/>
- [RD7] ESA SP-1329 EO Science Strategy:
http://www.esa.int/About_Us/ESA_Publications/ESA_Publications_Monographs/ESA_SP-1329_EO_Science_Strategy
- [RD8] ESA Earth Explorer 11 Call for Mission Ideas
<https://eopro.esa.int/earth-explorer-mission-11-mission-ideas>

2 ESA Call for Earth Explorer-11 Mission Ideas

The overarching goal of ESA's EO Science Strategy [RD7] is "to challenge ESA and the scientific community to strive for major advances in knowledge along with the technological capabilities that are needed to respond to the ever-increasing societal needs associated with risks and opportunities in our changing global environment".

The ESA EE-11 Call [RD8] invites proposals for an Earth Explorer 'Core' mission to be launched in the 2031/32 timeframe. Mission proposals can potentially cover any Earth Science topic relevant to the ESA FutureEO Programme, in accordance with the Earth Observation Science Strategy for ESA. Proposals must demonstrate scientific excellence and innovative technologies by employing novel approaches to provide new scientific insights. Mission candidates will be selected by ESA from the proposed ideas on the basis of their innovation and scientific excellence.

Evidence must be provided in the proposal to ESA that a Science Readiness Level (SRL) of 4 can be achieved by the end of Phase 0, SRL-5 at the end of Phase A, and that a Technology Readiness Level (TRL) of 5 can be achieved by the end of phase B1¹.

The cost at completion (CaC) of the mission should not exceed 450 M€ (e.c. 2020), with a target of 250 M€ (e.c. 2020) for all industrial development costs for the space segment.

The full compliance requirements for the ESA EE-11 opportunity are contained in the ESA Call for Mission Ideas [RD8], which was issued on 25th May 2020, with responses required by 4th December 2020.

3 Description of the CEOI Call for Proposals

This CEOI Call is aimed at strengthening the response from UK teams to the ESA EE-11 Call, by funding UK activities that will enhance the mission proposal to ESA. The funding should be used to develop and consolidate the scientific and technology teaming and strengthen the arguments that the mission meets the ESA objectives. The activities should be designed to improve the case for UK-led candidate missions.

Proposals submitted to the CEOI call could include activities to:

- Improve the science credibility of the concept, showing that an SRL of 4 can be achieved by the end of Phase 0 and SRL-5 at the end of Phase A
- Develop a credible mission and satellite design concept, and a high level estimated cost breakdown, which can be supported by industrial verification
- Demonstrate (e.g. by analysis of key mission technology needs and describing in detail a credible plan of technology development) that all mission critical technologies can achieve TRL-5 by the end of the ESA Phase B1

The CEOI proposal should make provision for an EE-11 'proposal readiness review' by an independent panel of UK experts to be appointed by CEOI/UKSA. The review objective will be

¹ ESA provide links to SRL and TRL definition documents in the EE-11 Call web page [RD8]

to provide constructive feedback to a near-final draft of the EE-11 mission proposal, which should preferably take place in the week 2nd - 6th November 2020.

The CEOI project would be expected to be substantially complete by mid-November 2020, so that the outputs can be exploited to improve the response to the ESA EE-11 Call.

All proposals into this CEOI Call should be led by a UK PI or member of the core science team in the UK who intends to submit a proposal into the ESA EE-11 Mission Call².

The maximum duration and grant is shown in Table 3-1.

Proposal element	Maximum Duration	Maximum CEOI Grant
Mission Concept Development	4 months	£50K

Table 3-1 Grant Level and Project Duration

This CEOI Call is released on 24th July 2020, with a closing date of **14th August 2020 at noon**. It is anticipated that proposal selection will be conducted promptly, so that CEOI projects can start in September.

Eligible activities include Feasibility Studies and Industrial Research³. Activities categorised as Fundamental Research or Experimental Development are not eligible.

Additional PV funds may be required from any industrial Partners, as defined by State Aid General Block Exemption Regulation [RD4]. Where industrial support has the nature of a consultancy to the PI or Core Science Team member (rather than as a project Partner activity involving technology development that results in shared IP), CEOI will accept that the activity can be a direct procurement in this CEOI Call.

The CEOI Call is open to industry, HEIs and other research organisations based in the UK. Proposals from collaborative teams are strongly encouraged. Section 12 (Table 1 and Note 1) define eligible collaborations and the PV concessions available for collaborative activities.

The CEOI will only award grants to proposals judged to be of sufficient quality. The CEOI reserves the right to re-issue the Call in a revised form if all allocated funds are not utilised.

We welcome enquiries from potential bidders for clarification of any aspect of the Call.

² See note in Section 8

³ These are the definitions of R&D activities that are used by the European Commission to determine the maximum allowable intervention rates mandated by State Aid regulations. See Section 12 and [RD4] for more details.

4 GUIDELINES FOR PREPARING AN APPLICATION

Applications should take the form of a proposal in single-spaced typescript (minimum font size 12 point Times New Roman, minimum 1.5 cm margins all round, including diagrams and tables).

All Sections defined in Table 4-1 should be supplied in the proposal.

Section (%) indicates weighting of proposal assessment marks	Details in Section:	Page count (max)
Letter of Offer	4.1	1 page
including Application Form	11	1 page
Main Proposal Document		
1. Summary of Proposed CEOI Project	0	1 page including picture or diagram
2. Overview and Description of Proposed ESA Mission (40%)	4.3	3 pages
3. Mission Concept Development Activities Proposed in CEOI Project (40%)	4.4	3 pages
4. Management and Financial proposal, plus Excel Finance Table (20%)	4.5 4.6	- 4 pages (template available on request), - completed CEOI spreadsheet (Summary Sheet and one Sheet per Partner)
Annexes		
Annex 1 Company and organisation background	4.7	1 page per organisation (Only required from organisations not already known to CEOI)
Annex 2 Eligibility information	8	1 page plus any appended information (Only required from organisations not already known to CEOI)
Annex 3 CVs (for all key team members)	-	1 page each
Annex 4 Work Package descriptions (up to 5)	-	1 page each (template available on request)

Table 4-1 Application Checklist

Proposals not including all of the mandated Sections or not conforming to the page count limit may be rejected.

Bidders should note that the Agency, University of Leicester or CEOI will not refund any costs associated with preparing proposals responding to the CEOI Call.

4.1 The Letter of Offer

To ensure ease and speed of placing the contract following selection, the bids must include a covering letter⁴ containing:

- A committing offer to University of Leicester, who will contractually administer the CEOI grants on behalf of the Agency and CEOI.
- A statement of acceptance of the standard CEOI Terms and Conditions (T&Cs). A copy of these T&Cs is available on the CEOI website. Bidders should note that these T&Cs will not be open to negotiation.
- The completed Application Form

The Main Proposal Document

4.2 Summary of the Proposed CEOI Project

The project summary should provide a brief overall description of the CEOI project (including but not limited to an outline of the proposed mission) in a form suitable for publication should the project be funded. Publication can be delayed until after 4th December 2020 if requested.

4.3 Overview and Description of Proposed ESA Mission

This section could include first drafts of the equivalent section(s) (e.g. the Executive Summary) of the ESA proposal. It should identify the science and societal benefits which will be offered by the mission, justifying the need for improved measurements, the links to the ESA EO Science Strategy [RD7] and how the mission will address the ESA strategic science goals and challenges.

It should outline the scientific objectives, the mission requirements in terms of the geophysical parameters to be retrieved, the target accuracy and the relevant spatial and temporal sampling scales and the overall justification for the mission requirements. It should also identify the uniqueness and complementarity compared to existing and planned missions;

An indication of the likely core European science team for the ESA Mission proposal should be provided.

The section should also provide an outline of the envisaged mission implementation concept, addressing the required observation concepts and the associated main requirements, together with the main elements of the mission idea. All aspects of the mission should be considered, even where not the focus of the proposed study, to explain the overall status of the mission proposal and allow assessment of its likely success.

The innovative aspects of the mission and the possible contribution to the advancement of UK EO technological, data and service capabilities should be identified.

Proposers should note that the ESA EO Science Strategy stresses the dual importance of scientific innovation and societal impact.

⁴ Applicants should note that the University of Leicester will be administering the grant funding and hence the letter with the committing offer should be addressed to the University.

4.4 Mission Concept Development Activities

This section should describe the proposed Mission Concept Development activities to be undertaken with the CEOI Grant. It should contain:

- A description of the activities in the proposed study, and how they will strengthen the ESA Call response, particularly in terms of:
 - Improving the science credibility of the concept and showing that an SRL of 4 can be achieved by the end of Phase 0, and SRL-5 at the end of Phase A
 - Demonstrating a credible mission concept, satellite design concept, and high level estimated cost breakdown
 - Demonstrating that all mission critical technologies will achieve TRL-5 by the end of the ESA Phase B1
- A preliminary assessment of the current status of the SRL and TRL of critical items for the proposed mission with brief justification
- A description of how the funding will develop and consolidate the scientific and technology teaming in the UK.

4.5 Management and Financial Proposal

The management and financial section of the proposal should contain

- A project plan, including a summary of the work, a project schedule (including the external review) and a work break down structure. Work package descriptions should be attached as an Annex.
- A clear identification of which institutions, industrial organisations and individuals are project Partners, which functions they will be performing and justification of the resources requested.
- A list of the key individuals and their position in the project team.
- A clear description of any support/consultancy to be procured from industry (who, what will they do and the cost) and how this will be managed. Note: an industry or other organisation from whom support/consultancy is *procured* should not be listed as a Partner to the project.
- A financial summary table with the major items of expenditure by each Partner (staff, travel, external contracts, procurements etc).
- The payment milestone plan, in the format defined in Section 5.1
- A costed travel plan.
- A clear statement of any Private Venture (PV) investment offered, and its relationship to the State Aid mandatory limits under GBER exclusions (see #5.2 and #12);

4.6 Finance Table

The CEOI Finance Table must be completed, using one worksheet (P1-P8 in the Excel spreadsheet) for each Partner.

Any industrial support/consultancy to be procured should be itemised in the 'Direct Costs' section of Sheet P1.

The template is available on the CEOI website.

4.7 Company and organisation background

For each of the project Partners (unless already known to the CEOI) include company/organisation background and relevant track record.

5 CONTRACTUAL INFORMATION

Award(s) will take the form of a contract between University of Leicester and the project's lead organisation. The lead organisation will be expected to place contracts to flow down the Grant finance to its Partners, with terms and conditions similar to the main CEOI Grant contract.

This CEOI activity has been assessed by HMRC as outside the scope of VAT, because no taxable supply to the UK Space Agency or to CEOI is taking place. The IPR will not in the normal course of events pass to the Agency or the CEOI.

All relevant costs, including any taxes on procurements (excluding input VAT reclaimable by the Grant Recipient from HMRC), must be included within the total amount of the grant application. Note that a direct procurement for services from another organisation implies that they are not a Partner.

Bidders should note that Grants cannot be provided to companies or organisations in financial difficulties. Organisations not already known to UK Space Agency or CEOI may be required to provide evidence of company legitimacy and financial solvency supported by e.g. company Annual Reports before any contract award.

5.1 Payment plan

The payment plan should consist of the following payments and deliverables as baseline:

Milestone No.	Description	Planned Date	Payment (%)	Payment (£)
MS1	<ul style="list-style-type: none">• Minutes from KO Meeting• Copy of ESA EE11 letter of intent	25-Sep-2020	20%	
MS2	<ul style="list-style-type: none">• Copy of Submission to ESA EE11 Call• Executive Summary describing the proposed mission (1-2 pages)	11-Dec-2020	80%	

5.2 Grants to Industry - Additional Funding Contribution

Industry in receipt of a CEOI Grant as Project Lead or as a Partner in the team is required to provide a contribution to eligible project costs in accordance with the European State Aid General Block Exemption Regulation (GBER) requirements. Note that EC grants or other funds from public sources are not eligible as additional contributions.

Bidders must identify and justify the category type of the work proposed, and this must be consistent with the work programme. Note that the type of activity and company size defines the maximum 'Intervention' rate (and hence the minimum required contribution level) that is permitted for that activity (see Section 12). There are concessions for collaborative activities.

Bidders must ensure that they supply the correct information that allows CEOI to award grants within the scheme and it is the responsibility of the bidder to ensure compliance with the relevant State Aid legislation. Further guidance is available on the BEIS website [RD4].

5.3 Academic contribution

Academic Partners and Research Organisations will be funded at no more than 80% of Full Economic Cost (FEC).

5.4 Type of Award

The award will be made on a firm fixed price basis.

5.5 Intellectual Property

It is expected that consortium members will declare any Background IP to be brought to the project as part of the establishment of the Contract with University of Leicester. The IP generated during the course of the project will belong to the originators.

5.6 Contractual Pre-conditions

If the project is selected for grant offer, the following conditions must be met before the CEOI will initiate preparation of the contract:

- The company size and GBER category under EU State Aid rules are correctly defined.
- The source and amount of additional funding is fully defined.
- The financial viability of all members of the project consortium and funding sources are established through a due diligence process.
- The consortium is judged by the UK Space Agency to be eligible to receive a Grant from UK government under HM Treasury regulations and under EU State Aid rules.

6 ASSESSMENT OF PROPOSALS

The Review Panel will consist of independent Agency approved reviewers drawn from academia, industry, Government or the Research Council Review Colleges. It will assess the proposals against the Gateway questions and according to the criteria listed below, taking into account the commitment of the organisations, in particular the lead organisation, to the success of the project and the financial viability of all the project Partners.

Gateway Criteria

- That the quality of the overall mission is likely to meet the ESA EO science strategy objectives, including addressing scientific excellence and societal need;
- That there is a reasonable likelihood of success of a proposal to ESA, including strength and maturity of the potential *European* mission proposal team.

Assessment of Mission Concept (40%)

The criteria will assess the strength of the mission concept in relation to the ESA mission selection criteria [RD7] and to UK priorities in relation to ESA:

- Relevance to the ESA research objectives defined in ESA SP-1329 EO Science Strategy, including how the scientific advances anticipated from the mission will contribute to addressing major societal issues;
- Need, usefulness and excellence; the significance of the mission for ESA and the European environmental science community;
- Uniqueness and complementarity compared to existing and planned missions;
- Degree of innovation and contribution to the advancement of UK EO technological, data and service capabilities;

Assessment of Proposed Development Activities (40%)

- Degree to which the proposed development activities will improve the probability of mission selection for Phase 0 study by ESA
- Quality of activity proposed to show that a Science Readiness Level (SRL) of 4 can be achieved by the end of Phase 0, and SRL-5 at the end of Phase A
- Quality of activity proposed to identify critical mission technologies and show how they will reach TRL-5 by end of ESA Phase B1
- Degree to which the funding will develop and consolidate the scientific and technology teaming in the UK.

Quality of project planning, management arrangements and value for money (20%)

- Quality, completeness and realism of timescales of the project plan
- Capability and track record of the team members - ability of the team to deliver the outcomes proposed
- Value for money of the work proposed relative to the Grant requested

7 PROJECT MONITORING AND REPORTING

Following an award and completion of contractual formalities, the CEOI will assign to the project an experienced coordinator drawn from CEOI partner organisations. The coordinator will oversee the projects with the following methodology:

- The coordinator will initiate the project, at a face-to-face meeting at the lead contractor's site, or by video conference call.
- Working with UKSA and NCEO, the CEOI co-ordinator will make arrangements for the proposal readiness review
- On completion, the project will provide to UKSA and CEOI a copy of the proposal to ESA (redacted if necessary to remove any commercially sensitive information), together with an Executive Summary. The latter will be suitable for publication.

8 ELIGIBILITY

We welcome bids from a variety of organisations including academia, industry and research organisations based in the UK. Bids into this CEOI Call should be led by a UK PI or member of the Core Science Team in the UK who is intending to submit a proposal into the ESA EE-11 Mission Call for Ideas⁵.

The details of some organisations may not be known by the UK Space Agency or the CEOI, especially for newer entrants. Such applicants should provide brief and relevant background information for the organisation, including areas of expertise and contact information including registration and official address.

Only those organisations in the proposed team which have not previously received a grant from CEOI or the Agency need provide this information in their bid. Organisations that have previously received a grant should provide a title and date of a relevant previous award.

Following receipt of bids and before award of any contract, new entrants may be required to provide additional eligibility details:

- It would normally be expected that 3 years of audited accounts are available for all project Partners. If 3 years of company accounts are not available, the bid response should provide details of the specific measures that will be taken to protect the UK Space Agency's grant investment;
- Evidence of company legitimacy and financial solvency, supported by e.g. company Annual Reports;
- Details of company quality processes and accreditation;
- Track record, supported by reputation or by statements from referees and customer testimonials;

⁵ UK technical teams who are considering providing support to a mission proposal led by a non-UK scientist should preferably team with a UK member of the core mission science team. If this is not possible, potential bidders should contact CEOI

Micro SMEs and single-person (Sole Trader) companies will need to show robust risk mitigation against single point resource failure and the measures in place to protect the grant investment.

It is possible that some consortia bidding for projects may need to involve non-UK entities. This is allowable in principle subject to the following conditions:

- The UK must lead the consortium;
- The UK work must represent a substantial proportion of the whole project;
- The consortium must demonstrate that the proposed non-UK capability is essential and not available in the UK;
- The non-UK based organisation cannot receive UK national funding
- The rules can be relaxed if the non-UK entity is supplying PV or capability, and resources on a no-exchange-of-funds basis;

Full details of the non-UK participation must be provided in the bid, appended to the eligibility statement.

9 CONFIDENTIALITY

The UK Space Agency confidentiality rules will apply. The procedure for handling and assessing the bids and notifications will be as follows:

- Bids will be submitted to the University of Leicester administrator who will act on behalf of the CEOI. The administrator will hold all bids in confidence and will not propagate the bids internally in the University or elsewhere.
- Electronic copies of the bid documents will be distributed to the independent assessment panel members, to the CEOI Director and to the CEOI Technology Programme Director.
- Bids not recommended by the Panel will be destroyed. They will not be visible to the wider CEOI Leadership Team or to any others;
- Bids selected for funding will remain confidential (i.e. will not be visible to staff of any of the CEOI Partners other than the project co-ordinator).

A standard CEOI Non-Disclosure Agreement can be used to cover information exchange between the project participants and CEOI staff at any stage during the bid or contract. A copy is available on the CEOI website.

10 SUBMISSION AND CONTACT INFORMATION

Only the lead institution should submit an application. Bids should be submitted to the University of Leicester administrator, who will act on behalf of the CEOI.

- Proposals should be submitted electronically in PDF format. **The proposal should preferably be contained in single PDF file (apart from the separate Excel format Finance Table).**
- In submitting a proposal, bidders accept that all information supplied as part of the bid will be handled under the procedures defined in Section 9, irrespective of any confidentiality markings.

The proposal should be sent by email to the CEOI Technology Call Administrator, Charlotte Moretti cm738@leicester.ac.uk. CEOI will acknowledge receipt of each proposal by return email, within one working day of receipt.

Full details of the CEOI Call Administrator are as follows:

Charlotte Moretti
CEOI Technology Call Administrator
Fielding Johnson Building (Room 201)
University of Leicester
University Road
Leicester LE1 7RH

Telephone: +44 (0) 116 229 7921
Email: cm738@leicester.ac.uk

For further information and formal enquiries contact:

Mr Chris Brownsword
CEOI Technology Director
QinetiQ Building, A8 Room 1004,
Cody Technology Park,
Ively Road, Farnborough
GU14 0LX

Tel: 01252 393918 (land line)
Mob: 07825 762527 (mobile)
Email: cbrownsword@QinetiQ.com

11 Application Form

The completed Application Form should be included with the Cover Letter when the full bid is submitted.

Title of Project		
Lead Organisation and Grant Requested for Lead		£
Project Partners and Grant Requested for each Partner		£ £
Address of Lead Organisation including postcode		
Lead Contact - Commercial (Name and e-mail)		
Lead Contact – Technical (Name and e-mail)		
GBER State Aid Category (see Section 13)		
Total Grant Funding Requested (£)		
Academic Contribution (£ and % of Total Project Cost)	£	%
PV Contribution (£ and % of Total Project Cost)	£	%
Total Project Cost (£)	£	
Proposed start date and duration		

12 State Aid intervention levels

Bidders should ensure their proposal is compliant with the relevant State Aid legislation. European regulations allows State Aid to companies for technology R&D activities via the General Block Exemption Regulations (GBER), with intervention rates (i.e. maximum % grant offered) depending on the type of activity, the type of organisation, and the size of the company as follows:

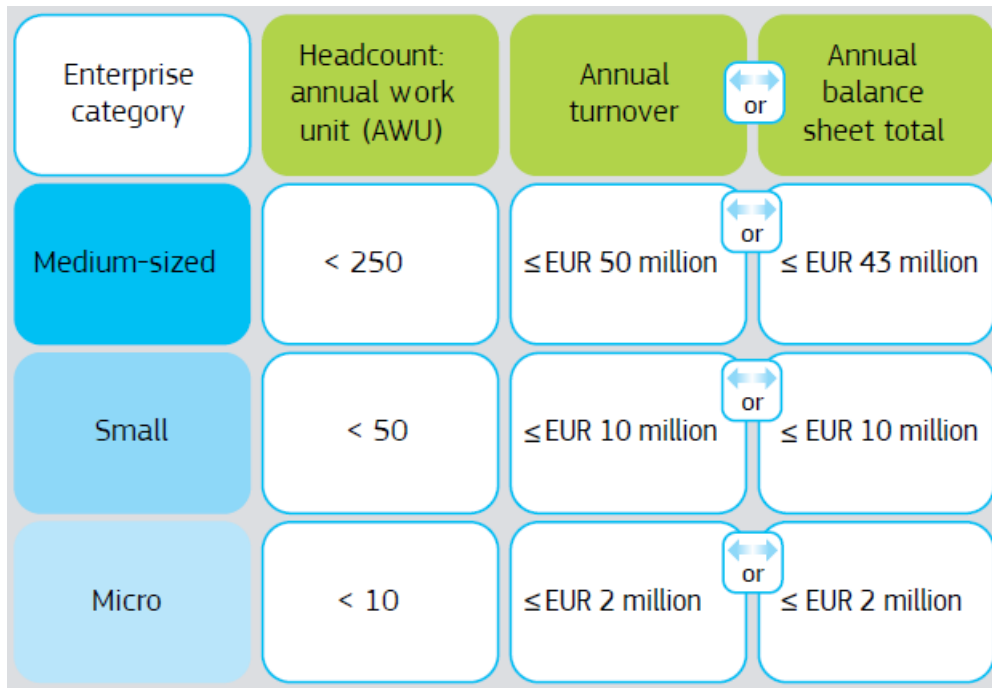
- **'fundamental research'** means experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any direct commercial application or use in view;
- **'industrial research'** means the planned research or critical investigation aimed at the acquisition of new knowledge and skills for developing new products, processes or services or for bringing about a significant improvement in existing products, processes or services. 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;
- **'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. 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;

- **'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;

Fig 1 EC definition of the various company types [RD3]:



Anything above the limits for a medium sized company is designated as a large enterprise.

Academic Partners and Research Organisations will be funded in all cases at 80% of Full Economic Cost (FEC).

This table summarizes the GBER State Aid categories and maximum allowable intervention rates.

State Aid Category	Intervention rate		
	SME	ME	LE
Fundamental Research	100%	100%	100%
Feasibility study	70%	60%	50%
Industrial research	70%	60%	50%
Industrial research projects involving collaboration/ dissemination ¹	80%	75%	65%
Experimental development	45%	35%	25%
Experimental development projects involving collaboration/dissemination ¹	60%	50%	40%

Note 1 Collaborations between businesses and research organisations where the research organisation bears at least 10% of the costs & have the right to publish their own research, or business to business collaborations which involve more than one member state of the EU/ EEA or involve at least one SME, provided that no one business partner carries more than 70% of the project costs. Procurement/supplier relationships do not qualify.