

THE BRAZIL  
ENERGY  
PROGRAMME

# Brazil Energy Programme of the UK Shared Prosperity Fund

## Challenge Competition - Solar Energy, Energy Storage and Smart Grids

Guidance Notes

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## Overview of the Brazil Energy Programme of the UK Shared Prosperity Fund and this Challenge Competition

The Prosperity Fund (PF) will invest £9m to support Brazil's energy transition to a lower carbon economy through the Brazil Energy Programme (BEP). The programme aims to leverage Brazil's enormous potential as a global leader in renewable energies for social impact.

BEP will be implemented between June 2020 and March 2023 and will focus on regulatory, policy, market and technological innovations in renewable energy sectors such as waste to energy (biogas), biodiesel, solar, storage and smart grid technologies, offshore wind, and natural gas as a transition fuel.

BEP aims to support growth in renewables that have direct impact on affordability, gender empowerment and economically disadvantaged communities using cutting edge methodologies and technologies. It will do so by leveraging private finance in Research and Development (R&D) to support innovative and inclusive joint technology solutions for energy-related global challenges.

The policy and regulatory development arm of the project is seeking to work with the Brazilian government on the following targets:

- Reduce carbon emissions by 500,000t CO<sub>2</sub>
- Create 2,500 jobs in the renewable energy sector
- Increase R&D spending on renewable energy by 30%
- Increase energy affordability by 1%
- Secure over £50m of investment in the Brazilian renewable energy sector

The pilots are intended to support the achievement of these objectives by demonstrating technologies that can be scaled up through policies and regulations that support more dynamic markets.

The consortium that will develop the cooperation actions within BEP is led by Adam Smith International (ASI), in partnership with Carbon Limiting Technologies (CLT) and Hubz.

### **Brazil Energy Programme Challenge Competition Objectives**

The objectives of the challenge competitions are to promote demonstration projects of innovative low carbon technologies in the solar, storage, smart grids, biofuels and biogas sectors that solve specific identified challenges faced by Brazilian government and industry partners.

The aim of technology demonstration is to prove the technical and financial viability of innovative technologies so that they can be deployed at scale to reduce poverty, increase energy access and affordability, and promote gender equity and social inclusion.

All challenge competitions are developed in conjunction with at least one Brazilian industry or government partner. The implementation of the successful project(s) will take place in association with at least one industry or government partner and in many cases on their site(s).

### **Purpose of this Pre-Qualification Questionnaire (PQQ)**

The purpose of this PQQ process is two-fold:

- To gather and validate a pool of potential technology providers for the first three BEP pilots; and
- To select technology providers (Technology Readiness Level 7 (TRL7) and above) for the Pilar Solar Pilot to participate in a consortia building phase and subsequent full application stage.

## Challenge Competition 1 - Solar Energy, Energy Storage and Smart Grids

The overall competition challenge statement for Challenge Competition 1 covered by this PQQ is:

- **How can a more advanced, clean, decentralised energy generation model deliver greater energy access and affordability for poorer communities in Brazil?**

These can include innovative on and off-grid technologies (e.g. solar PV, solar thermal, batteries, smart meters, In-home displays (IHDs), Home Energy Monitoring Systems (HEMS)) and Demand Side Response (DSR), smart grids, power systems architecture, related business and financial models.

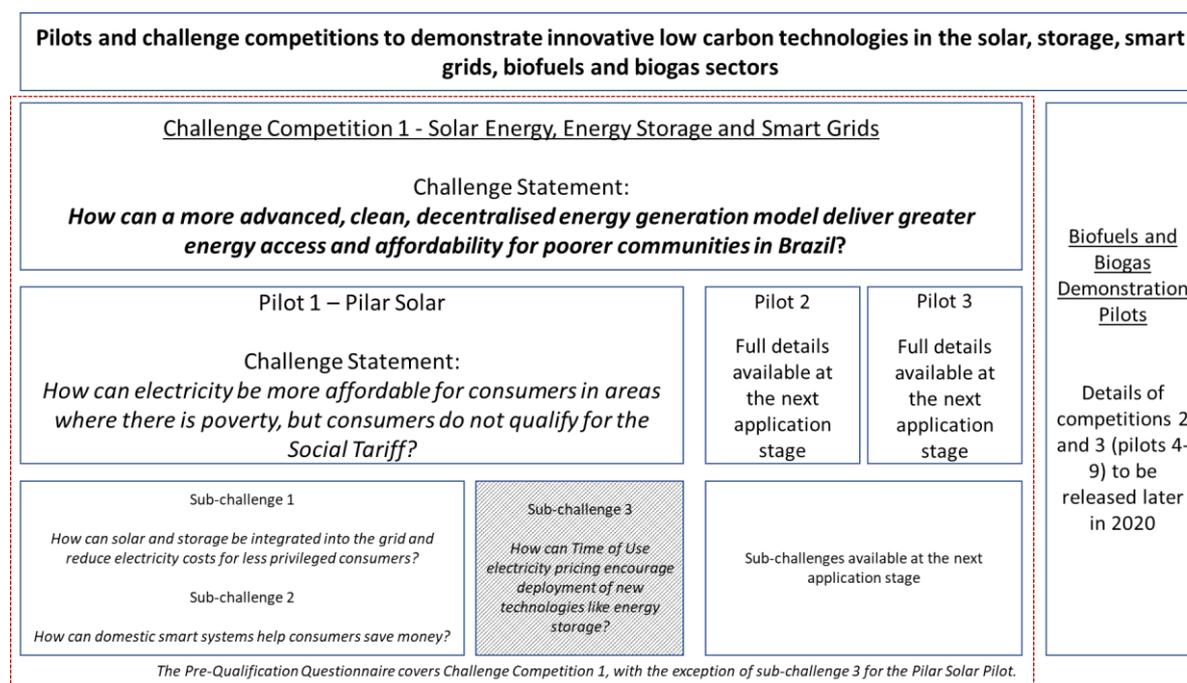
Under this Challenge Competition, we anticipate selecting three pilots, with grant funding of £3m in total.

Innovative solar PV and associated enabling technologies can provide electricity in an affordable and accessible way in both urban and rural communities, including for women-led households.

Solutions to this challenge should develop a financially sustainable model that can be replicated across other parts of Brazil. They should consider how time of use (TOU) tariffs (see the White Tariff below) could be calibrated to encourage the roll-out of renewable energy and energy storage technologies. Solutions should consider ANEEL's Normative Resolutions 482 and 687 that give tariff discounts to solar PV owners. They should also consider how smart metering or electricity use monitoring could be used to encourage energy-saving behaviour and reduce poverty, especially for women-led households.

Figure 1 below shows the relationship between the entire set of pilot programmes, this challenge competition and the specific pilots under this challenge competition.

Figure 1: Pilots and Challenge Competitions under the BEP



### Challenge Competition 1 – Webinar

We plan to hold a webinar on the Solar Energy, Energy Storage and Smart Grids challenge competition in early September. This will cover Challenge Competition 1, the application process including a ‘Consortia Building’ phase and provide background to the Brazil Energy Programme.

Details and joining instructions for the webinar will be made available on the [website](#) from which you downloaded this document and in the Pre-Qualification Q&As document which will be updated regularly through the process.

### First Pilot Project

The first of these pilots is the 'Pilar Solar' pilot. The Pilar Solar pilot has been developed with Light S.A, the Rio de Janeiro electricity distribution company. Light would like to retain its poorer consumers and to make electricity more affordable for consumers who do not qualify for the Social Tariff.

Pilar is a territory in the city of Caxias, Rio de Janeiro. In Pilar, 71% of residents earn under Brazil’s minimum wage (R\$ 1039, £\$148), with the average per capita income standing at R\$ 591,21.

Electricity companies are federally mandated to provide a Social Tariff to families whose income is less than half the national minimum wage, as well as to low income elderly or disabled people. For the consumer, the programme offers discounts on energy bills.

However, the tariff is not adjusted for regional differences in cost of living, so many poorer families living in urban areas can slip through the net as they do not meet eligibility criteria.

The White Tariff, targeting low voltage consumers of the regulated market (mostly residences and small businesses), was introduced on January 1st, 2020. It has three price points based on time of day and day of the week. Consumers have the discretion to decide whether to migrate from the conventional flat tariff. The modest discounts offered for off-peak consumption, the fact that migration is optional and that consumers are responsible for doing the estimations themselves, and the lack of public awareness all lead to a limited impact of the tariff to date.

The challenge statement for the Pilar Solar Pilot is:

- How can electricity be more affordable for consumers in areas where there is poverty, but consumers do not qualify for the Social Tariff?

This has the following 'sub-challenges' (technical aspects of the Pilar Solar Pilot):

*Sub-challenge 1: How can solar and storage be integrated into the grid and reduce electricity costs for less privileged consumers?*

Households that produce solar power (for self-consumption when needed, for storage, and to be fed into the grid when not needed domestically) are given a reduction on the cost of grid electricity.

Solutions to this sub-challenge should include the installation of solar PV and storage for households and consider how that electricity production can be linked to the grid, so that they receive the tariff discount. Solutions should be compatible with household-level smart technologies (i.e. sub-challenge 2).

*Sub-challenge 2: How can domestic smart systems help consumers save money?*

Households do not have information about how much electricity they use overall, how much different appliances consume, and what options exist to reduce energy use or when to potentially change their behaviour to save money should TOU tariffs be introduced.

Solutions to this challenge should involve the installation of smart technologies that tie household consumption to billing, enable identification of energy efficiency opportunities, and help consumers make cost-saving decisions should TOU tariffs be implemented. Solutions should also be compatible with solar and storage integration.

To support the pilot's aims, Light (see above) will install and test solar PV at one of their substations, and, using Agência Nacional de Energia Elétrica (ANEEL – the Brazilian Electricity Regulatory Agency) Normative Resolutions 482 and 687, deliver energy to approx. 60 households in Pilar.

To enable the use of TOU tariffs, BEP is in discussion with ANEEL to develop a regulatory sandbox.

*Sub-challenge 3: How can Time of Use electricity pricing encourage deployment of new technologies like energy storage?*

This sub-challenge is not part of the competition. It will be addressed by Brazilian partners, working together with the grant recipient. Applicants do not need to address this part of the challenge.

## **Second and Third Pilot Projects**

The second and third pilot projects relating to the solar energy, energy storage and smart grids challenge statement are being developed with industry partners in Brazil. The second and third pilots, will follow on from the Pilar Solar pilot, addressing the same overall competition challenge statement related to an advanced decentralised model (on or off grid), but will have their own specific challenge statements related to those particular pilots.

Applicants which successfully complete the PQQ process will automatically be invited to the consortia building stage for both the second and third pilots.

Applicants to the Pre-Qualification stage must demonstrate that they can deliver a solution to address either the Challenge Competition 1 challenge statement and/ or a component of the Pilar Solar pilot challenge statement.

BEP will provide incubation support to successful grant recipients. This support will focus on helping the grant recipients to prepare commercial plans and actions that will increase the chance of successfully rolling out the technology into the Brazilian market or accelerating the time to market. Receiving and participating in incubation support is a condition of the grant.

The starting point for incubation support is to consider the current stage of commercial preparation and identify (with the grant recipient) critical next steps, business strengths and gaps, benchmarked for the stage of the individual business across all key capabilities, namely:

- Market understanding
- Business development and sale
- Strategy and Business Planning
- Technology
- Product
- Supply chain and operations
- Team
- Funding and investment readiness

Our experts will support the company in the development of the appropriate knowledge and skills. This may include but will not be limited to services such as:

- Market research, segmentation and validation of market requirements
- Assistance to determine route to market and engaging industrial partners
- Intellectual property advice
- Evaluating alternative commercial strategies and support with business planning
- Investment readiness/fund raising support

All proposals that are awarded funding for innovation development will undergo assessment for incubation support requirements.

Incubation support will be managed by CLT and is a State Aid delivered under the De Minimis exemption. This means that you will not be required to contribute to the costs of incubation support. However, De Minimis aid is limited to a maximum of 200,000€ over a three-year rolling period. You will need to confirm your eligibility to receive this aid as part of the due diligence process and we will provide further guidance in the full application documents.

The role of incubation support has been integrated into the grant monitoring processes and thus any failure or refusal to support this element of the programme will result in termination of the grant.

## Application and Assessment process

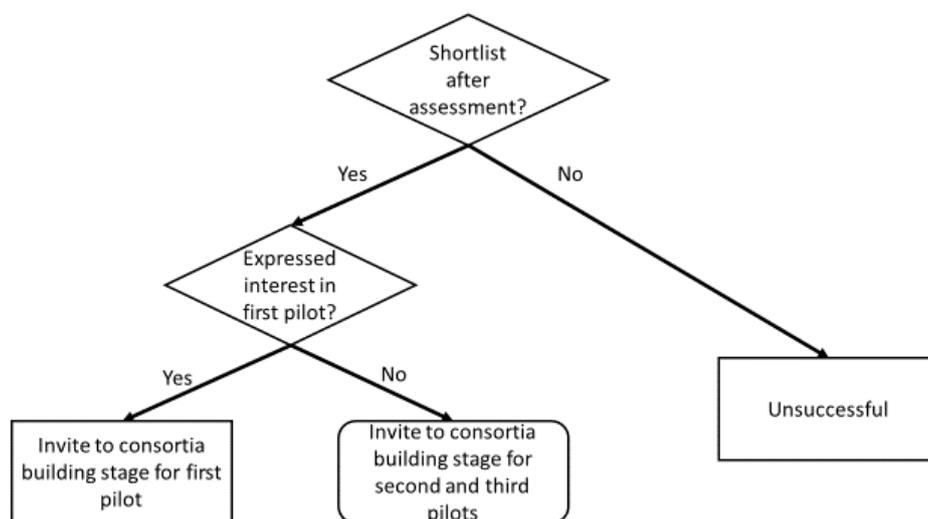
The BEP competition operates a three-stage application process set out below. The objective for this competition is to select a single grant funded project to deliver against the challenge. This project will be delivered by either a consortium or a single applicant, where that company can deliver against the entire challenge.

Stage 1 – Pre-Qualification – a shorter application which will be assessed to ensure that the technology provides a strong fit to the competition challenge, can address the competition’s key target groups and is achievable within the timescale of the pilot. This stage will result in a shortlist of potential applicants who will be invited to the second stage.

Those on the shortlist who have expressed an interest in the Pilar Solar Pilot will be invited to the Consortia Building and Full Application stages, and those not shortlisted will be informed and given feedback on their applications. Those who have been shortlisted but not expressed an interest in the Pilar Solar Pilot will be invited to the Consortia Building and Full Application stages when these launch.

The decision tree for the PQQ outcome is set out in Figure 2 below:

Figure 2: Decision Tree for PQQ Outcome



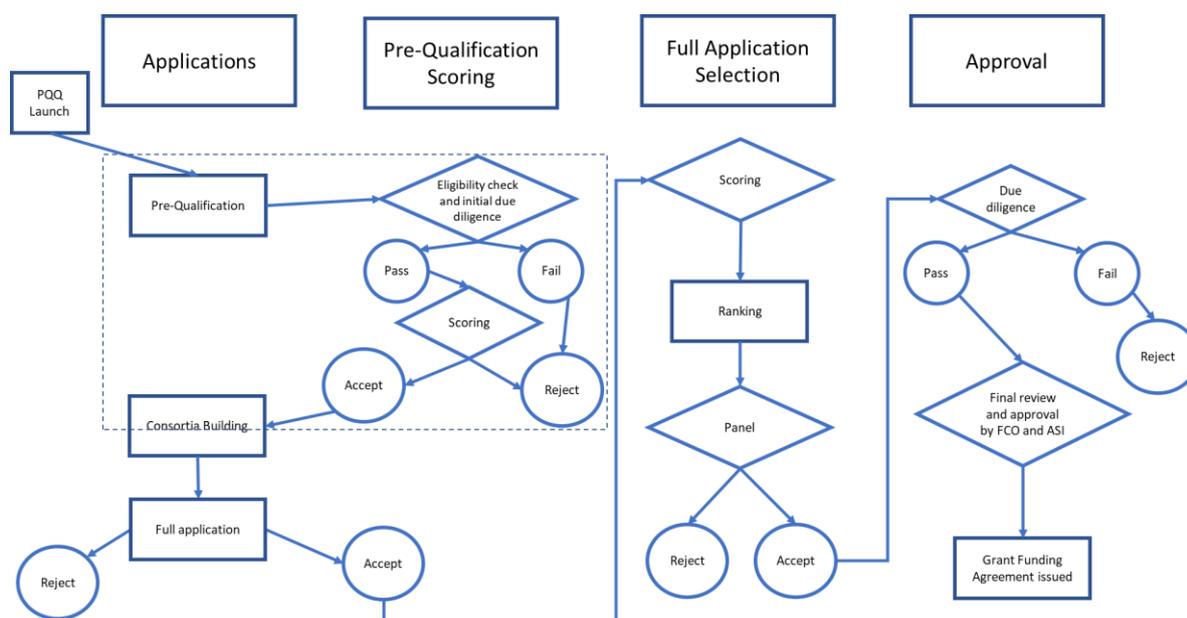
Stage 2 – Consortia building – although we expect some applicants to be able to deliver against the entire pilot project themselves and others to have pre-existing consortium partners, all shortlisted candidates will participate in a facilitated consortium building stage. The objective of this stage is to develop a set of consortia which will then be able to respond in the third stage.

Stage 3 – Full application – the full application and supporting documents will be issued to all shortlisted organisations and will allow a detailed assessment of projects based on the fit to the pilot project challenge, the impacts on target groups, the impact on emissions reductions and the feasibility and achievability of the proposed project. This stage will result in the selection of a project which will proceed to due diligence and contracting.

Note on consortia: the successful project can be delivered by a consortium or a single applicant, where that company can deliver against the entire pilot project. The second stage allows the opportunity for shortlisted companies to build consortia or for an existing consortium to strengthen its memberships. You should be aware that where a lead applicant submits a Pre-Qualification application on behalf of a consortium this will cover all members of that consortium as a group. Other shortlisted qualified applicants can then be added to the consortium and members can leave; however, a consortium member cannot join another consortium or apply on their own unless they have submitted a Pre-Qualification application in their own right and been shortlisted. You are therefore encouraged to apply individually and form consortia at the consortium building stage.

The overall application process and assessment flow is as follows:

Figure 3: PQQ Application Process Flow



## Stage 1 – Pre-Qualification

### Pre-Qualification Application

The first BEP competition launched on 17<sup>th</sup> August 2020. You can access the competition documents using the following weblink: <https://www.ukbrep.org/innovative-technologies#upcoming-pilots>

The application documents are:

- BEP Competition Guidance – Pre-Qualification Guidance Notes (this document)
- BEP Questions and Answers
- Pre-Qualification Application form
- Partner Details Form (where relevant, partners in a consortium may also apply for Pre-Qualification on an individual basis)
- Letters of support from collaborators/partners (where relevant, no template provided)

Using the guidance set out below, you must complete the Pre-Qualification Application Form by midday (UK time) on 25<sup>th</sup> September 2020 and submit them via email to [pilotapplication@ukbrep.org](mailto:pilotapplication@ukbrep.org).

Although we expect to email confirmations of receipt, we recommend that you use a delivery receipt to confirm that your application was received before the deadline.

We will accept additional supporting information in the form of further annexes; however, you should not assume that any additional information will be reviewed as part of the assessment process and your application should not rely on information cross-referenced within annexes.

Once your application has been submitted and entered the assessment process, no further material information can be added to your application. Applications will be judged on the information that is provided.

### **Pre-Qualification Assessment – Eligibility Checking**

After receipt of your application an initial eligibility check will be carried out on it. This will include:

- Does the technology fit the scope of Challenge Competition 1 for the first three pilots?
- Be at a higher technology readiness level (TRL), i.e. we anticipate technologies will be at TRL 7 operational prototype or higher.
- Technologies must be adaptable for the Brazilian energy system.
- Is the applicant (or any partner if a consortium) an undertaking in difficulty?
- Do any small and medium-sized enterprises (SMEs) meet the SME definition criteria?
- Has the company provided the required Health and Safety commitment and is a policy supporting that available? N.B. If the commitment is made but no policy is in place, the applicant will be required to put one in place before the Full Application stage.

These are yes/no questions and a 'no' answer to either of the first two questions will exclude the PQQ application from proceeding. If an applicant states that they are an SME but do not meet the SME criteria, they will be able to proceed to the shortlist but will not be able to receive the same grant rate as an SME.

## **Pre-Qualification Assessment – Scoring**

Following the eligibility check, the eligible applications will be scored by assessors. For scoring methodology please see the *Completion of the Pre-Qualification Application Form* section below, p.25)

Scoring will take place in line with the assessor questions set out in this document below and after scoring a shortlist of potential applicants will be identified. Those on the shortlist who have expressed an interest in the Pilar Solar Pilot will be invited to the Consortia Building and Full Application stages and those not shortlisted will be informed and given feedback on their applications. Those who have been shortlisted but not expressed an interest in the Pilar Solar Pilot will be invited to the Consortia Building and Full Application stages when these launch.

## **Feedback – Pre-Qualification stage**

Unfortunately, we cannot guarantee that we will provide feedback to applicants after the Pre-Qualification stage. For those applicants who progress to the next stage, generalised feedback will be provided to support high quality full applications.

Where applicants are invited to proceed to the next stages, addressing all of the comments made in the feedback is not a guarantee that your application will be successful as the assessors at the next stage may be different and the Full Application explores the projects in more depth. In any case, it is your decision as to whether you act on the suggestions made.

The following provides a high-level description of the Full Application process for those applicants who are successful at the Pre-Qualification stage. Full details of this process will be set out in the BEP Full Application Guidance.

## **Consortia Building Stage**

We will facilitate a process to support shortlisted qualified applicants to build consortia. This will include:

- Sharing the one-page summaries you provide at the start of your Pre-Qualification application forms
- A mechanism to enable you to make direct contact with any other pre-qualified applicant (or pre-qualified consortium lead in the case of consortium applications)
- Notification system to enable us to know we have sufficient interest from consortia or single applicants that there will be a response to the full application stage

The objective of this stage is to reach a position where we can be assured that there will be more than one application to the full application stage be that from consortia or individual companies.

## **Full Application Stage**

We expect that the Full Application stage of this competition will launch on 26<sup>th</sup> October 2020. Successful applicants who are participating in the Consortia Building stage will be advised if this date changes.

As applicants at the full application stage have been invited, competition documents will be emailed directly to all applicants at the launch of the stage. You must therefore ensure that, if any of the contact details provided in your Pre-Qualification application have changed, you inform us of any changes by emailing [pilotapplication@ukbrep.org](mailto:pilotapplication@ukbrep.org).

The full application documents will comprise:

- Guidance
- Application form
- Finance form
- Risk register

Based on the expected launch date for the full application stage, we anticipate the deadline being midday on 23<sup>rd</sup> November 2020. As for the Pre-Qualification stage, responses will need to be emailed to us by that date.

### **Full Application Assessment and Selection**

Full applications will then go through a three-stage assessment and selection process. The first part of which will be another eligibility check to ensure compliance of the proposed project with state aid requirements, etc. There will then be scoring by assessors against the criteria set out in the Full Application Guidance (to be published to applicants who pass the PQQ stage). The second part will be a review of all the applications by a selection panel which is likely to include representation from:

- BEP partners
- FCO
- Industry partner(s) for the competition challenge

The Panel will make recommendations for which project(s) should be funded to the BEP partners and these recommendations will be reviewed by ASI and the FCO.

### **Due Diligence and Contracting**

Project(s) recommended for funding will then need to complete a formal due diligence process. This will include checks on the applicant firm's:

- Character and reputation, i.e. any recent convictions or judgements against the business
- Compliance with all statutory and regulatory requirements
- Ownership, whether any government officials (UK or Brazil) are involved in the company in a paid or ownership capacity

- Formal undertaking in difficulty test and financial viability check. These will include looking at the latest independently audited accounts filed on the Companies House database.
- Confirmation of SME status (if applicable) and State Aid compliance
- Confirmation of eligibility of all proposed costs.

Following successful completion of the due diligence stage, we will be able to draft the Grant Agreement.

## Eligibility for funding

To be eligible for funding, proposed projects at full application stage must meet all of the following criteria:

1. Fit the specific pilot project challenge set out for the full pilot competition.
2. Fall within the EU General Block Exemption Regulation Article 2 definition of experimental development (86) and be eligible under Section 3 Article 22 (Aid for start-ups) or Section 4 of Article 25 (Aid for research and development projects).
3. Funding requested cannot cover retrospective costs. The value of retrospective work may, however, be considered in the assessment process.
4. The funding levels applied for must be consistent with the appropriate Block Exemption aid intensity levels (including consideration of the cumulative effect of other forms of state aid) and costs must be consistent with the eligible cost criteria (as set out below).
5. Applicants will need to have private funding in place to cover the balance of the eligible costs, i.e. the difference between the total costs and the BEP grant. Such funding may come from a company's own resources or external private sector investors but may not include funding attributable to any public authority or EU institution.
6. The total requested grant does not exceed the value set out in the Full Application Guidance Notes.
7. Projects must be completed in 12 months.

Companies of any size are eligible to seek funding. Applications from SMEs, as defined by the EU<sup>1</sup>, are particularly encouraged.

An individual organisation may not submit more than one application as an applicant / consortium lead to a specific BEP competition but may act as a consortium partner in other applications.

### **Funding Levels and State aid requirements**

This grant scheme will operate under two different General Block Exemption Regulation articles for State Aid. The two articles are Article 22 'Aid for start-ups' and Article 25 'Aid for research and development projects'.<sup>2</sup>

The size and type of funding that the project can receive will depend upon the type of applicant and which GBER Article they qualify under. These can broadly be defined as "small enterprises" (as defined by the EU) and "all other applicants".

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<sup>1</sup> [http://ec.europa.eu/enterprise/policies/sme/files/sme\\_definition/sme\\_user\\_guide\\_en.pdf](http://ec.europa.eu/enterprise/policies/sme/files/sme_definition/sme_user_guide_en.pdf)

<sup>2</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN>

### Funding for Small Innovative Start-ups

Small start-ups applying under this scheme may be eligible to be funded under Article 22. In order to be eligible, the company must be:

- A small enterprise as defined by the EU<sup>3</sup>
- In existence for less than 5yrs and unlisted

R&D expenses must represent at least 10% of total operating expenses in at least one of the three years preceding the date of application or in the case of a start-up without any financial history, in the audit of its current fiscal period, as certified by an external auditor.

Companies that are successful in receiving funding and that have indicated that they are eligible for funding under this State Aid article, may additionally be asked to provide a copy of their business plan prior to the final award letter being issued.

If as a 'Small Start-up' you are not eligible for the Small Start-ups scheme defined above (have been in existence for over 5 years, or have not spent 10% of total operating expenses in one of the last 3 years on R&D) then it is still possible to qualify for funding under the All Other Applicants scheme as detailed below.

### Funding for All Other Applicants

The scheme is also open to:

- all SMEs (including Small Enterprises who do not qualify above)
- other private sector organisations irrespective of size
- collaborative proposals

The maximum percentage of public funding that can be provided for the project is summarised below in Table 1.

NOTE: If you are applying as a Small Innovative Start-up, this table does not apply.

*Table 1: Maximum public funding for projects*

Research Category	Size of Enterprise	Maximum amount of aid towards eligible Project Costs
Experimental Development - Single	Small	45%

<sup>3</sup> A small enterprise employs fewer than 50 people and has an annual turnover and/or balance sheet of less than €10m. See Annex 1 of the General Block Exemption Regulation: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN>

Companies	Medium <sup>4</sup>	35%
	Large <sup>5</sup>	25%
<b>Experimental Development - Collaborations</b> (either Business to Business or between Business and research organisations)  Note: certain conditions must be fulfilled for collaboration (See Article 25(6) of the Block Exemption <sup>6</sup> )	Small	60%
	Medium	50%
	Large	40%

The figures represent the maximum aid intensity that the BEP grant can provide. State Aid compliance is a legal requirement and the risk of non-compliance rests with the grant recipient<sup>7</sup>. It is therefore crucial that you address State Aid fully within the application, as any errors at this stage may result in an offer of a reduced level of funding.

Please note: if you are applying under Article 25, you will be required to demonstrate that your project falls within the definition of experimental development as set out in Article 2(86) of the regulation.

### Public funding

When considering levels of aid intensity (described above), public funding includes the grant and all other funding from, or which is attributable to, other government departments, UK public bodies, EU Member States or the EU institutions. Such funding includes grants or other subsidies made available by those bodies or their agents or intermediaries (such as grant funded bodies).

In applying to this competition, you must state if you are applying for, or expect to receive, any funding for your project from public authorities (in the UK or in EU Member States) or the EU or its agencies. Any other public funding will be cumulated with the BEP funding to ensure that the public funding limit and the aid intensity levels are not exceeded for the project.

<sup>4</sup> A medium sized enterprise employs fewer than 250 people and has an annual turnover of less than €50m, and/or a balance sheet of less than €43m.

<sup>5</sup> A large enterprise employs more than 250 people or has an annual turnover of more than €50m, and/or a balance sheet of more than €43m.

<sup>6</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN>

<sup>7</sup> The UK's rights and obligations of EU membership, including compliance with State aid rules, continue to apply until the UK's exit from the EU has been completed, and therefore for this competition.

Whilst we will check the information provided to try and ensure that applicants meet the requirements of State Aid, applicants should establish that they fall within the state aid rules before submitting applications. Applicants must notify them of any change to situation or circumstance during the project.

If there is a breach of State aid regulations, for whatever reason, the European Commission requires repayment of any grant received, including interest, above that which was due. In this situation, applicants will be required to repay any funding received. It is also important to ensure that the total grant funding for the project from public sources (including from the European Commission) does not exceed the permitted percentages stated for the relevant Article.

### **Match Funding**

Match funding that you bring to the project must be private money, as described above additional public funding cannot be used as match. Project co-funding provided by Light does not count as match funding.

Contributions in kind are not considered as eligible match funding. This does not mean that staff time and costs cannot be used as match funding, it can. However, a notional cost, i.e. one where no money changes hand, cannot be used as match, this might include gifted materials or items or an internal recharge from one department to another, in the case of an internal recharge the actual cost incurred by the company could be used as match but this would have to be demonstrated and claimed not just the recharge itself.

### **Brazil 1% R&D Levy**

The Brazilian 1% R&D levy will contribute to the wider Brazilian R&D component (sub-challenge 3) of the BEP pilot.

In 2000, Law 9.991 instituted the rules for investment obligation in RD&I and energy efficiency (EE) by electricity companies. In total, 313 concessionaires engaged in generation (149), transmission (63) and distribution (101) of electric energy, licensees of electricity distribution, and those authorized to independently generate electricity are all obligated to invest in RD&I. Companies that generate energy exclusively from wind, solar, biomass, qualified co-generation and small hydro-electric powerplants are excluded from the obligation.

Distribution companies, in addition to the obligation to invest in RD&I, have an obligation to invest in energy efficiency programmes for the end use of energy. The obligation amounts are calculated in percentage terms based on a company's net operating revenue (ROL).

BEP is solely responsible for the sourcing of any funding under the 1% R&D levy.

## Project Plans and Financial Profiles

Projects are expected to be up to 12 months in duration. All projects must be complete 12 months after their start date and finish at least six months before the end of the Brazil Energy Programme (March 2023) to allow time for market scalability activities.

We will not make payments in advance of need. We understand, however, the difficulties which small businesses may face when financing this type of project. We will explore cash flow issues with the successful applicant(s) as part of developing the financial and milestone profile within the Grant Agreement. We will offer flexibility in terms of profiles and payments, within the confines of the requirements for use of public money within which we operate.

### **Taxation and Import Regulations**

For UK registered applicants, the BEP grant can only cover VAT costs which you are unable to recover from HMRC through your VAT returns. This could be because you are not registered for VAT. You should seek professional advice on the VAT position in respect of your BEP grant project costs if you are unsure. Please note, we are unable to give VAT advice. For international applicants the BEP grant can only recover sales tax costs which you are unable to recover from the relevant tax authority.

Further information on Brazilian taxation and import regulations will be provided at the Full Application stage, in meantime the following organisations are useful:

The British Chamber of Commerce in Brazil has members offering legal advice and services to exporters.

Alternatively contact DIT Brazil for advice.

### **Intellectual property**

As a first step, we advise you to speak to an intellectual property lawyer if you think you need patent protection when exporting.

Brazil is a member of the World Intellectual Property Organisation (WIPO), and legal provisions are generally consistent with international standards.

## Assessment Process and Criteria

All Pre-Qualification applications will be considered against the assessment areas described below and ranked against each other to create a shortlist of applications which will be invited to the Full Application stage.

The application form and guidance notes are designed to inform you about the types of information you should provide in order for your proposed grant project to be assessed.

For the avoidance of doubt, the individual questions listed under the headings below do not constitute assessment sub-criteria but are an indication of the kinds of factors that will be considered in assessing each aspect of a proposal. Please see the *Completion of the Pre-Qualification Application Form* section below, starting on page 25, for the weighting of different areas and the assessment questions.

We will shortlist projects that offer the best value for money taking account of the areas in the following table in the pre-qualification assessment:

*Table 2: Areas considered in the PQQ assessment*

<b>1. Fit to competition challenge</b>
<p>For this aspect of the proposal assessors will consider a range of questions. These will include (but not be limited to) the following:</p> <ul style="list-style-type: none"><li>• To what extent does the proposed technology fit with the overarching theme of the competition challenge statement?</li><li>• Are there any areas of the overall Competition Challenge and/or sub-challenge statements that are not addressed by the proposed technology? If so, have they been adequately mitigated?</li><li>• Has the stated TRL of the technology been justified?</li><li>• To what extent are the dependencies or requirements for implementing the proposed technology/technology achievable?</li><li>• What is the chance of success of market adoption and at what scale?</li></ul>
<b>2. Impact on target groups and environmental factors</b>
<p>For this aspect of the proposal assessors will consider a range of questions. These will include (but not be limited to) the following:</p> <ul style="list-style-type: none"><li>• How significant is the potential impact for the competition's key target groups?</li><li>• What benefits will accrue to the target consumer groups, both directly and indirectly, and the industry partner?</li><li>• How significant is the technology's impact on environmental factors, in particular greenhouse gas (GHG) emission reduction and energy reduction/ efficiency?</li></ul>

<ul style="list-style-type: none"> <li>• Does the technology have a direct impact or is it an enabler?</li> <li>• What are the likely impacts over different timescales?</li> </ul>
<p><b>3. Value for money and additional benefits</b></p>
<p>For this aspect of the proposal assessors will consider a range of questions. These will include (but not be limited to) the following:</p> <ul style="list-style-type: none"> <li>• Does the technology represent good value for money?</li> <li>• Are the potential savings from the technology realistic and justified? To what extent have they been validated?</li> <li>• How convincing is the case for their relevance to Brazil?</li> <li>• How significant are the BEP secondary benefits which the technology will bring and how realistic do you feel these are?</li> </ul>
<p><b>4. Technology success factors and risks</b></p>
<p>For this aspect of the proposal assessors will consider a range of questions. These will include (but not be limited to) the following:</p> <ul style="list-style-type: none"> <li>• How well have the critical success factors and risks been considered and evidenced?</li> <li>• Does the technology look feasible and what are the key risks for technology delivery?</li> <li>• How well does the venture recognise the critical success factors and risks for the technology?</li> <li>• Has the technology achieved relevant certifications, especially any health and safety certifications?</li> </ul>
<p><b>5. Experience and skills</b></p>
<p>For this aspect of the proposal assessors will consider a range of questions. These will include (but not be limited to) the following:</p> <ul style="list-style-type: none"> <li>• To what extent does the organisation and delivery team have the right skills and experience to deliver the technology's intended benefits to time and quality? Can any skills gaps be addressed by the incubation support?</li> <li>• Has the delivery team been described?</li> <li>• Are there any skills gaps, if so, is the applicant aware of them?</li> </ul>

## **Notification**

Applicants will be informed by email whether their application has been successful in the Pre-Qualification stage.

We will publicise the results of the competition which would include engagement with the media. At the end of the Full Application and assessment process, we may issue a press release or publish a notice on the website. These may, for example, outline the overall results of competitions and describe the project(s) to be funded.

Some organisations may want their activities to remain confidential and you will be given a chance for you to exclude your company or organisation name from involvement in media relations activity but in such cases, it would be expected for the project to remain a subject of media attention. However, the public description of the project you provide in your application will be made available in the public domain if your application is successful, and you are not able to opt out of the public project description being published.

Any organisation that wishes to publicise its project, at any stage, must contact their BEP Monitoring Officer before doing so.

## **Right of appeal**

There is no right of appeal against the decisions reached at either the Pre-Qualification or Full Application stages. Disagreement with the feedback or assessor comments is not a valid reason for an appeal.

The only circumstances in which an appeal may be considered are where the process set out in these guidance documents has not been followed and an appeal is then only likely to be successful where this can be demonstrated to have directly impacted on the outcome of the process.

## **Confidentiality and Freedom of Information**

Where any request is made to the FCO under the Freedom of Information Act 2000 (“FOIA”) for the release of information relating to any project or applicant, which would otherwise be reasonably regarded as confidential information, then we will notify you of the request as soon as we become aware of it. By signing the application form, an applicant acknowledges that any lists or schedules provided by it outlining information it deems confidential or commercially sensitive are of indicative value only and that we may nevertheless be obliged to disclose information which the applicant considers confidential.

As part of the pre-qualification application process all applicants are asked to submit a public description of their proposed technology. This should be a public facing form of words that adequately describes the project but that does not disclose any information that may impact on Intellectual Property, is confidential or commercially sensitive. This

information will be shared amongst other successful pre-qualification applicants to facilitate the consortia building stage.

All assessors used during the assessment of applications will be subject to a confidentiality agreement.

## Completion of the Pre-Qualification Application Form

This section aims to guide you through the completion of the Pre-Qualification Application Form. It is important that a response is provided to every question. This guidance is intended to explain what type of information applicants should consider providing in order to help us assess the applications effectively.

Applications will be judged based on the information provided in the application form and any supporting information provided. There will not be the opportunity to enter into discussion about your project with the assessors. These guidance notes are not intended to be exhaustive; applicants are expected to develop their own responses based on their own skills, knowledge and experience. Applicants are encouraged to be concise and to the point whilst providing all the necessary and relevant information.

Throughout the form there are grey boxes, in order to answer the question or provide information you should simply click on the box and begin typing or select from the drop-down menu. Questions do have character limits and when the text has reached the character limit you will not be able to add any further information and the text must be edited to fit within the character limit.

### Proposal Details

The initial section of the application asks you to provide details about your organisation. Guidance is provided in table 3 below:

*Table 3: Guidance on Business Details section of application form*

Section/Field	Guidance
<b>Summary Information</b>	
Names of business	Provide the name of the lead applicant business
Technology	A brief name or description of the technology or approach that you bring to address the competition.
Implementation time	Enter the expected duration in months, taking into consideration the maximum project length of 12 months
<b>Contact details</b>	

Contact Details	Name and details of the person who will be the main point of contact for the application process
Business Type	Please select from the drop-down menu
<b>Business Details</b>	
Number of employees (including directors)	Number of staff in your organisation (this will help us confirm the nature of your company)
Turnover (in most recent annual accounts)	Please provide your most recent turnover figure from annual accounts and the date of those accounts
Balance Sheet Total (total assets net of depreciation)	Please provide your most recent balance sheet total (total assets net of depreciation) and the date of the calculation.
Business maturity	Please enter the age of the business since its formal formation, this includes any periods of dormancy with Companies House.
Does the business have a parent company?	We need to understand if there any significant shareholders in your business. The parent company details should be provided in the Parent Company details section.
Is the business able to recover VAT?	Please answer yes or no to signify whether input VAT needs to be included in the project costs. If you are able to recover this VAT from HMRC you cannot include it in your project costs.  You should seek advice if you are unsure about your VAT status in relation to this application.
Please confirm your commitment to Health and Safety and that your business operates in line with health and safety requirements	Health and Safety is of critical importance to the Brazil Energy programme and you must confirm that your business operates in line with health and safety guidelines and legal requirements.

<p>Please confirm that you have a Health and Safety policy and that this is available on request</p>	<p>You should confirm whether you have a health and safety policy and that this is available on request.</p> <p>In the unlikely event that you do not have a health and safety policy in place, you will be required to develop one before the Full Application stage.</p>
<p>Which State Aid article do you expect to apply under?</p>	<p>You must select one of the General Block Exemption State Aid articles from the drop-down list. The options are:</p> <ul style="list-style-type: none"> <li>• Article 22 – Small Innovative Start Up</li> <li>• Article 25 – Experimental Development</li> </ul> <p>More details on the State Aid rules and requirements, are provided earlier in these Guidance Notes.</p> <p>N.B. You must select one of the State Aid options and adhere to its requirements or you will not pass the Eligibility Check.</p>
<p>If you selected a) Article 22, you must have spent more than 10% of operating expenses on R&amp;D in one of the last 3 years. Please provide details below.</p>	<p>If you are applying under Article 22, then you must have this GBER block exemption, then you must have spent more than 10% of operating expenses on R&amp;D in one of the last 3 years. Please complete the table to demonstrate that you meet this requirement.</p> <p>N.B. If you have selected Article 22 and cannot demonstrate the 10% R&amp;D expenditure in one of the last three years, you will not pass the Eligibility Check.</p>
<p>If you are applying under article 25, is this a collaborative project?</p>	<p>If you are applying collaboratively, please provide details of the partner organisations in the Entrepreneur Fund Partner Details Form.</p> <p>Sub-contracting work to a third party does not classify as a collaboration.</p>
<p>Parent Company Details</p>	<p>If you have a parent company or are an SME which is more than 25% owned by another enterprise, you must provide the details of that enterprise here. The details of the relationship</p>

	between SME eligibility and linked / partner enterprises is set out in Annex 1 of the General Block Exemption Regulation. <sup>8</sup>
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Table 4: Guidance on Engagement evaluation questions of application form

<b>Engagement evaluation questions (not scored)</b>	
How did you find out about the competition?	Please state where and how you found out about the challenge competition. This is to help us improve our outreach for future competitions and ensure as many potential applicants as possible are alerted.
When did you find out about the competition?	Please state when you found out about the challenge competition. This is to help us improve our outreach for future competitions and ensure potential applicants are alerted in good time to respond.
Had you considered Brazil as an export opportunity before hearing about the competition?	Please state whether you had considered exporting to Brazil prior to the competition. This is to help understand the impact of the BEP on businesses considering new export markets.

Table 5: Guidance on Interest in Pilar Solar Pilot Project section of application form

<b>Interest in Pilar Solar Pilot Project (not scored – for information)</b>	
Are you applying to be considered to participate in all three pilot projects?	Please confirm whether you want to be considered for the consortia building stages of Challenge Competition 1, all three potential pilot projects, under the overarching Solar Energy, Energy Storage and Smart Grids challenge statement.
If no, please confirm that you do not want to participate in the first pilot (Pilar Solar Pilot) project?  (In which case your successful PQQ will be held until the second pilot consortia building stage commences)	If, at this stage, you do not want to be considered for the consortia building stage for all the pilots, please confirm that you do not want to participate in the consortia building stage for the first pilot (Pilar Solar Pilot) project.  At this stage the specific challenges for the second and third pilots have not been finalised, so if you do not

<sup>8</sup> See Annex 1 of the General Block Exemption Regulation: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN>

	<p>want to participate in the consortia building stage for the first pilot (Pilar Solar Pilot) project, your successful PQQ will be held until the second pilot consortia building stage commences.</p>
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## Technology Description

The section of the application asks you to provide an initial summary of your technology and company as an introduction for the assessors and for use during the consortia building stage.

*Table 6: Guidance on Technology Description section of application form*

Section/Field	Guidance
Technology Description	<p>This should be a summary description of the technology and your company which should set the scene for the assessors and introduce your company and proposed technology. You should use language that can be understood by people without specialist knowledge or expertise.</p> <p>This question is not scored but will be used by assessors to gain a high-level understanding of the technology before they start their detailed assessment.</p> <p>The answer to this question will also be shared with all other successful Pre-Qualification applicants as part of the facilitated consortia building stage.</p>

**Questions:**

*Table 7: Guidance on technical questions section of application form*

Questions	Guidance for Applicants	Assessment questions will include	Max. score available
<p><b>1. Fit to competition challenge</b></p> <ul style="list-style-type: none"> <li>• Describe how your technology fits with the overarching theme of the competition challenge statement.</li> <li>• Explain any areas where your technology does not address the entire Challenge and sub-challenge statement and how this can be mitigated.</li> <li>• Explain any dependencies or requirements in implementing your technology.</li> <li>• State the current TRL of your technology and explain the TRL selected.</li> <li>• Explain the commercial case for your proposed technology.</li> <li>• Explain how your proposed technology would be scalable.</li> </ul>	<p>You should describe how your technology fits with the overarching theme of the competition challenge statement and the benefits that your technology will bring.</p> <p>You should state the current TRL of your technology and explain why you have selected this TRL.</p> <p>You should briefly describe competing technologies and explain why your technology is better. You should describe any areas where your technology is a poor or weak fit to the challenge statement and how you will mitigate these.</p> <p>You should set out any dependencies or requirements for implementing your technology, for example any control systems or supporting technologies that would be required.</p>	<p>To what extent does the proposed technology address the full scope of the competition challenge statement?</p> <p>Are there any elements that are not addressed? If so, have they been adequately mitigated?</p> <p>To what extent are the dependencies or requirements for implementing the proposed technology achievable?</p> <p>What is the chance of success of market adoption and at what scale?</p> <p>How likely is it that the proposed technology will be scalable?</p>	<p>30</p>

<p><b>2. Impact on target groups and environmental factors</b></p> <ul style="list-style-type: none"> <li>Describe the impact of the technology on the specific BEP target consumer groups in Brazil</li> <li>Describe the impact of the technology and the potential impact of the technology on environmental factors.</li> </ul>	<p>You should highlight how the innovation will make an impact on the BEP target groups identified in the call. For example:</p> <ul style="list-style-type: none"> <li>Consumers in poverty</li> <li>Less privileged consumers who cannot access the Social Tariff</li> <li>Women led households</li> </ul> <p>You should highlight how the technology will make an impact. For example:</p> <ul style="list-style-type: none"> <li>Is it through change in user behaviour resulting in reduced energy usage?</li> <li>Does the innovation reduce the cost of installation and/or maintenance for existing equipment?</li> <li>Is it through improved performance characteristics of a component or a material leading to greater efficiency?</li> <li>Does it give consumers the opportunity to generate an income?</li> </ul> <p>You should set out the impact of the technology and potential impact of the technology on the following environmental factors, if applicable:</p> <ul style="list-style-type: none"> <li>GHG emission reduction</li> <li>Energy reduction/efficiency</li> <li>Land use</li> <li>Water use</li> <li>Resource efficiency</li> </ul>	<p>How significant is the potential impact for the competition’s key target groups?</p> <p>What benefits will accrue to the target consumer groups, both directly and indirectly, and the industry partner?</p> <p>How significant is the technology’s impact on the environmental factors, in particular GHG emission reduction and energy reduction/efficiency?</p> <p>Does the technology have a direct impact or is it an enabler?</p> <p>What are the likely impacts over different timescales?</p>	<p>20</p>
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	<ul style="list-style-type: none"> <li>Product longevity</li> </ul>		
<p><b>3. Value for money and additional benefits</b></p> <ul style="list-style-type: none"> <li>Describe why the technology represents good value for money.</li> <li>Explain any cost savings that your technology brings or enables.</li> <li>Explain how your claims have been validated.</li> <li>Explain any additional benefits that will accrue as a result of this technology.</li> </ul>	<p>You should describe how and why your proposed technology is good value for money. This could include installed cost per KWh or other metric relevant to your technology.</p> <p>You should explain what cost savings your proposed technology delivers or enables and how these have been calculated.</p> <p>You should describe how you have validated the claimed savings and how you think they would apply to the Brazilian market.</p> <p>You should describe any additional benefits that will accrue as a result of your technology being adopted. For the purposes of the BEP competition, additional benefits are:</p> <ul style="list-style-type: none"> <li>Strengthened links facilitating UK-Brazil trade and investment flows</li> <li>Increase in UK outward direct investment in renewable energy</li> <li>New UK companies operating in the Brazilian renewable energy market</li> <li>Strengthened R&amp;D partnership with UK companies and universities</li> </ul>	<p>Does the technology represent good value for money?</p> <p>Are the potential savings realistic and justified? To what extent have they been validated?</p> <p>How far is the case for their relevance to Brazil convincing?</p> <p>How significant are the BEP additional benefits which the technology will bring and how realistic do you feel these are?</p>	<p>15</p>

	<ul style="list-style-type: none"> <li>• More UK companies providing clean energy technology in the market.</li> <li>• Improved perceptions of the UK as a leader in renewable energy</li> </ul>		
<p><b>4. Technology success factors and risks</b></p> <ul style="list-style-type: none"> <li>• Describe the top three critical success factors for your technology and how they will be measured.</li> <li>• Describe the top three challenges in implementing this technology and how they will be managed.</li> <li>• Summarise the key risks associated with the technology and how these will be monitored and managed.</li> <li>• Describe the current certifications which the technology has achieved, especially any relevant health and safety certifications.</li> </ul>	<p>You should describe the top three critical success factors for your technology. You should explain why these are important, how you will measure them and how they will be managed.</p> <p>You should describe the top three main challenges to implementing the technology, which should link to the key risks.</p> <p>Applicants should consider all risks technical, commercial, and environmental.</p> <p>One of the risks you should consider is the adaptation of your technology for the Brazilian energy system, which is different to the UK's.</p> <p>Your answer should cover strategies for managing and mitigating risks.</p> <p>You should describe the current certifications which your technology has achieved and any that are currently in progress or planned, along with timescales for these. We need to know, in particular, about health and safety related certifications covering the anticipated use of your</p>	<p>How well have the critical success factors and risks been considered and evidenced?</p> <p>Does the technology look feasible and what are the key risks for technology delivery?</p> <p>How well does the venture recognise the critical success factors and risks for the technology?</p>	<p>15</p>

	<p>technology in pilots in Brazil, e.g. technologies being installed in domestic properties.</p> <p>Please use the outline risk register template below Question 4 to provide a description of at least the top three key risks for your proposed technology.</p>		
<p><b>5. Experience and Skills</b></p> <ul style="list-style-type: none"> <li>• Please summarise the company's relevant experience in delivering projects and evidence relevant experience of the key personnel involved in the implementation of the technology.</li> <li>• Please demonstrate that you have the necessary industry and supply chain relationships in place in line with TRL7.</li> </ul>	<p>You should highlight the experience of your management and delivery team and key personnel within your organization (and any partner organisations) that are involved in the technology. This should focus on experience in technology management, technology commercialisation, business development and raising finance (i.e. loans, equity finance).</p> <p>You should detail any track record individuals involved or your business have in undertaking and exploiting the results of research and development projects, to show your capability to develop and exploit the technology.</p> <p>If you feel the incubation support aspect of the scheme might be able to provide additional skills or knowledge necessary for the successful post-pilot market scale up in Brazil of the technology, you should highlight these in this section.</p>	<p>To what extent does the organisation and delivery team have the right skills and experience to deliver the project's intended benefits to time and quality? Can any skills gaps be addressed by the incubation support?</p> <p>Has the delivery team been described?</p> <p>Are there any skills gaps, if so, is the applicant aware of them?</p>	<p>10</p>

	<p>You should explain any industry or supply chain relationships which are necessary, or which will help you to deliver this technology.</p> <p>You should demonstrate sufficient resource commitment and capability to undertake the technology, as described, with clear management reporting lines identified.</p>		
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**Signature of Applicant**

The Pre-Qualification Application must be signed by a suitable representative from the applicant (or lead organisation in the case of collaborative applications).

## Eligible Costs – for reference for the Full Application

In addition to the requirements of the EU Block Exemption Regulation, the grant can only cover eligible costs incurred and defrayed in the period between acceptance of the grant and the deadline specified in the grant offer letter for completion of the technology.

The definition of eligible costs includes the applicant's own costs, eligible costs incurred by consortium members and eligible costs incurred by companies connected to any of these. The cost of work contracted to connected companies, to consortium members or to companies connected to consortium members should be on the basis of eligible costs.

Costs must be denominated in GB pounds. Applicants should indicate where conversion has been made to GB pounds from other currencies and indicate the rate and assumptions used.

### List of Eligible Costs

Under Article 25(3) of the EU Block Exemption Regulation<sup>9</sup>, eligible costs are defined as the following:

- a) Personnel costs: researchers, technicians and other supporting staff to the extent employed on the technology;
- b) Costs of instruments and equipment to the extent and for the period used for the technology. Where such instruments and equipment are not used for their full life for the technology, only the depreciation costs corresponding to the life of the technology, as calculated on the basis of generally accepted accounting principles are considered as eligible;
- c) Costs for of buildings and land, to the extent and for the duration period used for the technology. With regard to buildings, only the depreciation costs corresponding to the life of the technology, as calculated on the basis of generally accepted accounting principles are considered as eligible. For land, costs of commercial transfer or actually incurred capital costs are eligible;
- d) Costs 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 technology;
- e) Additional overheads and other operating expenses, including costs of materials, supplies and similar products, incurred directly as a result of the technology.

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<sup>9</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN>

## List of Ineligible Costs

Under no circumstances can the grant be claimed or used:

- For activities of a political or exclusively religious nature;
- In respect of costs reimbursed or to be reimbursed by funding from other public authorities or from the private sector;
- In connection with the receipt of contributions in kind (a contribution in goods or services as opposed to money);
- To cover interest payments (including service charge payments for finance leases);
- For the giving of gifts to individuals, other than promotional items with a value no more than £10 a year to any one individual;
- For entertaining (entertaining for this purpose means anything that would be a taxable benefit to the person being entertained, according to current UK tax regulations);
- To pay statutory fines, criminal fines or penalties; or
- In respect of VAT that you are able to claim from HM Revenue and Customs.

## Staff Costs

We would not normally expect to see contractors in key posts, e.g. CEO, FD, etc. Exceptionally, where we are willing to fund a technology which includes contractors in key posts, the day rate attributable to the technology must be agreed at the outset in the full application and cannot be varied without written agreement.

## Appendix 1 - Technology Readiness Levels definitions

Technology Readiness Levels are an indication of the maturity stage of development of particular technology on its way to being developed for a particular application or product. Below are some broad definitions of the TRLs

### Research

#### TRL 1 – Basic Research

- Scientific research begins to be translated into applied research and development.

#### TRL 2 – Applied Research

- Basic physical principles are observed, practical applications of those characteristics can be 'invented' or identified. At this level, the application is still speculative: there is not experimental proof or detailed analysis to support the conjecture

### Industrial Research (guideline)

#### TRL 3 – Proof of Technical Concept

- Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include showing the performance of critical technical features or components are feasible (even if not yet integrated or representative of real-life environment).

#### TRL 4 – Lab and Test Bench Demonstrations

- Lab and Test Bench Demos of sub-systems & key components. Modelling & experimentation with parameters representing future conditions.

### Application proof-of-concept

#### TRL 5 – Development Prototypes

- The system, sub-system, components, or sub-scale units are integrated with reasonably realistic supporting elements so it can be tested in a simulated or representative environment.

### Experimental Development (guideline)

#### TRL 6 – Engineering or Engineering Prototype.

- Representative full-scale demonstration Prototype: full-scale prototype system is tested in a relevant system in representative conditions environment.

### **Proof-of-application**

#### TRL 7 – Operational Prototype (Alpha Product)

- Operational Prototype. Near or at planned operational system, requiring demonstration of an actual system prototype in an operational environment.

#### TRL 8 – System Incorporated in Commercial Design

- Production Prototype (or process). Technology is proven to work - technology design for production or roll-out is completed and qualified through test and demonstration.

#### TRL 9 – Marketable Product: proven in repeated use

- Actual application of technology is in its final form - Technology proven through successful operations.

**Adam Smith**  
International

