**Application Form B:**

**Technical Presentation**

Bioenergy subcategories c, d and e

The Project Sponsor should describe the key aspects of their Project in this Application Form.

The Project Sponsor should distinguish where elements of the Project have been confirmed and where further work is required to progress Project design. Where such further work will be undertaken during the course of the Project, the Project Sponsor should outline their process for doing so including the process for monitoring and managing associated risks. The Project Sponsor may include diagrams to support their descriptions.

This Application Form sets out the technical evidence that Project Sponsors are requested to provide in their responses.

It is recognised that there are a number of possible design options for the development of Plant and Associated Infrastructure. This Application Form asks for evidence which covers the breadth of possible design options and therefore certain sections may not be relevant for all technical submissions.

Those technology elements of the projects which are considered to be innovative should be described as such in the relevant sub-section below. Project Sponsors should include a justification as to why the technology meets the innovation criteria as listed in Application form F, section F.1 Eligibility. This can be provided in the relevant sub-section where each sub-section technology is described and further detailed in Section B.2, under the Innovation sub-section of this application form. Project Sponsors should include a description of how successful demonstration of their Project will enable commercial replication of the technology in other Projects.

For all responses to the following questions, please demonstrate your rationale behind technical solution over other options.

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#### ****Section B1: Executive Summary****

**B1. Project Sponsors should provide an overview of the elements of the Project.**

Technical summaries should be provided for:

1. Location of the Project.
2. The output of the Project in in normal cubic metres of biogas (expressed as both total gas and as methane) per year or litres of final product per year
3. Feedstock to be used and confirmation that sustainability criteria under Directive 2009/28/EC will be met for biofuel or bioliquid produced.
4. Summary of CO2 balance calculations (full lifecycle).
5. Feedstock source, logistics, on-site handling and pre-treatment.
6. Physical, Chemical and/or biological processes used to convert feedstock to gas or liquid product, including separation of product streams.
7. Composition and characteristics of final product(s) including calorific value and if applicable their further treatment requirements.
8. Current status of Project development.
9. Key phases in the Project’s lifecycle from Project Contract award onwards (e.g. design, construction, commissioning, testing and operation). This should include the key Project milestone dates.
10. The supply and off-take agreement for all products and raw materials concerned including the price formula, volume, cancellation, duration, etc.
11. The biofuel policy on the relevant off-take market including the main parameters (blending obligation, taxation, grants, etc.)
12. Key phases in the Project’s lifecycle from Project contract award onwards (e.g. design, construction, commissioning, testing and operation). This should include the key Project milestone dates.
13. Please describe any major elements of complexity of the Project (trans-boundary issues, institutional set up, organisation structure, crossing border infrastructure, technology, planning, design, externalities, etc.).

#### ****Section B2: Technical Scope****

## Technical Description

### Technical overview

An overview of the Project including a summary of the design including details of any Innovation proposed for each of the subsections described below.

### Biomass Handling and Availability

An overview of how biomass for the plant will be handled including:

1. Characterisation of feedstock. If new energy crop please also provide full agronomic characterisation and adaptation studies/ breeding program.
2. Sourcing areas, rotation (if applicable), expected crop/forest productivity,
3. Measures to ensure sustainability of feedstock: certification schemes and its level of implementation over sourcing areas.
4. Logistics management schemes, chain of custody and if applicable logistics of collection, storage and transport of feedstock.
5. Reception and unloading facilities.
6. Storage facilities including capacity.
7. Biomass treatment including any drying or size reduction.
8. Specifications for biomass both on reception and after treatment.
9. Transfer equipment including capacity and redundancy.

### Gasification

An overview of the gasification units including:

1. Gasifier design and operating principles.
2. Provision of air/oxygen/steam for gasification.
3. Gas composition produced.
4. Energy and utility requirements including any heat recovery.
5. Char handling and recycle.

### Gas cleaning/Conversion

1. Gas cleaning:

An overview of the gas cleaning unit including:

* 1. Design and operating principles
  2. Key unit operations and contaminants to be removed
  3. Gas composition before and after each operation
  4. Energy and utility requirements

1. Gas-to-Liquid / Gas to Gas [eg. methanation] Converter (if applicable)

An overview of the gas-to-liquid / methanation converter including:

1. Design and operating principles
2. Key unit operations
3. Energy and utility requirements
4. Expected output (liquid/gas) and its composition.
5. Liquid/Gas Treatment and Finishing (if applicable)

An overview of the raw liquid/gas treatment processes to produce the final product, including:

1. Design and operating principles
2. Key unit operations
3. Expected output liquid/gas composition
4. By-product streams
5. Power Generation (if applicable)

An overview of the power plant including:

1. Design performance, capability and availability of the power plant.
2. Turbine or engine, including specific design features to use the syngas or liquid produced by the plant.
3. Generator and electrical systems.
4. Substation and grid connection.

## Balances

### Overview of Utility Requirements

A description of overall Utility Requirements is required. This should include:

1. An estimate of supplementary fuels that may be required e.g. for plant start-up and how much energy these will be expected to provide in relation to the plant output.
2. An estimate of power requirements of the plant and the impact this will have on net electricity generation.
3. An indication of the heating/cooling demands of the plant and how these will be met.
4. An indication of water requirements and how these will be supplied.

### Waste Handling

A statement is required identifying by-product and waste streams and describing the appropriate handling and disposal provisions that would be implemented for each. If applicable, provide target emissions profiles to air and water.

### Heat & Mass Balance

A heat and mass balance should be provided for the Block Flow Diagram for the intended flows at normal operating output. For each stream number identified on the block flow diagram, the following information is expected:

1. Fluid description.
2. Mass and / or volumetric flow rate.
3. Phase.
4. Temperature.
5. Pressure.

### CO2 Balance (full lifecycle)

An estimate of CO2 savings as a result of the Project should be provided. This should clearly show how emissions have been calculated for the Project and for the fossil fuel reference used. Where possible the calculation should follow the principles and methodology used in Directive 2009/28/EC.

## Block Flow Diagram

A block flow diagram for the Project is required and should include the unit operations described in B2.2above.

## Existing Assets

1. Provide a list of any existing assets to be used for the Project.
2. Explain why use of existing assets is proposed. The Project Sponsor should demonstrate that any existing asset is available for use for the duration of the Project or provide discussion on what further action is required to secure the use of the assets for the Project. The Project Sponsor should explain the ownership of the assets and commercial arrangement for their use, and whether any other parties not directly associated with the Project will have any rights of access to the assets.
3. A summary of the life assessment survey(s) carried out to date, including the extent that these have covered the existing assets and the key findings.
4. Where existing assets will be operating under different conditions or in a different application, describe the implications and how they have been assessed. The Project Sponsor should include details of the current / previous process conditions where relevant.
5. A description of the validation, upgrade and life extension work is proposed to be undertaken during the Project for each existing asset.
6. A description of the process for resolving risks and uncertainty, including details of any further assessment work to be undertaken where the use of existing Installation is still to be confirmed, because:
   1. The ownership or the contractual basis for use of the assets is not fully established.
   2. The right to use the assets for their intended purpose in the Solution for the duration of the Project is not fully established.
   3. The use of the assets is dependent upon the outcome of further integrity assessment work.
7. The description should include:
8. A discussion of the risks associated with resolving any of the areas of uncertainty.
9. How the Project Sponsor proposes to mitigate these risks, e.g. in the event of delayed or unsuccessful outcomes.

## Technology specific paragraph: *not used for this sub-category*

## Innovation

1. Provide a list of any Innovative items or technologies used within the Project and associated infrastructure.
2. Explain how the Project Sponsor proposes to ensure that the risks and uncertainties associated with the Innovation are reduced or resolved.
3. Provide audited test run data and information for any experiences on pilot and demonstration plants.
4. A discussion covering the previous experience i.e. tests / plant experience to date and details of further development / testing required or planned. Describe where tests or experience will be obtained from other initiatives or will be produced during the Project.
5. What are the future applications of this innovation if it were to be proven? What additional renewable resource could be exploited as a result of this innovation over and above current commercially available technology?

#### ****Section B3 Plant Performance****

The Project Sponsor should present and justify the performance of the Project during the operational period relevant for NER300. The performance presented should be supported by a resource and energy yield assessment carried out following standard industrial practice.

**B3.1: Project Performance**

1. Project performance in MWh during first 5 years of operation:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Sum (year 1-5)** |
|  |  |  |  |  |  |

**B3.2: Resource and Energy Yield Assessment**

1. Table: Performance parameters (example in table)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Item** | **Unit** | **Y1** | **Y2** | **Y3** | **Y4** | **Y5** |
| Hour of operation | | h/y |  |  |  |  |  |
| Capacity utilisation | | % |  |  |  |  |  |
| Input | Biomass (xx% moisture) | t/yr |  |  |  |  |  |
| Output | Biofuel | t/yr |  |  |  |  |  |
|  | yield | t/t biomass input |  |  |  |  |  |
|  | Byproduct 1 | t/yr |  |  |  |  |  |
|  | yield | t/t biomass input |  |  |  |  |  |
|  | *HP steam (if applicable)* | *MWh/yr* |  |  |  |  |  |
|  | *yield* | *MWh-th/t wood input* |  |  |  |  |  |
|  | *MP steam (if applicable)* | *MWh/yr* |  |  |  |  |  |
|  | *yield* | *MWh-th/t wood input* |  |  |  |  |  |
|  | *Fly ash (if applicable* | *MWh/yr* |  |  |  |  |  |
|  | *yield* | *MWh-th/t wood input* |  |  |  |  |  |

1. Table: Indicative energy efficiencies calculated on the basis of energy content in the output vs. input (example in table)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | **Value in 2020** | | **Energy** |  | **Total** |
|  |  |  | | **content** |  | **energy** |
|  |  | Unit |  | LHV | Unit | GWh |
| **Output** | Biofuel | tonne |  |  | MWh/tonne |  |
|  | Byproduct 1 | tonne |  |  | MWh/tonne |  |
|  | *HP steam\** | *MWh* |  |  | *MWh/MWh* |  |
|  | *MP steam\** | *MWh* |  |  | *MWh/MWh* |  |
|  | *Fly ash\** | *MWh* |  |  | *MWh/MWh* |  |
|  | **Total** |  |  |  |  |  |
| **Input** | Feedstock biomass (xxx% moisture content) | tonne |  |  | MWh/tonne |  |
|  | Electricity | MWh |  |  | MWh/MWh |  |
|  | Gas | tonne |  |  | MWh/tonne |  |
|  | **Total** |  |  |  |  |  |
| **Efficiency** | Feedstock to biofuel output  on dry mass basis |  | % |  |  |  |
|  | Feedstock to biofuel output  on energy basis |  |  |  |  | % |
|  | Feedstock energy to total output energy |  |  |  |  | % |
|  | Input energy to total output energy |  |  |  |  | % |

1. Provide all data to substantiate values in table under section B2 above.

#### ****Section B4: Implementation****

The Project Sponsor is requested to provide the following:

* 1. **Current Project Status**

Project Sponsors should provide a summary of the extent of Project development and design work completed at the point of submission of the Application to the Member State.

* 1. **Project Management**

1. The proposed Project management plan including organisation, methodology and any applicable standards or processes to be used during the Project across the full Plant and associated infrastructure. Please explain the proposals for:
   * 1. cost control and management;
     2. progress control;
     3. key performance indicators;
     4. earned value management;
     5. management information systems;
     6. integration with financial management systems;
     7. design review and approval processes; and
     8. internal communications and reporting.
2. A description of the stakeholder management plan. Identify the key stakeholders for the Project and describe how the plan will be implemented in each case.
   1. **Resourcing and Supply Chain Plan**

The Project Sponsor should describe the key aspects of their strategy for procuring the services, supply and works contracts for the implementation of the Project. This to include:

1. A description of the specific resources, skills and services required for each stage of the Project and an explanation of the supply chain contracting philosophy for securing such services. Details of all major contractors/service providers already appointed should be provided together with proposals for how the remaining supply chain services will be procured.
2. A description of each the main contracts envisaged (scope, general conditions, commercial aspects);
3. The estimated value of each of these contracts;
4. The procurement procedure followed/to be followed, e.g. open procedures, restricted procedures, negotiated procedures;
5. The expected dates for: launching the tenders, signing the contracts and the contract execution schedule.
6. A summary of the envisaged guarantees to be provided under these contracts.
   1. **Quality Management**
7. The proposed approach to quality management in relation to the Project. The summary should detail the following:
8. details of any current, or applied for, industry recognised accreditations (e.g. ISO 9001) in the consortium;
9. the quality management procedures and policies that will be used throughout the Project
10. the proposal to cascade these arrangements down the Supply Chain; and
11. the measures that will be in place to monitor and control adherence to the proposed quality management procedures.
12. A description of the Project Sponsor’s internal contract delivery system and how this will ensure the scope of the Project is understood and clearly disseminated to all members of the delivery team.
13. The proposed approach to managing the development and integration of innovation during the Project. Explain what additional processes will be used to ensure that the risks and uncertainties associated with innovation are reduced or resolved.
    1. **Health, Safety and Environment**

**Health safety and environment outline**

1. An outline description of the proposed health, safety and environmental management systems, for the Plant and associated infrastructure.
2. A description of the Project Sponsor’s plan for compliance with all relevant legislation and regulations related to construction of the Solution.
3. Discussion of the health, safety and environmental related aspects of the operation and maintenance of the Project.

**Existing assets**

1. A discussion on the health and safety aspects of reuse of any existing assets within the Project.

**Note**: Health, Safety and Environmental Risk information is requested in Application Form E – Risk

* 1. **Governance**

Requirement: Project Sponsors are required to have sufficient control and governance arrangements in place to ensure the successful delivery of the Project. This is to ensure that EU funds are awarded appropriately to those projects which are able to meet the requirements set out in the Decision.

For each question below, where the governance arrangements are yet to be determined, the Project Sponsor should provide a narrative outlining its proposed plan to ensure appropriate governance arrangements are in place to ensure successful delivery of the Project.

The Project Sponsor is required to respond to the following questions:

1. Structure

Q1: Please indicate below the Project Sponsor’s proposed Project senior management structure, including senior Project management and integration roles, and include brief CVs of key staff who will be responsible for the Project. CVs should state the proposed role, professional qualifications and relevant experience.

| Name of senior bid team member | Role |
| --- | --- |
|  |  |
|  |  |

1. Advisors

Q2: To the extent that the Project Sponsor intends to use external advisors provide the names of proposed financial, legal and technical advisers.

If the Project Sponsor does not intend to use external advisors please explain why it believes this is not necessary.

| Name of adviser | Role | Registered / Principal office | Ultimate Parent. |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |

1. Experience of working together

Q3: If the Project Sponsor entities have experience of successfully working together on projects which are comparable or in otherwise relevant situations, please provide a brief summary within the table below. Projects should have reached contract close within the last 5 years.

| Companies involved | Project Description | Value (EURm) | Date and Location |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Q4: If the Project Sponsor entities do not have experience of working successfully together then the Project Sponsor should identify projects which are comparable, or otherwise relevant situations where they have worked successfully with other organisations. A brief summary of the Project and partners should be provided in the table below. Project should have reached contract close within the last 5 years.

| Relevant Companies | Project Description | Value (EURm) | Date and Location | Name and role of other organisations and contractual relationship |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1. Capable Client Function

By reference to previous experience please highlight you experience of and approach to:

Q5: Implementing appropriate governance structures and aligning the interests of a number of organisations to deliver projects of a relevant nature:

|  |
| --- |
|  |

Q6: Retaining overall responsibility for delivery given your proposed Project delivery structure:

|  |
| --- |
|  |

Q7: Effective supply chain management over the whole life of a project such as the one proposed:

|  |
| --- |
|  |

#### ****Section B5: Operation****

* 1. **Operating plan**

An operating plan which includes:

1. A discussion of the operational assumptions used by the Project Sponsor in developing their operating plan together with an assessment of how sensitive their Solution is to alternative operational assumptions.
2. The discussion should include an assessment of operational factors which may impact upon the Plant load factor.
3. Market assumptions used to support the Project Sponsor’s operating plan.
4. The sensitivity of the Project Sponsor’s operating plan to changing market conditions and how the Project Sponsor proposes to mitigate risk and uncertainty.
5. Whether the Plant is expected to show seasonal behaviour; including impact of weather on availability
6. Whether the arrangements are expected to vary from one year to the next.
   1. **Availability**

A statement of the anticipated availability of the Plant and associated infrastructure over the Project period, including a discussion of the key influencing factors.

* 1. **Maintenance**

An outline maintenance plan for the Project and associated infrastructure. This should include:

1. consideration of the maintenance requirements for each section of the Plant and associated infrastructure;
2. the expected impact of maintenance activities on the operation of the Plant and associated infrastructure, including typical durations for major, minor and, routine maintenance and;
3. capital expenditure plan required for maintenance activities for example vehicles and machinery, including a technical description of the plant and its suitability for the maintenance task, equipment suppliers and lead time to procure equipment.

#### **Se**ction B6: Time Schedule

The Project Sponsor should submit a Project Programme which is to include the programme for the consents, design, engineering, procurement, construction, erection, commissioning, operation, maintenance and decommissioning for the Project and associated infrastructure.

Industry standard software (eg Primavera, MS Project) shall be used for all programmes provided in response to this Application Form and the Project Sponsor shall provide the programmes electronically in readable pdf-documents.

The Project Sponsor is requested to provide the following:

1. **Summary Programme**

Summary programme in Gantt Chart format at monthly resolution with sufficient detail to indicate the Project Sponsor’s intention for executing the works for the Plant and associated infrastructure. This programme must show the key activities, events, dependencies and milestones including the following:

* + - 1. Further design work still to be undertaken i.e. FEED, detailed design etc.;
      2. Details of any activities required to secure funding from the Project Sponsor’s Member State government or any other funding organisation.
      3. Periods for obtaining key Project consents/licenses, including any potential impact of public inquiries if the requirement for a public inquiry is likely.
      4. Final investment decision of Project Sponsor
      5. Key stages of construction and commissioning including

1. site enabling works period;
2. civil works construction period;
3. mechanical and electrical erection /installation period;
4. commissioning period;
5. compliance / performance and reliability testing period;
   * + 1. Date of Entry into Operation;
       2. Work/activities which will only commence after award of NER300 application;
       3. Indication of timing of Member State or other funding source (including funding already committed and spent).
6. **Level 2 Project Programme**

An outline programme (Gantt Chart format) at level 2, and level 1 for the Plant and associated infrastructure in sufficient detail to indicate the Project Sponsor’s intention for executing the Project. This programme must clearly show the dependencies between the major items relating to consenting, funding (including key investment decision(s)) FEED, design / engineering, procurement, manufacture, site enabling, civil construction, mechanical erection, electrical and control and instrumentation installation, commissioning, compliance / performance and reliability testing.

* + - 1. Level 1 - Summary including Plant, and associated infrastructure, including phase of work (consenting, investment, engineering, procurement etc.)
      2. Level 2 – Detailed summary including the Plant and associated infrastructure, including, phase (consenting, investment, engineering, procurement etc.), discipline (civil, mechanical, electrical etc.) and system (foundations, cabling, substation etc.). As a guide it is anticipated that no activity will be longer than 60 days, with the exception of procurement / manufacturing.

1. FEED and detailed design activities for each section of the full Plant and associated infrastructure including expected start date and durations;
2. anticipated dates of application and award dates are to be shown for consents;
3. long lead manufacturing items shall be identified for each section including expected start date and durations. Expected start & end dates to design and produce tender package documents are to be shown along with expected bidding, negotiation and selection periods;
4. dates for placing the main sub-contracts shall be identified including expected start and end dates to design and produce tender package documents along with expected bidding, negotiation and selection periods;
5. the programme shall be fully logic linked to show the detailed timing of all activities and to provide a comprehensive critical path(s). The critical path(s) shall be clearly marked;
6. the programme shall identify the key regulatory, commercial, technical and commissioning milestones and interface events including dates for access and release of terminal points. These interface events shall be integrated into the programme logic and should be included in a summary section at the beginning of the programme;
7. a supporting narrative is required describing the Project Programme execution strategy, anticipated main funding drawdown milestones and critical path; and
8. dates for key investment decisions including a supporting narrative stating where funding will come from, when funding will come available and if it is contingent on other factors.