

## Invitation to a Joint Call on Clean Biomass Combustion

This document is an invitation to take part in a joint call by the ERA-NET-Bioenergy partners from Austria, Denmark, Finland, France, Ireland, Poland and Sweden. The topic of the call is clean biomass combustion.

ERA-NET Bioenergy is a network of national R&D programmes focusing on bioenergy. The network includes 14 funding organisations from 10 European countries. ERA-NET Bioenergy is a project that has a duration of 5,5 years and will end in May 2010. The principal objectives of our joint calls are to provide additional value to all partner countries by actively supporting transnational research and knowledge exchange, and to continuously assess and improve the relevant procedures. With this specific call, the funding agencies are also aiming to provide a platform for information exchange related to clean biomass combustion in different countries through workshops and other dissemination activities.

**The joint call will open on 9<sup>th</sup> February 2009 and will close on 30<sup>th</sup> April 2009.**

**This call will be published on the ERA-NET Bioenergy web page and on the web pages of the national programmes.**

See: [www.ernetbioenergy.net](http://www.ernetbioenergy.net)

### Background

The European Commission actively supports the use of biomass for energy as part of the European Union aim to increase the use of renewable energy and to avoid an increase in atmospheric CO<sub>2</sub> concentrations. The European Union and its Member States recently decided to set a target of 20% CO<sub>2</sub> reduction and 20% renewable energy for the year 2020. Bioenergy is the greatest contributor to the EU's renewable energy strategy, since it represented 61% of the EU 15's renewable energy consumption in 2001. Bioenergy, however, currently contributes only 3.8% to the EU 15's total energy consumption, which is far from its potential. By enhancing research co-operation and co-ordination on a European level, ERA-NET Bioenergy aims to strengthen European efforts to realise the potential of renewable energy production from biomass and meet the ambitious 2020 targets.

The issue of air quality is also a major concern and one of the areas in which the EU has been most active. As the result of EU legislation, much progress has been made in tackling air pollutants such as sulphur dioxide, lead, nitrogen oxides, carbon monoxide and benzene. However, despite a reduction in some harmful emissions, air quality continues to cause problems, such as health risks from fine particles. The new European Parliament and Council Directive 2008/50/EC on ambient air quality and cleaner air for Europe entered into force on 11<sup>th</sup> June 2008. It includes the following key elements: the merging of most of existing legislation into a single directive and new air quality objectives<sup>1</sup> for PM<sub>2.5</sub> (fine particles). The Thematic Strategy on Air Pollution from the Commission to the Council and the European Parliament (2005)<sup>2</sup> also identified required efforts and commitments by various sectors (energy, transport and agriculture). Within the energy sector, the Strategy mentions small-scale combustion, with increasingly important emissions which are not regulated at Community level, and domestic combustion appliances and their fuels, for which with harmonised technical standards and measures for clean combustion of biomass are to be developed.

<sup>1</sup> New exposure concentration obligation and exposure reduction target

<sup>2</sup> Brussels, 21.9.2005, COM(2005) 446 final

The ERA-NET Bioenergy partners agree that bioenergy can only develop if it is a source of cleaner, more secure and sustainable energy. Clean biomass combustion is a pertinent and sustainable way to ensure a renewable energy supply and improved air quality. It is also a prerequisite for an significant extension of biomass use for power and heat production. This means that, with a view to an increasing demand for new agricultural solid fuels, pollutant emissions must be reduced. Clean biomass combustion will have to be applied to all kinds of biofuels, and to all scales from residential to large-scale heating systems as well as to combined heat and power production, in order to lower air emissions such as fine particulate matter (PM2.5), nitrogen oxides and organic compounds.

Major coordinated R&D efforts are required to achieve sound clean biomass combustion solutions. In the frame of this call, four topics were identified by ERA-NET Bioenergy members as their top priorities for joint research co-operation (see the section "Joint call topic"). A high-cost efficiency of public fund spending with outstanding quality of results is required in all topics. Within only few years, R&D results will have to be industrially and commercially implemented in order to meet the 2020 target of 20% renewable energy.

Most of the current research activities on clean biomass combustion are funded by national programmes. The objectives, the topics, the budgets and the qualifications of the partners involved in the projects, however, may vary from one country to another. International and European co-operation and co-ordination of research activities on clean biomass combustion are limited and restricted to some bilateral programmes.

On an international level, within the IEA Bioenergy agreement<sup>3</sup>, Task 32 "Biomass Combustion and Co-firing"<sup>4</sup> aims at the exchange of highly relevant R&D results on biomass combustion and cofiring through industry in its member countries in order to expand the use of biomass combustion for heat and power generation on different capacities. Task 32 emphasises market introduction with the goal of expanding the use of biomass combustion in the short term and optimising its technology in the long term. Task 32 does not carry out any joint R&D programming and funding.

On a European level, in the framework of ERA-NET Bioenergy, a joint call was published in 2006 concentrating on the topic of small-scale combustion<sup>5</sup>. Clean combustion was one of the four areas of research identified in the call. Five projects were funded. These projects ended in summer 2008, and ERA-NET Bioenergy organised a public end conference on 10<sup>th</sup> September 2008 in Potsdam (Germany) during which the consortia were able to present and discuss their results, as well as future research needs<sup>6</sup>. Conference participants agreed on the need for further collaborative research activities on clean biomass combustion.

Joint working on clean biomass combustion between European researchers and industries, in the framework of ERA-NET Bioenergy, is a unique opportunity to achieve both: more renewable energy production with use of sustainable biofuels as well as cleaner air.

## **Aim of the call**

The aim of the call is to generate joint European industrially relevant research and development activities within ERA-NET Bioenergy participating countries. This call builds on the experience that was gained in the previous three joint calls (on small-scale combustion, on cleaning of product gas from biomass gasification and on short rotation coppice). This call provides new opportunities for industries and researchers to take part in multilateral cooperation in the field of clean biomass combustion and to enhance the quality of the conducted research. Projects are expected to provide knowledge through research in order to develop solutions which are economically competitive, reliable and environmentally friendly both in terms of energy efficiency, residual products and air emissions.

Projects must contribute to significantly lowering air emissions from solid biomass combustion.

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<sup>3</sup> IEA Bioenergy, which was set up in 1978 by the International Energy Agency (IEA), aims at improving cooperation and information exchange between countries that have national programmes in bioenergy research, development and deployment.

<sup>4</sup> The country participation includes European Commission, Australia, Austria, Belgium, Canada, Denmark, Germany, Netherlands, Norway, Sweden, Switzerland, and United Kingdom.

<sup>5</sup> The call was targeted at research institutions from Austria, Finland, Germany, Sweden and the UK

<sup>6</sup> All the presentations can be found at the events section of the ERA-NET Bioenergy website (<http://www.eranetbioenergy.net/>)

## Joint call topics

Due to budgetary restrictions and participating countries' different priorities, the content of the joint call is restricted to four topics. Note that not all countries participate in all topics of the call, i.e. organisations can only apply for projects in a specific topic if there is a financing national body (see table below).

Combustion of liquid and gaseous biofuels is outside the scope of the call. The call is restricted to R&D projects applying to the combustion of solid biofuels and mixtures of solid biofuels. Biofuels relevant to this call are forestry and agricultural solid biofuels, as well as waste-derived biofuels.

Some countries are primarily interested in clean biomass combustion on smaller scales than mentioned below. For details, please contact your national agency.

Proposals should be submitted within one of the four topics below:

- **Topic 1: Modelling of the combustion process**  
The overall objective of projects within this topic is to contribute to improved biomass combustion with significantly lower air emissions by way of novel modelling of the combustion process. Models on fluid dynamics, thermodynamics, chemical reactions and gas phase reactions will be used to optimise primary measures for clean combustion.  
Projects shall provide technical and economic benefits to biomass combustion units on all scales, i.e. from residential heating to large combustion plants and thus improve on the state of the art.
- **Topic 2: Advanced characterisation and relevant standardisation of biofuels**  
The overall objective of projects within this topic is to provide operators with information on biofuels characteristics in order to decrease emissions. Advanced characterisation will be studied, and all types of fuels can be considered, including agricultural fuels, agricultural and forestry residues, organic waste materials, raw and treated biofuels (e.g. torrefaction, additives).  
Projects shall provide benefit to biomass combustion units on all scales, i.e. from residential heating to large combustion plants. Such benefit could e.g. concern improvements in design or operating characteristics.
- **Topic 3: Technology development for fine particle and NO<sub>x</sub> reduction (< 20 MW<sub>th</sub>)**  
The overall objective of projects within this topic is to find innovative and close to market solutions that significantly reduce fine particle (PM<sub>2.5</sub>) and NO<sub>x</sub> emissions, as well as other mineral or organic compounds (e.g. CO, OGC, PAH, PCDD/F). Projects will focus on the development of new technologies going beyond the state of the art and will investigate primary or (and) secondary measures, and process control. Development of new biofuel pre-treatment technology that fit the above air-quality objective is eligible and can be considered as a primary measure. The development of standard European measurement methods of fine particles is also eligible. Cost effectiveness and economic aspects of new solutions must be studied.  
Within this topic, projects concerning clean heat production and combined heat and power production below 20 MW<sub>th</sub>, i.e. in the residential sector, will be considered. This comprises household boilers, fireplaces and stoves, as well as communal and industrial combustion plants.
- **Topic 4: Health effects of small scale combustion (< 3 MW<sub>th</sub>)**  
The overall objective of projects within this topic is to supply new sets of valuable information on the health effects of biomass combustion.  
Projects results must contribute to assessing the development potential of clean biomass combustion, by taking into account human health risks, and to a clarification of the hazardous potentials of solid biofuels in different heating systems.  
Projects must focus on the pollutants emitted from small-scale solid biomass combustion below 3 MW<sub>th</sub> only. This includes residential heating, with a special focus on fine particulate emissions.

Table: List of participating countries per topic; at least three participating countries per project is required; organisations can only apply for projects in a specific topic if their financing national body participates in the topic.

Topic	FI	SE	PL	DK	IR	AT	FR
<b>1. Modelling of the combustion process</b>	Yes	Yes	Yes	Yes	No	Yes	No
<b>2. Advanced characterisation of new biofuels</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>3. Technology development for particles and NOx reduction</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>4. Health effects of small scale combustion</b>	Yes	Yes	Yes	No	No	Yes	Yes

## General instructions for proposers

### Consortium

Proposals are invited from companies and/or research organisations depending on national funding conditions. Be aware that national criteria apply!

Proposals must include partners from **at least three of the countries** involved in the call. The partners should cooperate and the results of the project should be dependent on the work of the partners. Project outputs are expected to provide benefits to all partner countries.

**At least one industry** partner must participate in the consortium.

Partners from countries which are not members of ERA-NET Bioenergy are also encouraged to join a consortium (as additional members, the minimum number of three partners from ERA-NET Bioenergy countries remains). These so-called "associate partners" must seek funding for their activities individually, as the ERA-Net Bioenergy members will not provide for it.

The project partners are required to sign a consortium agreement in order to agree on Intellectual Property Rights (IPR) and other relevant issues dealing with responsibilities within the project and exploitation of results. The consortium agreement must be signed before the first payment can be made.

Please contact your national funding agency for information on potential partners in the other countries.

### Funding arrangements

Research will be funded from national sources and will be subject to national funding rules. Each participating funding agency has made separate arrangements for funding the national participants. The amount of public funding available for individual projects depends on the relevant national rules. Additional co-financing from stakeholders is expected following national and European rules for R&D funding. The total funding budget is limited. For details please contact your national funding agency.

### Project duration

Projects are expected to start between **September 2009 and November 2009** and must be completed by **30<sup>th</sup> November 2012**.

### Deadline for submission

Proposals must be received (i.e. the relevant date is that of the agency's receipt stamp, not the post mark) by your participating national funding agency by **30<sup>th</sup> April 2009** at the latest. It is the responsibility of each applicant to ensure their documents are submitted on time.

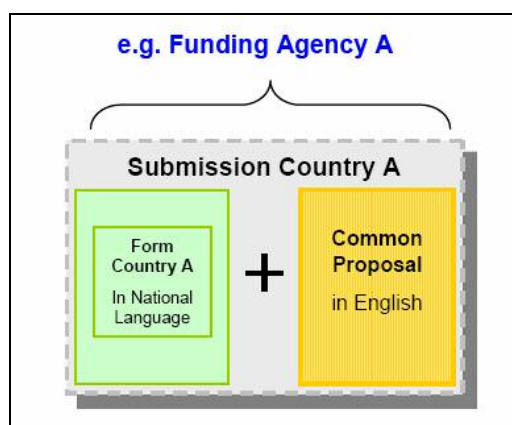
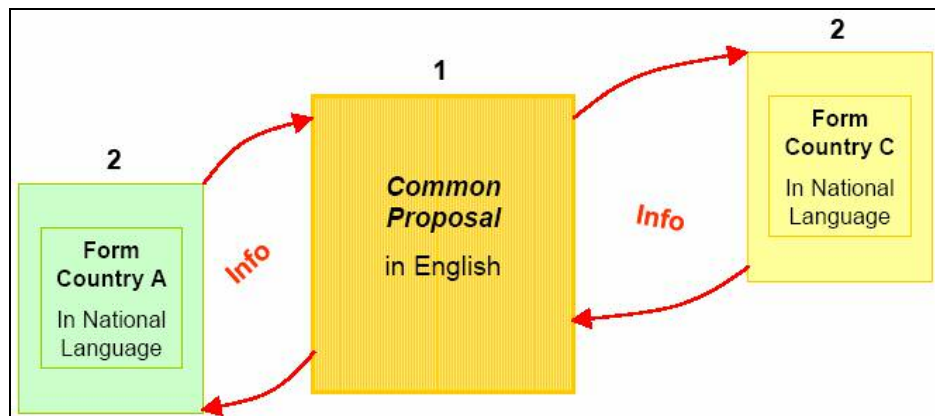
### Structure of submission

The documentation you have to submit to your national funding agency consists of two parts.

1) **A common proposal** written in English which contains all relevant information about the project. This will be evaluated as one entity by an international jury and will form the basis for their judgement. The common proposal must be in only one version for the whole consortium.

2) **A standard application form** from your funding agency describing the involvement and funding requirements of each national proposer. The information within this document should be extracted from the Common proposal as these documents will not be seen by the international jury.

These documents should be submitted by each project partner to their participating national funding agency (see list of national contacts below).



### **Structure of common proposal**

The Common Proposal document should be structured as follows:

1. Project title (max. 150 characters).
2. Duration in months (considering that project work must be completed by 30<sup>th</sup> of November 2012 at the latest).
3. Name of coordinator of the project.
4. Applicant details (institution, name of contact person, contact information).
5. Financial summary table – totals only, (in €) for overall costs, costs per partner, required national funding per partner.
6. Executive summary (about 300 words).
7. Detailed description of consortium (role of each partner organisation and stakeholders involved).
8. Detailed project description (objectives, materials and methods, state of the art and innovative contribution of the project, project management incl. work packages and milestones, together with details of assigned resources/man-hours and associated budgets (max. 15 pages).
9. Project outcomes (implementation and exploitation plan, implementation should involve all participating countries) (max. 3 pages).
10. Background and competences of participating organisations and individuals (max. 1 page per partner organisation plus ½ page per key person involved).
11. "Affirmation sheet", filled in and signed. The form can be downloaded on the ERA-NET Bioenergy website and the national agency's sites.

The proposal should be written using the Times New Roman font with a minimum acceptable font size of 10.

### **Proposal evaluation**

The proposals will be evaluated by an international evaluation jury, selected by the funding organisations involved in the call. The international evaluation jury will provide recommendations for funding. The final decisions will be made by the ERA-NET Bioenergy partners.

The evaluation of proposals will take place during June 2009 and the funding decisions will be communicated during July 2009.

The evaluation criteria are:

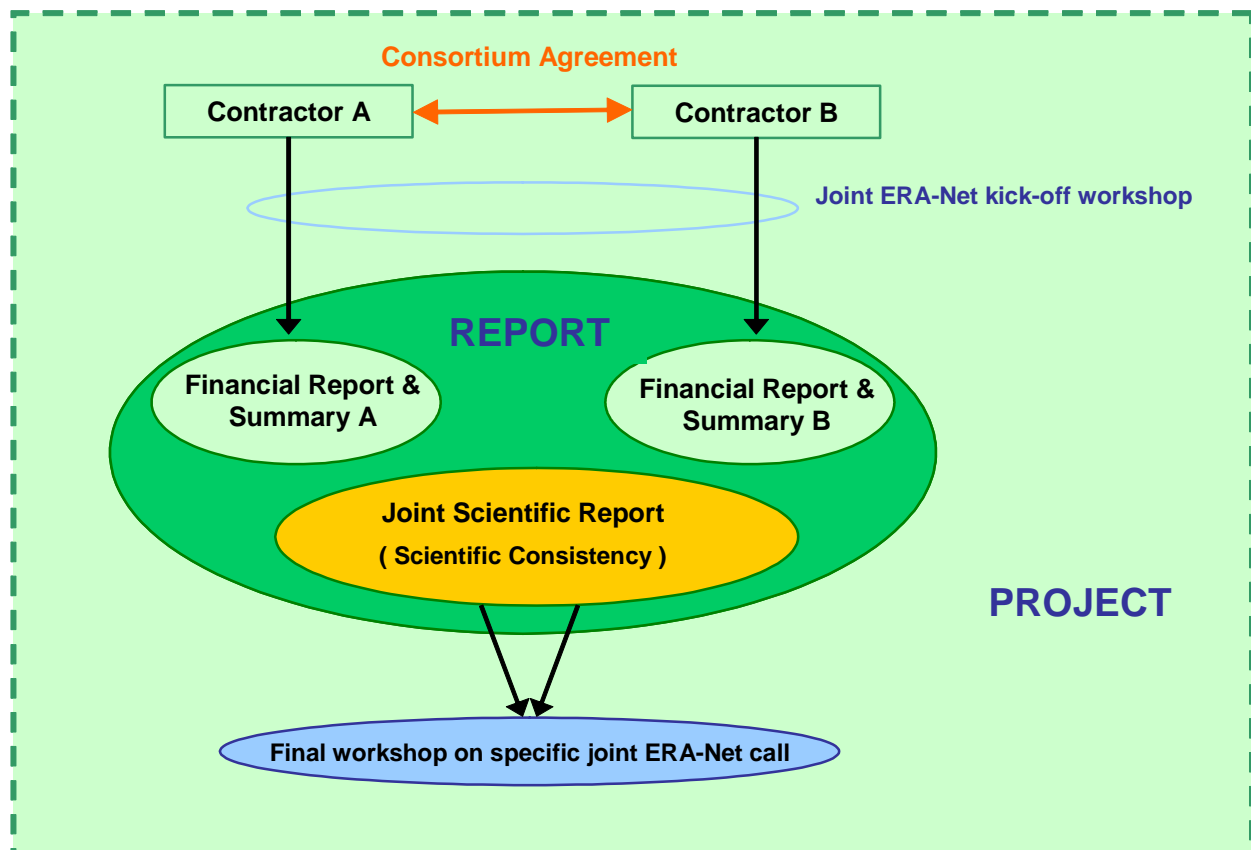
- Fit to call
- Technological and scientific quality of R&D (including why specifically the international cooperation improves the quality of the results)
- Implementation and exploitation of results (an appropriate implementation will be crucial for evaluation, e.g. describing industry involvement if type/topic of project calls for it)
- Resources available for the project, including quality of project management and coordination
- Promoting cooperation within the ERA-NET Bioenergy framework.

Beyond these instructions above, your participating national funding agency's guidelines should be followed.

### **Project monitoring and expected deliverables**

In addition to the standard requirements of your funding agency, ERA-NET Bioenergy requires the following:

1. Participation in and presentation at two joint ERA-NET workshops (kick-off and end workshops).
2. A common publishable and public Final Report (written in English), describing the main activities and outcomes of the work including an exploitation plan stating how the results of the project will be implemented. Confidential results will be presented in a separate confidential report. National guidelines have to be followed as well. Detailed requirements for this report will be distributed to successful applicants once the projects have started.



## **Participating countries / National contact points**

### **Austria**

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