



ERA-NET Bioenergy

POWERING BIOENERGY RESEARCH






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A photograph of a large field of yellow rapeseed flowers in bloom. The flowers are in the foreground and middle ground, with their green stems visible. The background is a clear, bright blue sky. The text is overlaid on the sky portion of the image.

**a source of cleaner, more secure and
sustainable energy for Europe**

Foreword

In 2002 the ERA-NET scheme was launched as part of the Sixth Framework Programme (FP6, 2002-2006). It was a brand new instrument developed and financed by the European Commission to foster the coordination and cooperation between national and regional research programmes. This move was based on the firm knowledge that Europe had all the resources required to build the largest, most competitive knowledge-based economy in the world, but required an initiative to unlock and ignite this potential.

Targeted to exploit opportunities and overcome barriers existing between national research systems in Europe, the scheme has increased the efficiency and coherence of European research by bringing together research programme managers and programme owners from across Europe. During FP6, more than 71 ERA-NETS were established covering all aspects of scientific research

This booklet presents the common achievements of European research ministries and funding agencies in one specific scientific area, that of bioenergy, as carried out under the auspices of the ERA-NET Bioenergy.

Within this project, a number of transnational activities have been developed, including the launching of transnational calls for research projects. These calls have resulted in the establishment of numerous, ambitious, international and interdisciplinary initiatives, which are being financed solely from jointly administered national funds.

It goes without saying that ERA-NET Bioenergy and its stakeholders have made a valuable contribution to the integration of research in bioenergy in Europe. I am convinced that the foundations laid down by this ERA-NET will serve well to build on efficient and attractive European Research Area.

Raphaël Laurent

Bioenergy Project Officer, European Commission



Raphaël Laurent

Bioenergy Project Officer,
European Commission, DG Research



Introduction



Kees Kwant

NL Agency, the Netherlands

Project Coordinator ERA-NET Bioenergy

A sustainable energy supply is crucial for our society, now and in the future. A major transition will be required to shift from the existing fossil fuel-based society to a more renewable energy based society. Several initiatives on a political level, such as the Renewable Energy Directive 2009/28/EC with the 20% goals for 2020, show that we are all aware of this need, and the first steps for implementation will be taken. Bioenergy is an essential component in this, and is expected to contribute more than 50% to the targets of this Directive by 2020.

Innovation and further Research and Development are crucial to improve the market place and sustainability of bioenergy. Cost effectiveness and conversion efficiencies can and need to be increased, and advanced technologies will improve the overall environmental impact. This development requires close collaboration on a European level.

It is in this respect of European collaboration that ERA-NET Bioenergy has offered support over the last years. In the new European Strategic Energy Technology Plan (SET-Plan), the European Commission adopts a transnational approach for jointly developing technologies and implementing them. The European Industrial Bioenergy Initiative has developed seven value chains in which demonstration projects will enable a position for bioenergy in the future. Together with the European Energy Research Alliance, ERA-NET Bioenergy can be seen as a tool on the funding side to further developing this European Research Area in bioenergy. Especially in a time of economic crisis with limited budgets, cost-effective Research and Development are crucial, and through European collaboration in ERA-NET Bioenergy it is possible to achieve this cost-effectiveness.

Results up until now have shown that cooperation on the funding side is possible, and that budgets from national programmes can be used to finance collaborative European projects. This brochure presents the results of the ERA-NET Bioenergy project between 2004 – 2010.

These results would not have been possible without all the hard work carried out by my colleagues from the partnering agencies. Their skills and endurance have been the key to success and have also created a platform of cooperation for years to come.

Many thanks go to Karen Görner, Verena Foth and Birger Kerckow (FNR), Martina Ammer and Michael Hübner (BMVIT), Karin Hollaus (FFG), Andreas Indinger (Austrian Energy Agency), Pia Salokoski and Marjatta Aarniala (Tekes), Rebecca van Leeuwen-Jones and Matté Brijder (NL Agency), Lise Nielson and Steen Vestervang (Energienet.dk), Hayley Dash, Neil Bateman (EPSRC) and Gary Shanahan (BERR), Anna Ostapczuk (NCBiR), Åsa Karlsson and Björn Telenius (Swedish Energy Agency), Erwan Autret and Jean-Christophe Pouet (ADEME), Pearse Buckley (SEAI), and all others who have contributed to this success. Sincere thanks also go to our project officers at the European Commission, Zsuzsanna König and Raphaël Laurent, and of course to the members of our Management Board for all their valuable advice.


ERA-NET Bioenergy is ready and available to support the national programmes in the future, based on national funding of the cooperation. If the European Commission so wishes we could expand and support the implementation of the ERA and industry in the SET-Plan initiatives on a much broader scale in the future.



Kees Kwant

Project Coordinator ERA-NET Bioenergy



A close-up, low-angle shot of green grass blades reaching upwards against a clear blue sky. The grass is in sharp focus in the foreground, with some blades slightly blurred, creating a sense of depth. The lighting is bright, suggesting a sunny day.

ERA-NET Bioenergy's mission is to enhance the quality and cost-effectiveness of European bioenergy research programmes, through coordination and cooperation between EU Member States.

About ERA-NET Bioenergy

Pulling bioenergy research together

What is ERA-NET Bioenergy?

ERA-NET Bioenergy is a European network devoted to a structured cooperation of Member State national agencies and Ministries, responsible for coordinating and funding national research efforts in bioenergy. Collaborative research efforts not only lead to higher quality, but also to cost-effective results, contributing to a greener and more secure energy infrastructure, thus preserving valuable fossil fuels for generations to come.

The European strategy for renewable energy resources identifies bioenergy as the most important renewable energy source for the future – a source of cleaner, more secure and sustainable energy for Europe. Bioenergy is a highly diverse area: crops are converted to biofuels for transport; agricultural residues are converted to biogas and forestry residues or municipal waste are used to produce electricity and heat.

Driven by the potential benefits of bioenergy, and guided by the renewable energy targets, there are many national and regional bioenergy research programmes running in Europe. In 2007, the total R&D investment in bioenergy for the EU Member States reached €245 million¹. A major part of this investment comes from the ten Member States which form the ERA-NET Bioenergy network.

Goal

The goal of ERA-NET Bioenergy is to strengthen national bioenergy research programmes through enhancing cooperation and coordination between national agencies. Through collaboration, the individual national programmes aim to produce higher quality results, while through coordination, they seek to

complement each other, avoiding duplication.

To achieve these goals a structure for the systematic exchange of information has been set up and a number of joint actions, workshops and joint calls have been launched.

Main Stakeholders

The ERA-NET Bioenergy consortium consists of organisations that finance or manage national research activities with respect to bioenergy. These can be divided into:

- PROGRAMME OWNERS (financing the programme is located at Ministry level in most countries);
- PROGRAMME MANAGERS (governmental agencies or public bodies with similar mandates who manage the programmes. Most programme managers in the consortium are related to a “mother” Ministry, either directly (as an agency) or indirectly (as in a public or private body that manages a bioenergy programme on behalf of the government).

The involvement of all 3 elements (Ministries, agencies and programmes) is essential. If one of the basic elements is missing in any one country, it will have a major impact on possibilities to implement a joint programme. Without the involvement of the Ministries, there is no political commitment. Without the involvement of the agencies and programmes, there is no commitment with respect to content.

Although companies, research institutes and universities are not part of ERA-NET Bioenergy, their involvement is essential for the success of the coordination since they are the target groups of the RTD programmes involved.

¹ European Commission 2010: Strategic energy technology plan information system, <http://setis.ec.europa.eu/mapping-overview/capacity-map/analyses/2009/report/results-on-biofuels>, accessed 19.04.2010.

Partners of the ERA-NET Bioenergy project



AUSTRIA

Federal Ministry of Transport,
Innovation and Technology



Bundesministerium für
Ernährung, Landwirtschaft
und Verbraucherschutz

GERMANY

Federal Ministry of Food,
Agriculture and Consumer
Protection (BMELV)



AUSTRIA

Austrian Research
Promotion Agency (FFG)



IRELAND

Sustainable Energy
Authority of Ireland



AUSTRIA

Austrian Energy Agency



NL Agency
Ministry of Economic Affairs

THE NETHERLANDS

NL Agency
Ministry of Economic Affairs



DENMARK

Energinet Denmark



Narodowe Centrum
Badań i Rozwoju

POLAND

National Centre for
Research and Development



FINLAND

National Technology Agency
of Finland (TEKES)



FRANCE

French Environment and
Energy Management Agency



Swedish Energy Agency

SWEDEN

Swedish Energy
Agency



GERMANY

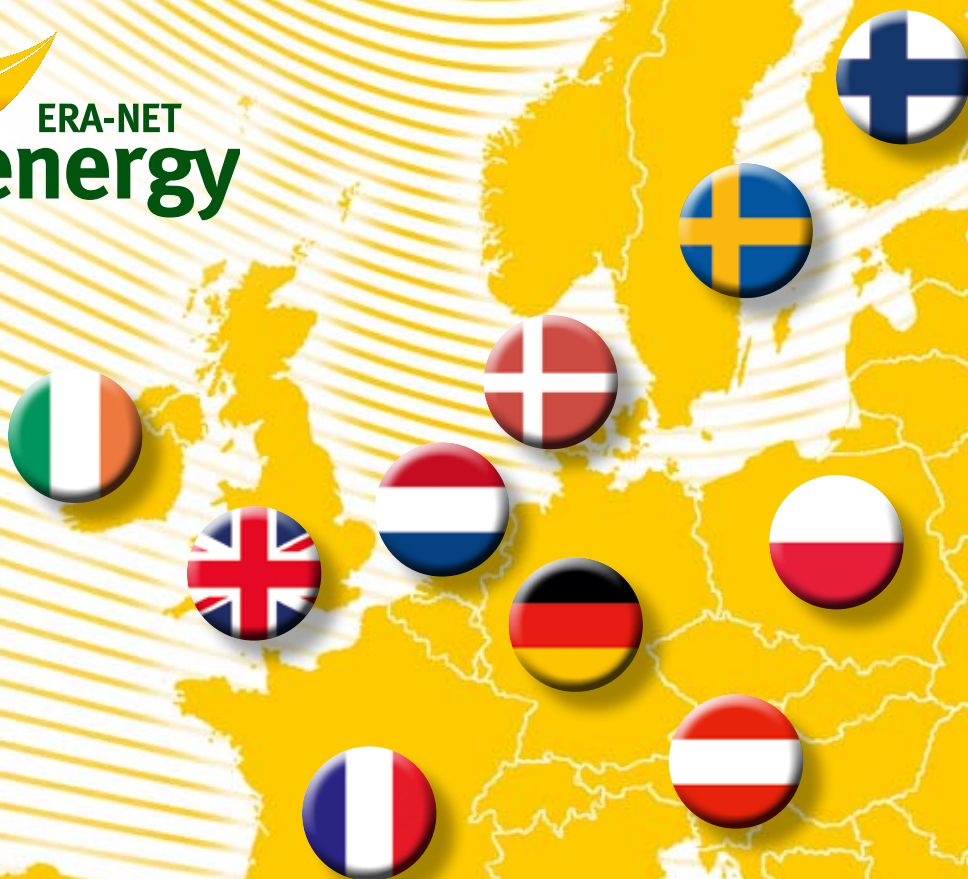
Agency for Renewable
Resources (FNR)



Engineering and Physical Sciences
Research Council

UNITED KINGDOM

Engineering and Physical
Sciences Research Council

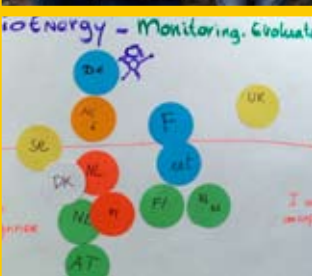


THE RESULTS



Joint Call X

- A Breeding for SRC Björn
- B Environmental aspects SRC Václav
- C [Storage/drying of lignocellulose] study on business models





Information Exchange

An important element of ERA-NET Bioenergy is information exchange. In order to achieve a continuous structured and systematic exchange of national programme information, a whole range of actions has been implemented including the following:

www.eranetbioenergy.net

An interactive website was launched right at the beginning of ERA-NET Bioenergy. The site offers the possibility for Partners to upload and update information themselves, launch new calls and to disseminate the results of research projects. This has been a most effective way of keeping the site up to date, interesting and relevant.

Country updates

At each Project Committee meeting Partners update each other with regard to bioenergy-relevant R&D projects, new legislation and policies in their respective countries. These brief presentations are then uploaded to the website after the meetings.

ERA-NET Bioenergy Bulletin

Digital newsletter bringing our stakeholders up to date with the latest developments in ERA-NET Bioenergy. This bulletin has a wide readership including registries to the website and is disseminated by the Partners in their respective countries.

Personnel Exchange visits

The network organised a number of successful personnel exchange visits in the Netherlands, Finland, Sweden and Germany. The main goal of the exchange visit in the Netherlands, for example, was to learn more about energy research policy and implementation in the Netherlands. Participants were asked to help evaluate the Dutch programme, based on a simple questionnaire. Participants were enthusiastic about the exchange visit and were particularly impressed by the Dutch transition approach.

"Very innovative and interesting approach, well done".

"My impression is that The Netherlands has created a system which will be of great value to both the Ministry and SenterNovem (now NL Agency)".

Amongst the suggestions made for improvement were the following:

"More materials would be nice; especially websites in English (transition paths....); there is little to hide (from your side) and a lot to learn (for the rest of us)".

"The in-house evaluation of the research projects should be done in a large group with experts from different fields".

Expert Workshops

Expert workshops were held on a wide range of bioenergy-related topics also including priority setting and monitoring, mostly aiming at developing new joint calls.

The Results

Information Exchange Examples

Short Rotation Coppice Workshop June 2007, Berlin

In June 2007, an expert workshop on Short Rotation Coppice (SRC) was held in Berlin. This was a most fruitful meeting which revealed how diverse countries are in their research efforts on SRC. For example, some countries emphasise willow in their R&D strategies, others poplar; in some countries, a suitable supply chain infrastructure for SRC products has already been developed while in others this is one prime obstacle. Sweden is the only country to have a dedicated programme for bioenergy feedstocks.

Despite so many differences, the participants succeeded in identifying the following topics of common interest:

1. Genetics/breeding of SRC species;
2. Value chain of SRC: harvesting/logistics and other supply chain issues;
3. Environmental aspects of SRC;
4. Economic potential.

Information exchange on the topic of economic potential of SRC was an immediate follow-up of the workshop. Opportunities for networking on the topic "Value chain" were seized at an SRC workshop in Germany in October 2007.



Finally, the ERA-NET Bioenergy workshop proved there was real interest in a number of Member States to take three of the topics further. Thus, the Partners decided to expand their activities on these topics beyond networking and set up an ERA-NET Bioenergy Joint Call.

In January 2008, ERA-NET Bioenergy achieved the milestone of launching its third joint call, on the topic of Short Rotation Coppice (SRC). The call aimed to generate joint European research and development activities in the following three areas:

1. Genetic improvement of Salix and other woody SRC species;
2. Improving the value chain of SRC;
3. Environmental aspects of SRC.





Conference Amsterdam 2008

Collaboration with IEA Bioenergy Task 42 on Biorefinery:

A joint workshop between ERA-NET Bioenergy representatives and representatives from IEA Bioenergy Task 42 was held in September 2009 to identify topics in the biorefinery field that could be considered by ERA-NET Bioenergy for a joint call.



Collaboration with the Technology Platform on Biofuels:

A joint meeting held in March 2009 focused in particular on biofuels and biomass pre-treatment and investigated further the need for cooperation between European industries and Member States, and how to realise this. It provided a good starting point in an attempt to adapt to the new European research panorama. The joint meeting led to a focussed result and according to José Espi Ruiz from DG TREN, who also participated in the meeting *"We are on the right track; these ideas fit in with the Strategic Energy Technology (SET) Plan"*.



In addition ERA-NET Bioenergy has launched a number of promotional dissemination actions such as the Conference in Amsterdam in November 2008, fliers, posters and keynote addresses at various bioenergy-related conferences such as the European Biomass Conference.

The Results

The Joint Calls Results & Success Stories

Joint Call	Year	Project total cost M €	Funding M €	Number of projects
1. Small Scale Combustion	2006	1.9	1.7	5
2. Gasification Gas Cleaning	2007	4.6	3.7	6
3. Short Rotation Coppice	2008	3.1	2.8	3
4. Clean Combustion	2009	8.9	6.3	4
Total		18.5	14.5	18

"We now have a clear understanding on how each country works and have achieved joint research through the successful joint calls which have been carried out."

Results of an evaluation of the first joint call by ERA-NET Bioenergy, carried out towards the end of 2009, showed some valuable insights into the ERA-NET Bioenergy network as a whole. ERA-NET Bioenergy was proven to be a strong collaboration between very different programmes in the Member States.

Between 2006 and 2010, ERA-NET Bioenergy has succeeded in setting up an impressive total of four Joint Calls on Small-Scale Combustion, Gas Cleaning from Biomass Gasification, Short Rotation Coppice and Clean Combustion, with a total funding of €15 M from the participating countries, see table. The Joint Calls were developed based on analyses of national capabilities and national programmes, as well as on expert workshops.

The Joint Calls are tangible examples of cooperation and implementation among and within participating countries. According to the evaluation carried out, Joint Calls not only offer valuable insights into specific research priorities within the participating countries, but also lead to establishing valuable networks of cooperation. Joint Calls also provide a platform for continued cooperation, which is conducive to quality enhancement of bio-energy research programmes in the Member States.

The exchange of information has also led to an overview of the national programmes, their objectives and criteria for project evaluation and projects. The results are available on the website www.eranetbioenergy.net under "National Programmes".

Milestone Achievements

1

2004-10-01

ERA-NET Bioenergy starts



2

2005-01-01

Website launched
www.eranetbioenergy.net



3

2005-01-12

Consortium Agreement signed



4

2005-01-13

ERA-NET Bioenergy kick-off



5

2005-05-30

Long list of topics ready



6

2006-03-01 | 2006-05-03

Small-scale Combustion Joint Call open



7

2006-11-01 | 2008-08-31

Small-scale Combustion projects run



8

2006-04-01

Denmark and France join ERA-NET Bioenergy



9

2007-06-01 | 2007-09-06

Gasification Joint Call open



10

2008-01-01 | 2010-06-30

Gasification projects run



11

2008-01-02 | 2008-04-01

Short Rotation Coppice Joint Call open



12

2008-09-01 | 2011-08-31

Short Rotation Coppice projects run



13

2008-10-28

ERA-NET Bioenergy Conference



14

2008-12-31

Small-scale Combustion Joint Call evaluation



15

2008-12-01

Ireland and Poland join ERA-NET Bioenergy



16

2009-02-09 | 2009-04-30

Clean Combustion Joint Call open



17

2009-10-01 | 2012-10-31

Clean Combustion projects run



Setting up Joint Calls – Learning by Doing

A call's value to the European research community is certainly its most important feature, which is why we, as ERA-NET Bioenergy partners, are glad to hear positive feedback from researchers. Yet the organisers also profit from the experience. Therefore, it is highly constructive to look back on a successful call. The joint calls are also the most rewarding part of ERA-NET Bioenergy for the funders, as they bear the most tangible results.



So what is ERA-NET Bioenergy's own resumé?

First and foremost, there is the challenge of defining topics. The topics for the first two calls, Small-Scale Combustion (SSC) and Gas Cleaning, were directly developed from a long list the ERA-NET Bioenergy partners had drawn up. Internal meetings followed to fine-tune topics and procedures.

In the case of Short Rotation Coppice (SRC), the third call, a "lignocellulosic" topic had been discussed internally for over a year but proven elusive. Suggestions varied from forests to reed canary grass, and from cultivation to end use – far too broad.

ERA-NET Bioenergy therefore decided to introduce a new component to the call planning scheme and organised an expert workshop dedicated not simply to information exchange, but very specifically targeted towards identifying call topics. This worked so well that it was decided to use the same procedure again for the fourth call on Clean Biomass Combustion.

Four joint calls, one learning curve

The first call served very much to establish procedures for international cooperation in R&D funding. Communication, evaluation and selection meant a day-to-day work in the implementation phase of the call and proved the value of real, hands-on learning. In the first call, challenges were counted on and therefore the call framework was kept simple, with only research organisations funded and project duration limited to two years.



From the second call onwards, industry participation was strongly desired. The Partners also tested some new features of project evaluation, such as a veto mechanism for each funding agency.

In the third call, it was made possible for researchers from other countries than the ERA-NET Bioenergy Member States to participate in proposals and for non-ERA-NET Bioenergy partners to join as funders.

In the fourth call, it was time to demand a greater cooperation effort from a small but growing European bioenergy R&D community and increase the minimum number of countries in one consortium from two to three. Industry participation was also mandatory this time, and auspiciously researchers from countries not involved in the network joined the applicant consortia.

This fourth call, on the topic of Clean Biomass Combustion, was also a logical follow-up of the first ERA-NET Bioenergy call on Small-Scale Combustion. The research projects funded under this first call had finished in 2008, and researcher feedback at the end of the call had provided valuable input for a "sequel". This, in contrast to the Small-Scale Combustion call, was very much industry-focussed, and results are expected to be implemented in the short-term.

To summarise, the way of working within ERA-NET Bioenergy has proven to be efficient regarding both the administrative work and the research results. Researchers appreciated that contacts between them and funding agencies were kept nationally and that the national grant procedures were maintained, while still enabling international cooperation. The Joint Calls have also resulted in a more effective dissemination and networking between countries.



1. SMALL SCALE COMBUSTION 2006

Project #	Title of project	Country	University/ Institute/ Company - Organiser	Budget per project	Grant per project
JWP1-5	Development of Test Methods for Non Wood Small-Scale Combustion Plants	AT	Austrian Bioenergy Centre GmbH	347.099 €	259.692 €
		AT	Francisco Josephinum Biomass Logistics Technology		
		SE	SP Swedish National Testing and Research Institute		
		FI	Technical Research Centre of Finland (VTT)		
		DE	Institut für Energetik und Umwelt, Leipzig		
		DE	Technologie- und Förderzentrum Straubing		
JWP1-9	Clean Biomass Combustion in Residential Heating: Particulate Measurements, Sampling and Physicochemical and Toxicological Characterization	AT	Graz University of Technology	601.367 €	461.938 €
		SE	UmU (Including both faculties of Science & Technology and Medicine)		
		SE	Energy Technology Centre, Piteå		
		FI	National Public Health Institute		
		FI	University of Kuopio		
		FI	Finnish Meterological Institute Helsinki		
		DE	Technologie- und Förderzentrum Straubing		
		DE	Institute of Toxicology and Experimental Medicine Hannover		
JWP1-11	Evaluation of technology for small scale combustion of pellets from new ash rich biomasses regarding combustion technology and emission reduction in special case particulate matter and Nox	SE	SLU (Swedish University of Agricultural Sciences)	494.588 €	397.275 €
		SE	SP Swedish National Testing and Research Institute		
		FI	Technical Research Centre of Finland (VTT)		
		DE	ATZ Entwicklungszentrum		
		DE	University of Applied Sciences Amberg-Weiden		
		DE	Herding Filtertechnik GmbH		
		DE	A.P. Bioenergietechnik GmbH		
		DE	Friz Grimm GmbH & Co		
JWP1-12	Small Scale Biomass-Fired CHP Systems	DE	University of Essen	355.153 €	291.165 €
		UK	University of Nottingham		
		UK	Renewable Energy Suppliers Ltd		
		UK	Nottingham County Council		
		UK	Barnsley Metropolitan Borough council		
		DE	Gesellschaft für Motoren und Kraftanlagen GmbH GMK		
JWP1-15	Control Potential of Different Operating Methods in Small-Scale Wood Pellet Combustion	SE	Växjö University	295.870 €	257.300 €
		SE	MBIO Energiteknik AB		
		FI	University of Oulu		
		FI	Tampere University of Technology		
		FI	HT Enerco OY		
20	Total funded in Joint Call • SMALL SCALE COMBUSTION			2.094.077 €	1.667.370 €

2. GASIFICATION GAS CLEANING 2007

Project #	Title of project	Country	University/ Institute/ Company - Organiser	Budget per project	Grant per project
JWP2-1	Tar removal from low-temperature gasifiers	NL	Energy Research Centre Netherlands (ECN)	744.000 €	660.000 €
		NL	Dahlman		
		DK	Dall Energy		
		DK	Danish Technical University		
		DK	Danish Fluid Bed Technology		
		DK	Anhydro		
JWP2-3	Energy efficient selective reforming of hydro carbons	SE	Chalmers University of Technology, Gothenburg	738.158 €	441.095 €
		SE	Scandinavian Energy Project AB		
		SE	Göteborg Energi		
		DK	Danish Technical University		
JWP2-6	Development of a photoionization-detection technique for on-line measurement of biomass tar concentrations	NL	Biomass Technology Group BTG	494.699 €	466.762 €
		SE	Royal Institute of Technology (KTH), Stockholm		
JWP2-7	Cleaning and treatment of Product Gas from biomassgasifiersoptimisation of the H2:CO - ratio in synthesis gases for the production of 2nd generation biofuels	DE	Clausthaler Umwelttechnik-Institut GmbH (CUTEC)	830.392 €	515.804 €
		DE	H.P.C. Starck		
		AT	Vienna University of Technology		
		AT	Repotec		
		AT	Biomassekraftwerk Güssing		
JWP2-9	Mop Fan and Electrofilter: an innovative approach to cleaning product gases from biomass gasification	DE	Technische Universität, Berlin	856.133 €	677.203 €
		DE	AEROB-BETH Filtration GmbH		
		UK	University of Nottingham		
JWP2-10	Intensification of Syngas Cleaning and Hydrogen Separation	DE	Institut für Mikrotechnik Mainz GmbH	940.116 €	571.870 €
		UK	Newcastle University		
		UK	ITI Energy Ltd., Innovation Technology Centre		
Total funded in Joint Call • GASIFICATION GAS CLEANING				4.603.498 €	3.332.734 €

3. SHORT ROTATION COPPICE 2008

Project #	Title of project	Country	University/ Institute/ Company - Organiser	Budget per project	Grant per project
JWP3-3	Targeted breeding of a European SRC willow crop for diverse environments and future climates	UK	Rothamstead Research	1.046.478 €	769.496 €
		SE	SLU (Swedish University of Agricultural Sciences)		
		SE	Uppsala University		
		SE	Lantmännen/Agroenergi AB		
JWP3-4	Reducing environmental impacts of SRC through evidence-based integrated decision support tools	SE	SLU (Swedish University of Agricultural Sciences)	850.120 €	850.120 €
		SE	Chalmers University of Technology		
		DE	Johann Heinrich von Thünen-Institut (vTI), Institute of Forest Ecology and Forest Inventory		
		DE	University of Rostock		
		DE	Beckmann Institute for bio-production technology lines e.V. (BIOP)		
JWP3-7	Cost reduction and efficiency improvement of Short Rotation Coppice on small field sizes and under unfavourable site conditions by focussing on high product quality and a product-oriented co-operative value chain	FR	Institut National de la Recherche Agronomique (INRA)	774.052 €	580.294 €
		DE	Forstliche Versuchs- und Forschungsanstalt Baden-Württemberg (FVA)		
		DE	University of Applied Forest Sciences Rottenburg		
		DE	Institut für Energiewirtschaft und Rationelle Energieanwendung - Universität Stuttgart (IER)		
		DE	Unique forestry consultants GmbH		
		DE	Schellinger KG		
		DE	GESA GmbH		
		DE	Stora Enso Forest Central Europe GmbH -Abteilung Bioenergie		
		FR	UPM - Kymmene France / Ets Stracel		
Total funded in Joint Call • SHORT ROTATION COPPICE				2.670.650 €	2.199.910 €

4. CLEAN COMBUSTION 2009

Project #	Title of project	Country	University/ Institute/ Company - Organiser	Budget per project	Grant per project
JWP8-03	Advanced Biomass Combustion Modelling for Clean Energy Production	FI	Foster Wheeler Energia Oy	1.799.230 €	1.249.747 €
		FI	Lappeenranta University of Technology		
		FI	VTT Technical Research Centre of Finland		
		PL	Czestochowa University of Technology		
		PL	PGE Turow Power Plant.		
		SE	Chalmers University of Technology (CTH)		
JWP8-10	Future low emission biomass combustion systems	AT	Bioenergie 2020+ GmbH	1.934.496 €	1.459.968 €
		DE	Technology and Support Centre of Renewable Raw Materials (TFZ)		
		DK	Exhausto CDT A/S		
		FI	University of Kuopio		
		FI	Warma-Uunit Ltd		
		IR	Teagasc		
		NO	Applied Plasma Physics AS		
		PL	Institute of Power Engineering (IEn)		
		SE	Lulea University of Technology (LTU)		
		SE	SP Technical Research Institute of Sweden (SP)		
		SE	Umea University		
JWP8-11	Scientific tools for fuel characterization for clean and efficient biomass combustion	AT	Bioenergie 2020+ GmbH	3.229.682 €	1.507.378 €
		DK	Technical University of Denmark (DTU)		
		FI	Åbo Academy University (AAU)		
		NO	Norwegian University of Science and Technology (NTNU)		
		SE	Chalmers University of Technology (CTH)		
Total funded in Joint Call • CLEAN COMBUSTION				9.578.408 €	5.908.049 €
Total volume of all ERA-NET Bioenergy joint calls				18.946.633 €	13.108.063 €

Interviews with Project Coordinators in the Joint Calls

Between 2005 and 2010, four Joint Calls were planned and implemented in the framework of ERA-NET Bioenergy. Each of these resulted in a number of transnational R&D projects being selected for funding. The topics for these calls were:

- 1 **SMALL-SCALE BIOMASS COMBUSTION (SSC)**
- 2 **CLEANING AND TREATMENT OF PRODUCT GAS FROM BIOMASS GASIFICATION (CBG)**
- 3 **SHORT ROTATION COPPICE (SRC)**
- 4 **CLEAN BIOMASS COMBUSTION (CBC)**

Pearse Buckley from SEAI says:

"Our participation in the joint call on Clean Biomass Combustion has resulted in one of our research institutions being engaged in a 3 year project with leading research partners from 5 other European countries. While the project has only recently begun, the Irish institution involved is already reporting positive impact in terms of their research activity and how it might be further developed. In addition, the themes for other proposed joint calls that are being considered by ERA-NET Bioenergy have strong resonance with our national priorities and we see great scope to further exploit this mechanism for mutual benefit".

On the following pages, Project Coordinators will tell you more about their experiences with the ERA-NET Bioenergy calls.

Interview with Christoffer Boman

ERA-NET Bioenergy fills the gap

The overall purpose of the BIOMASS-PM project was to strengthen the interdisciplinary scientific evidence of the advantages of new combustion technologies and emission after-treatment in small-scale biomass heating systems. The project related well to the overall goal of the call, i.e. to enable an increased introduction of environmentally (including health) friendly small-scale biomass technology in the European market. Within the project, a multi-disciplinary consortium of ten internationally well-established research teams from four countries was formed that constituted the basis for further joint application within ERA-NET Bioenergy.

The primary motive for applying for this call was, according to Christoffer Boman, Project Coordinator from Sweden, to establish himself (as a young researcher) and Umeå University as an academic partner in a European research network of relevance, and facilitate future fruitful collaboration that supports the development of new biomass combustion technology. Since the topic of the call corresponded to a large extent with Boman's research during his PhD studies, he felt very encouraged by the possibility to continue and expand this area of research as a senior researcher on the European level.

According to Boman the added value lies in the organisation of ERA-NET Bioenergy:

"It is very suitable in terms of the number of partners and persons involved, which enables a close interaction and networking on a personal level."

For Boman personally, the project had a significant positive impact on his career as a researcher, and the network that was established today acts as a very fruitful collaboration platform for him and his new PhD students.



Christoffer Boman,

Dep. of Applied Physics and Electronics,
Umeå University, Sweden

Project Coordinator in the Joint Call:
Small-Scale Combustion

Boman explained that the interaction and close discussion and exchange of experiences between the multi-disciplinary research forum are most valuable and definitely increase the quality of their research. *"As a part of an ERA-NET consortium, you have direct access to the latest experiences and scientific findings within the field and can directly implement this in your own research. The possibility for young PhD students to take part in the work at other international institutions in an easy way is also most valuable"*. Furthermore ERA-NET Bioenergy very clearly fills a gap in the shadow of the larger EU framework projects; a gap that enables more interdisciplinary and "problem-solution" oriented collaborations that includes both more "fundamental" and "applied" research often in close collaboration with the industry."

In addition Boman was very positive about the application procedure and explained that it has several benefits since it works on the national level. Therefore, the project partners are familiar with the procedure and often have personal contacts at the national funding agencies.

Last but not least, in response to the question if given the opportunity to participate in a call in the future - Boman was most enthusiastic - *"Yes definitely - in fact, we already have since we participate in two projects within the Clean biomass combustion call!"*

Interview with Galip Akay

Small is beautiful – a shining example of science and engineering coming together.



The main purpose of the Joint Call on Gasification cleaning and treatment of product gas from biomass gasifiers was to generate joint European research and to develop activities, relevant to industry. Companies and research organisations were invited to submit proposals, on the condition that one of the Partners taking part in the project was from industry. Six consortia involving organisations from Germany, the Netherlands, Sweden, Austria, the United Kingdom and Denmark succeeded in having projects selected for funding.

The objective of the "SynClean" project "Intensification of Syngas Cleaning and Hydrogen Separation" was to produce tar-free syngas from gasification and to separate hydrogen to use as a means of controlling the syngas composition. These processes are necessary in order to be able to convert syngas into alcohol or other chemicals – conversion into liquid fuels. This project contributed to the goals of the call by establishing a technology whereby biomass can be used to create fuel and power.

The main motivation for applying for this call was to develop a gasification technology for commercialisation. *"Small-scale is the key here"*, explained Galip Akay, Project Coordinator from Newcastle University, UK, *"as compared to large-scale power generation. One way would be to use syngas to convert into electricity. The currently available methods are not efficient and tar removal is a major problem. Conversion efficiency can be doubled if syngas is used in fuel cells. In addition we are developing a technology to convert syngas into biofuels. This needs to be done on a small-scale – max power output (electricity) approximately 10 megawatt serving communities within a 50 km radius"*.



Galip Akay

University of Newcastle, UK
Project Coordinator in the Joint Call:
Gasification Cleaning and Treatment of
Product Gas from Biomass Gasifiers

Akay explained that *"the main added value of participating in the project was the funding received to enable us to carry out the research (approx € 1 million) in different aspects of this distributed biomass-to-fuel/power conversion. It has been very useful to combine facilities as well as learn from one another"*.

"My experience in participating in the Call", explained Akay, "has been a positive one. The call has been well managed. Regarding time schedules, although we have had to meet certain deadlines, in general it has been relaxed. The know-how – to know who is doing what – the additional source of information has been extremely valuable. I now know even more researchers in the field".

As far as Akay's experience goes in participating in the project regarding collaboration with the Partners, this has also been positive. *"We have had several well organised meetings and the quality of the research has been very high. In my view the project is an essential part of the jigsaw and is very focussed on commercialisation. Above all the project has helped us to fund the necessary research – we are making the right steps. The real effect will be seen in the next 3 years in tangible outcomes in terms of commercial applications. This is a big opportunity for establishing a new technology, a new industrial revolution in energy and chemicals. Biology, electronics and information technologies had their revolution in the last few decades, but energy and chemicals did not, it is about time!"*.

Accessibility to communication facilities should also be considered. For example to cut down on the number of meetings to improve our carbon footprints we should use video and telephone conferences where possible. The lesson which stands

out the most in my view is how important it is to get to know the people with whom you are working".

The main advantages of having a call organised by ERA-NET Bioenergy compared with other means to achieve international cooperation lies in the efficient use of joint facilities explained Akay. *"In addition different people bring in different perspectives. We have benefited from the expertise of our project Partners and vice versa"*.

This project has been a shining example of science and engineering coming together. It is important to note that most progress is made by carrying out interdisciplinary research.

In response the questions if given the opportunity to participate in a project in a new call in the future, Akay replied *"Yes I would definitely participate!"*.

Coppice across borders A very global view of energy wood value chains



Nicolas Marron

INRA, France,

Project Coordinator in the ERA-NET Bioenergy
Short Rotation Coppice Call

CREFF (Cost reduction and efficiency improvement of Short Rotation Coppice) is a French-German project (2008-2011) co-funded by ADEME and FNR under the call topic; "Improving the value chain of SRC". Five scientific partners (INRA, FVA, HFR, IER, and UNIQUE) work in close collaboration with a number of industrial, producer and farmer partners along the complete Short Rotation Coppice (SRC) value chain in both countries.

Nicolas Marron, project coordinator from INRA, France, explains: *"My main motivation was to collaborate with teams working on this subject across borders. The situation is very similar in France and in Germany in terms of lack of knowledge and of delays in the development of optimised itineraries."*

The added value is clearly provided by the network of early and intensive collaboration established under the framework of the project. Research institutes, technical forest institutes, forestry consultants, universities, associations, cooperatives, Agricultural Chambers, Industrials, farmers, etc. both in France and Germany are involved in the project. All these partners involved at different steps in the value chain are working together, providing an invaluable strength to the project. The project has a very global view of the entire SRC value chain."

The overall project objective is to define economically optimised SRC in a context where marginal areas are more likely to be used for this purpose in order to avoid competition with food agriculture. Therefore, a detailed economic analysis of the current situation at each step of the value chain will be performed in France and in Germany concerning plantation management, harvest and transport, and conditioning of wood quality. *"The Consortium is totally complementary. Almost all aspects of SRC are considered in the project (production, harvest, wood quality,*



Excursion CREFF KickOff 2009

economics, socio-cultural issues, etc.) and each of the five research partners is a specialist in at least one of these topics. The industrial and producer partners also represent the upstream and downstream parts of the value chain, so we can really answer the questions asked by the two extremities of the chain: supply and demand."

Marron explains that, due to a long-time focus on nuclear development, the topic of biomass (including SRC) has only recently returned to the agenda of French R&D institutions, and "the ERA-NET Bioenergy call was a way to boost this topic by offering to the scientists the means financial and collaborative means to work on this subject."

With regard to communication with ERA-NET Bioenergy representatives, Marron maintains that both the German and the French funding agency were very reachable by e-mail or phone, and that representatives attended CREFF steering committee meetings as much as possible. CREFF also helps communication by giving both funding agencies access to the confidential database with reports and other documentation.

Asked about possible difficulties, Marron recalls starting difficulties *"regarding the harmonisation of reporting schedules between the agencies, as both have specific rules and deadlines"*, and wonders whether the agencies could improve on the aspect of common rules and deadlines for whole projects as well as individual work packages.

As a note of advice for future proposers, Marron also points out that *"Language diversity can cause additional workload. Itineraries, reports, presentations, etc. that we want to show to the farmers have to be translated into French and German (as the farmers are notably involved in the project, but often speak no English) and often into English as well for diffusion among*

project partners. It is a non-negligible source of additional work. Communication within CREFF, however, is fortunately co-ordinated by Laura Van den Kerchove, who is fluent in French, German, and English".

Illustrating the extensive work CREFF has put into ensuring collaboration within the consortium runs smoothly, Marron mentions that steering committee meetings are organised every 4 months. These meetings are attended by the 5 research partners only, and supplemented by an annual project seminar with all partners. In addition to these physical meetings, each partner is required to write bi-monthly mini-reports on his activities. Further information is distributed via the Silverpeas area (restricted access) and the website www.creff.eu (public information).

Marron emphasises that, although he has been and still is involved in other international projects, the ERA-NET Bioenergy calls provide for *"more complete projects"* than e.g. the Egide programmes which only reimburse travel costs.

From a researcher point of view, he explains, it seems a pity that *"compared with European calls, a limited number of countries in Europe are involved and you can't collaborate with any country in Europe. But I guess that the countries involved have similar preoccupations for a given call, and it may be the way to target potential collaborative countries"*.

Finally, Marron stresses that he would definitely participate in an ERA-NET Bioenergy call again given a suitable topic: *"Being an ecophysiologist, the project gave me the opportunity to collaborate with partners involved at different steps of the SRC chain and specialists in other aspects of SRC. I'm not sure I would have had this opportunity without the ERA-NET Bioenergy call."*

Heating up – improving bioenergy deployment through cleaner biomass combustion

The Joint Call on Clean Biomass Combustion was a successor of the first Joint Call of ERA-NET Bioenergy with the aim to significantly lower emissions from solid biomass combustion. The Future BioTec (Future low emission biomass combustion systems) project provides a substantial contribution concerning the development of future low emission stoves and automated small- and medium-scale biomass combustion systems (< 20 MWth). This technology development will be accompanied by techno-economic evaluations in order to prove that the new technologies are also economically competitive. In order to achieve these aims, a consortium of eight internationally recognised R&D Partners as well as three industrial partners from eight European countries has been formed.



The main motivation for applying for this call, explains Ingwald Obernberger of Bioenergy 2020+ GmbH, Austria, is the possibility to scientifically co-operate on an international basis. Within the EU 7th Framework Programme, hardly any R&D topics in the field of biomass combustion have been announced over the last two years. This has made it very difficult, Obernberger explains, to cooperate on an international basis, something that his group has been used to for more than 15 years. Obernberger considers the topic of the Clean Biomass Combustion call to be among the most relevant R&D topics in renewable energy, as biomass combustion is the conversion technology which has already been introduced into the market successfully. Nevertheless, further development and improvement are required in terms of emission reduction, as well as in terms of utilising new types of biomass fuels.

According to Obernberger there is much added value in participating in this joint call. The strong and intensive cooperation and information exchange with well-known R&D institutions from other EU countries active in the same field means that all partners gain knowledge and new data. The fact that every partner brings in their special expertise in the project as well as relevant background information based on already performed national projects will accelerate further development and strengthen the scientific basis of the consortium. The Joint Call opens up a possibility to establish common guidelines and harmonised measurement methods which will be applicable in and relevant for all participating countries.

When asked about his experience in participating in the Call, Obernberger explained that the communication with ERA-NET Bioenergy representatives works well, on a national as well as on an international level.



Ingwald Obernberger

Bioenergy 2020+ GmbH, Austria
Project Coordinator in the
Joint Call on Clean Combustion

Obernberger explained that the collaboration with the project partners also works well – most of them are already experienced in international cooperation. The quality of the research is high due to the specific expertise of many partners. Moreover, countries not so well experienced in small-scale biomass combustion will considerably improve their level of knowledge in this field.

When asked whether he would be working in an international project if it had not been for ERA-NET Bioenergy Obernberger replied, *"Of course my research group has been and is also engaged in other international EU projects; international cooperation is an absolute "must" for research institutions who want to work on a high level basis"*.

The lessons learnt for Obernberger are that the cooperation between the partners runs smoothly. The approach of the Clean Biomass Combustion Call, namely to contact national experts and together define the Call Programme, also works very well and ensures that national objectives and needs are considered. *"ERA-NET Bioenergy has become a relevant initiative within the scientific bioenergy community now."*

When asked whether he would participate in a project in a new call if given the opportunity in the future, Obernberger was clearly positive – *"Yes ,definitely. I strongly hope that the ERA-NET initiative will continue and will be established as a regular instrument within the EU joint R&D activities"*.



Cultivating European Partnerships



ERA-NET Bioenergy initially started with nine partners from six Member States. Since this was a first-time effort for both the European Commission and the Partners, a manageable set-up of a limited number of countries was opted for. The step-by-step approach which has continuously been followed throughout the duration of ERA-NET Bioenergy has been flexible and pragmatic, and aimed at concrete practical results. Experience gained from the joint activities of the programmes has led to an even wider range of programmes, and also to an expansion of the network, gradually allowing new Member States to participate.

Expansion of the Network

In December 2006 Ademe, France, and Energinet, Denmark, joined ERA-NET Bioenergy. Ademe very quickly took an active role in setting up a new joint call on Clean Combustion.

In 2008 SEAI, Ireland, and NcBiR, Poland, came on board, bringing the total number of ERA-NET Bioenergy partners to 15 and the total number of Member States to 10.

The support from the European Commission has been a key driving force in bringing Partners together in the ERA-NET Bioenergy collaboration. The coordination budget and contract have harmonised the relationship and commitment. At the end of 2008 ERA-NET Bioenergy was granted an extension up until the end of May 2010. Besides finalising some activities already started during 2008, a fourth Joint Call was planned and implemented. Moreover, new cooperation was sought on synthetic natural gas and liquid biofuels, new Partners from Ireland and Poland joined, and the Strategic Energy Technology (SET) Plan was followed closely looking at how to embed ERA-NET Bioenergy into this plan. In addition joint programming was investigated during 2009 with the Technology Platform Biofuels

and a workshop took place in Dublin in March 2009 entitled: Joint Meeting ERA-NET Bioenergy and the Biofuels Technology Platform on biofuels and biomass pre-treatment – developing joint programming.

However, in order to develop a mature and sustainable partnership, and to broaden the network to include more Member States, further funding for a follow-up coordination activity is essential. ERA-NET Bioenergy would especially like to integrate more Member States from Eastern and Southern Europe into the network, which would significantly increase the demand for co-ordination resources.

European Knowledge-based Bio-Economy (KBBE) and the Strategic Energy Technology (SET) Plan.

The Directorate Research and Innovation from the EC is split into several directorates, of which Energy and Knowledge-based Bio-Economy (KBBE) are crucial for ERA-NET Bioenergy in the 7th European Framework Programme for Research and Technological Development.

ERA-NET Bioenergy participates in networking and will join forces with a number of other bio-based ERA-Nets to bring together science, industry and other stakeholders to utilise new and emerging research opportunities that address social, environmental and economic challenges. High-level representatives of EU Member States, candidate countries and countries associated with FP7 promote the development and implementation of a European research policy for the Knowledge-based bio-Economy in coordination with the Standing Committee on Agricultural Research (SCAR), which supports the EC in this drive towards improved coordination of agricultural research across the European Research Area. ERA-Nets are a strategic element, allowing for growth and evolution of the KBBE.

ERA-NET Bioenergy is one of the players in the KBBE. A follow-up coordination action would build upon the results so far and contribute to a sustainable KBBE. For instance, ERA-NET Bioenergy is currently exploring the possibilities for a joint call with another ERA-Net in the KBBE area. Other joint actions under consideration cover a broad range of bioenergy-related topics from biofuels to Synthetic Natural Gas. On the latter issue, ERA-NET Bioenergy has just started to collate information about ongoing national programmes and projects. Further information will be available in due course.

In addition ERA-NET Bioenergy will continue its cooperation with the European Biofuels Technology Platform. Further to the joint workshop, which helped to identify biofuel-related R&D needs which ERA-NET Bioenergy might address, ERA-Net Partners also provided input to the EBTP's updated Strategic Research Agenda. In the future, collaboration will also be extended to the European Industrial Bioenergy Initiative (EIBI). The European Industrial Initiatives are one of the core instruments of the SET-Plan. Industry-led, they aim to accelerate the commercial deployment of advanced technologies. EIBI will increase the contribution of sustainable bioenergy to the EU 2020 targets by identifying the most relevant, innovative bioenergy value chains and by facilitating, through public-private-partnerships, international demonstration and reference plants within these value chains.

ERA-NET Bioenergy plans to support this work by identifying the need for accompanying R&D and coordinating Member State input.

"Joining ERA-NET Bioenergy represents an opportunity to mutualise our research efforts and to create a real understanding of other national research management systems and pave the way for synergies".

Maurice Dohy, Ademe, France.

"Joining ERA-NET Bioenergy is the most efficient way to stay informed on the European biomass research agenda, especially within the fields of power and heat production from biomass, gasification and production of liquid biofuels".

Lise Nielson, Energinet Denmark.

"Becoming part of ERA-NET Bioenergy has been a very important development for the Sustainable Energy Authority of Ireland (SEAI) and our prior expectations have been more than met. Since joining ERA-NET Bioenergy in December 2008, SEAI has participated in a number of activities of direct relevance to the development of bioenergy in Ireland. Through working with the network participants we have gained insight into the approaches of their national funding agencies and how these might be applied in our own context, and have a better understanding of how our national programmes can be developed synergistically with other European countries.

In our view, ERA-NET Bioenergy is a very effective way for cooperative research and possible joint programming and SEAI is committed to continued participation.

Pearse Buckley, SEAI, Ireland.

"By participating in ERA-NET Bioenergy the enhancement of cooperation between research units and coordination of joint activities on the Community level will become possible, and will lead in the direction of comprehensive implementation of the EU's renewable energy strategy".

Anna Ostapczuk, NCBiR, Poland.

Persistent challenges require continued collaboration



Bert Stuij,
NL Agency, The Netherlands

During the past four years I have had the honour of chairing the Management Board meetings of ERA-NET Bioenergy. I found all of these meetings uplifting and inspiring. Each time it was possible to report new results, new members were added, and new ideas were discussed. The results of just over five years of close and enthusiastic cooperation are beautifully illustrated in this booklet.

However, although it may be time to celebrate, it is no time to rest. For the Board, meetings also served as a continuous and sobering reminder of the remaining challenges ahead. Support for bioenergy across the EU is far from harmonised. It was often difficult to combine national instruments to the 'Joint Calls' we deemed necessary. Perceptions of issues such as sustainability, the best use of biomass, or the relationship with agricultural policies varied, and what is more continue to vary. Cross border

specialisation of research institutes in Europe is still some way off. Research on biomass and biomass conversion technologies is still sometimes 'doubled' in institutes across Europe, rather than combined.

I am convinced that such issues can only be addressed by close collaboration, driven by the strong will to address a world-wide issue from a European – rather than a national – perspective. Such commitment was evidently present in ERA-NET Bioenergy. Now is the time to capitalise on this commitment, and to find a way forward for a strong network, ready to work on an important cause.

Bert Stuij
Chair Management Board,
ERA-NET Bioenergy.

ERA-NET Bioenergy

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E-mail: info@eranetbioenergy.net

Editorial Board

Rebecca van Leeuwen-Jones (NL Agency, the Netherlands),
Åsa Karlsson and Margareta Zeicu (Swedish Energy Agency,
Sweden), Karen Görner (FNR, Germany)

www.eranetbioenergy.net

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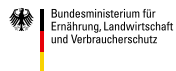
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