



# INDUSTRY GUIDE

## THERMOCHEMICAL BIOMASS GASIFICATION

# 2018

Sustainable electricity and heat from wood –  
the cornerstone of your decentralized energy concept

PRODUCERS

SUPPLIERS

SERVICE  
PROVIDERS



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**Dear reader,**

**Imagine sustainably covering your heating needs while simultaneously producing “green” energy. All of this can be accomplished with combined heat and power (CHP) using thermochemical biomass gasification.**

This brochure aims to showcase application possibilities and provides you with a current overview of producers, suppliers and service providers in the sector.

The method of (primarily) lignocellulosic biomass gasification has existed since the end of the 18th century. Vehicles with wood carburetors may still even be familiar to some members of the older generation. Since the start of the 21st century, inventors and developers in innovative companies have dedicated a great deal of attention to this technology and substantial developments continue.

Today sophisticated CHP plants operating with e.g. wood chips or wood pellets are readily available to users. Efficient and climate-neutral, they have been proven to cover the energy needs of agricultural farmsteads, small- and medium-sized enterprises and localized heating networks. The result: added-value is maintained locally and the financial burden is kept low. With this brochure I would like to offer you an overview of the operating principle, the installations available today as well as important players in this sector.

I wish you happy reading and much success with the implementation of your energy concept.

A handwritten signature in blue ink, appearing to read 'Artur Auernhammer'.

**Sincerely, Artur Auernhammer, MdB**  
**Chairman of the Board of the Federal Biomass Association (BBE)**  
**in Germany**

## NETWORKING, PROMOTING, IMPLEMENTING – THE FEE



The innovation network Fördergesellschaft Erneuerbare Energien e.V. (FEE, Society for the Promotion of Renewable Energy) has been promoting exchange between industry and science in the field of renewable energy since its foundation in 1993. To realize its vision the FEE works to connect innovative players, organizes workshops and conferences, arranges transfers in know-how and develops projects.

The organization's 120+ members also profit from the FEE's close relationships to associations and companies in the sector, not least through the location of society headquarters on the "floor of renewables" in Berlin. The FEE's member network includes 55 companies, 13 research institutes and 9 associations and societies as well as numerous experts. The members of the network are spread extensively over Germany, Austria, Switzerland, Italy and Sweden.

The FEE is a not-for-profit organization and is dedicated to the promotion of science and research.

The FEE network and related promotion of innovative technologies is coordinated via the following task forces: "Gasification of Biomass", "Biogenic Gases and Fuel Cells", the "Bio-Methane Board" (together with the Federal Association of Regenerative Mobility) as well as "Energy Efficiency in Non-residential Buildings and Settlements".

**For further information visit [www.fee-ev.de/mitglied-werden.html](http://www.fee-ev.de/mitglied-werden.html)**

## TASK FORCE „GASIFICATION OF BIOMASS“



The task force (TF) has been dedicated to the development and promotion of the thermochemical conversion of biomass since 1994. Comprised of approximately 50 businesses, research institutes, engineering firms and specialists, the TF is the most enduring, stable and active network in this field within the German-speaking arena.

The TF is very well connected on the European stage through its members, participation at various conferences and summits and the hosting of an international conference as well as fostering contacts from various EU projects. Dieter Bräkow, a long-standing expert in the sector, has led the TF since 1996 on an honorary basis. Torsten Birth of the Fraunhofer IFF will follow in his footsteps and take over leadership of the TF.

The TF pools expertise, particularly in the area of decentralized wood gasification plants for combined heat and power (CHP) and combined cooling, heat and power (CCHP). Moreover, it is affiliated with process developers for thermochemical production of synthesis gas for e.g. biofuels and provision of hydrogen from biomass. The members include developers, manufacturers, scientists, suppliers, planners, service providers and operators, reflecting all steps of the process chain. Linkages between applied science and enterprise are expedited and reflected in regular expert symposia and conferences as well as meetings between manufacturers.

The TF regularly updates its knowledge base on the overall state of the technology using annual surveys on the functional capability of the plants. Using this comprehensive knowledge as a basis, it provides, inter alia, neutral evaluations of the state of the market and consultations on technical and efficiency assessments. The TF is also a point of contact for standardization approaches (VDI standard) and cross-sector quality and sustainability projects. Interests are represented on the national level through close collaboration with the German Bioenergy Association (BBE) and the umbrella organization German Renewable Energy Federation (BEE), reinforcing the critical importance of the sector within political and societal spheres.

To be added to the TF distribution list free of charge, please write to [info@fee-ev.de](mailto:info@fee-ev.de)

## TECHNOLOGY CLASSIFICATION

If you have access to solid and natural biomass and you also require substantial heat (or cold) in the summer, you can use thermochemical biomass gasification plants to reduce your consumption costs for heat and electricity.

This is a basic technology for production of bioenergy. In simple terms, solar energy, which is chemically stored in lignified plants, is converted into heat and electricity. As biomass is a renewable source of energy, installations of this nature are part of the renewable energy sector and help to substitute fossil carbon sources. Thus, this technology saves resources, is climate neutral and adds value to the region.

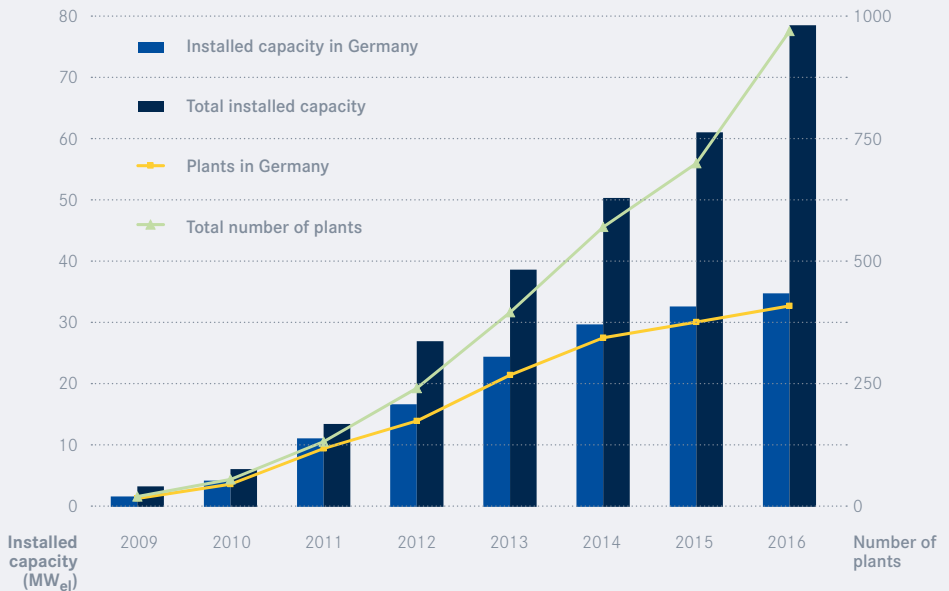
Unlike biogas plants, biomass is broken down at high temperatures. In contrast to combustion, gasification aims to obtain an energy-rich gas mixture as an intermediate product. This gas mixture is used as fuel in engines to ultimately operate generators. Engines in the power range of 10 to 1000 kW transfer energy from gases into rotary motion more effectively than e.g. turbines.

Gas engines in direct coupling with gasification installations represent the shortest technological path and therefore the most effective way to deliver decentralized electricity and heat from dry biomass.



Specifically, it is of particular importance to control tar formation and conversion. This has improved drastically with developing the technology. As an alternative to gas engines, proven hot air or water-vapour systems with turbines are also used in individual plants, especially to provide electricity and heat from special biogenic residues. R&D has produced plants that can convert large quantities of biomass to hydrogen-rich or so-called syngas. Gas of this nature can be better stored as well as used for production of biofuels or specific high value chemicals. >

#### TOTAL PERFORMANCE SINCE 2009

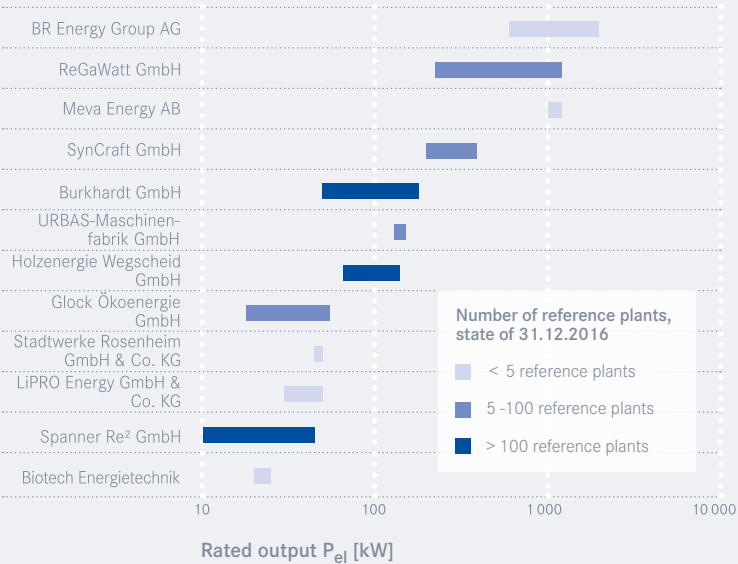


The image above describes the development of thermochemical biomass gasification with CHP, based on FEE data spanning from 2009 to 2016. D/A/CH manufacturers were asked about their German and international installations (10 kW – 5 MW electric power), taking into consideration run times as far as this was possible. The FEE considers the evaluation to constitute a minimum value of functioning plants and capacities.

The period prior to 2009 was marked by technological challenges, resulting in a smaller number of plants. The figure illustrates both an increase in number of plants and in the installed performance of the sector, which until 2011 was mainly focused on the German market and has since grown internationally.

Internal control and external heat recovery is crucial to all of these technological variants, both for process control as well as for the highest possible degree of bioenergy utilization. It is therefore preferable to use thermochemical biomass gasification with CHP use as a heat generation plant with additional extraction of electricity.

### PROVIDERS AND THEIR PERFORMANCE CLASSES



The chart above provides an overview of the European industry producers featured in this brochure. They are depicted in ascending order according to the electrical power of their plants. Bars show the different performance classes offered by each respective producer. Producers with less than 5 reference installations are marked in light blue, producers with 5 – 100 installations are in blue and those with >100 reference systems are in dark blue. In practical applications sites with power output in the MW range have existed for a number of years. However, these results are influenced by the addition of small installations in modular design.

There is no entitlement to completeness. The graphic only gives an overview of the Industry Guide participants and their claimed unique selling points. All rights belong to FEE e.V. Berlin (info@fee-ev.de).

# YOUR CHECKLIST

Based on our experience in thermochemical biomass gasification, potential users should answer the following questions before making an investment decision.

## POINTS TO BE CHECKED IN STEP 1:

- Your long-term heating needs as well as an assessment of past and future technology and costs to cover these needs
- Your long-term electricity needs and whether a certain share of your current electricity consumption can be cost-effectively offset by self-generation, in particular with regard to supply reliability
- Whether you can expand your energy and heat needs, particularly in the summer by including more energy consumers that use heat sensibly by e.g. converting it to cold and if applicable, reduce time-dependencies e.g. through storage.
- Whether you have safe and affordable long-term access to biomass as a fuel

## IN STEP 2 YOU CAN MAKE AN INITIAL CHOICE BASED ON YOUR ENERGY REQUIREMENTS AND AVAILABLE BIOFUEL:

- Compare offers on the market
- Involve an energy consultant and an installation planner to evaluate your needs
- Check the provider's references based on available numbers; visit a reference plant
- Get in contact with the operator of your chosen plant and familiarize yourself with possible special features

# HOW DOES IT WORK?

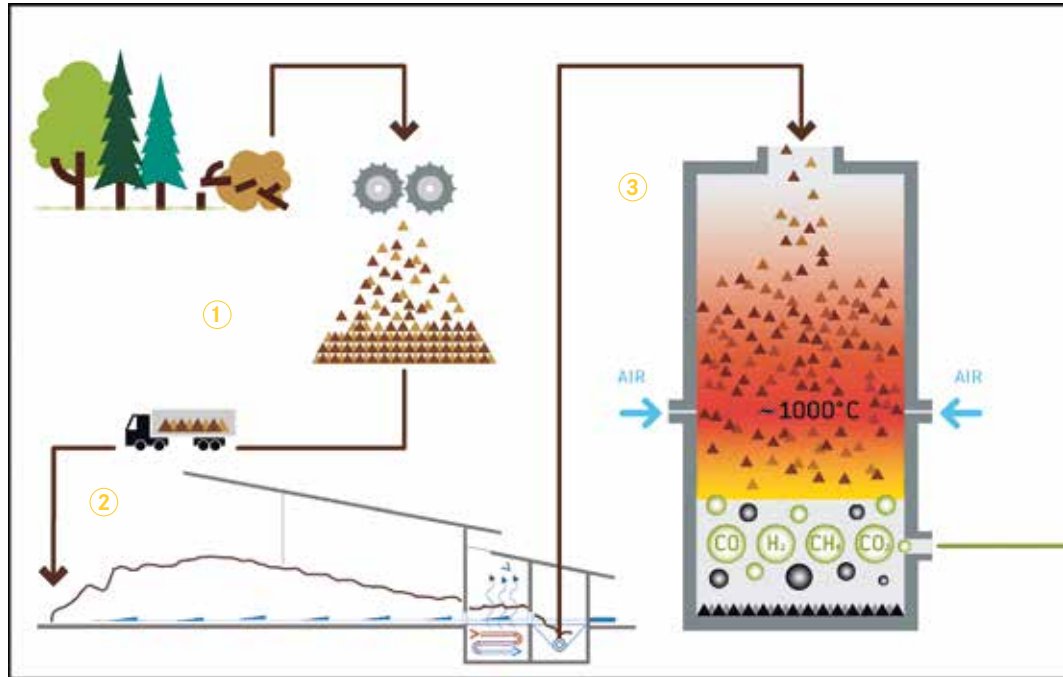
Depending on the required installation output and the given biomass (type, moisture and particle size), thermochemical biomass gasification plants are to consist of suitable individual processes – from upstream fuel processing to downstream gas purification to utilization. These individual components result in mutually coordinated process chains that achieve total energy utilization rates of 70 – 80 %. The following graphic illustrates biomass gasification using the example of the most commonly used method.

## 1 ACQUIRING FUEL

Biomass (mostly residual forest wood) is collected, chopped into small pieces, temporarily stored and transported to the plant.

## 2 STORAGE AND TREATMENT

Here the biomass is stored, dried and sieved. The fuel is subsequently conveyed to the gasification plant automatically.



### 3 THERMOCHEMICAL BIOMASS GASIFICATION

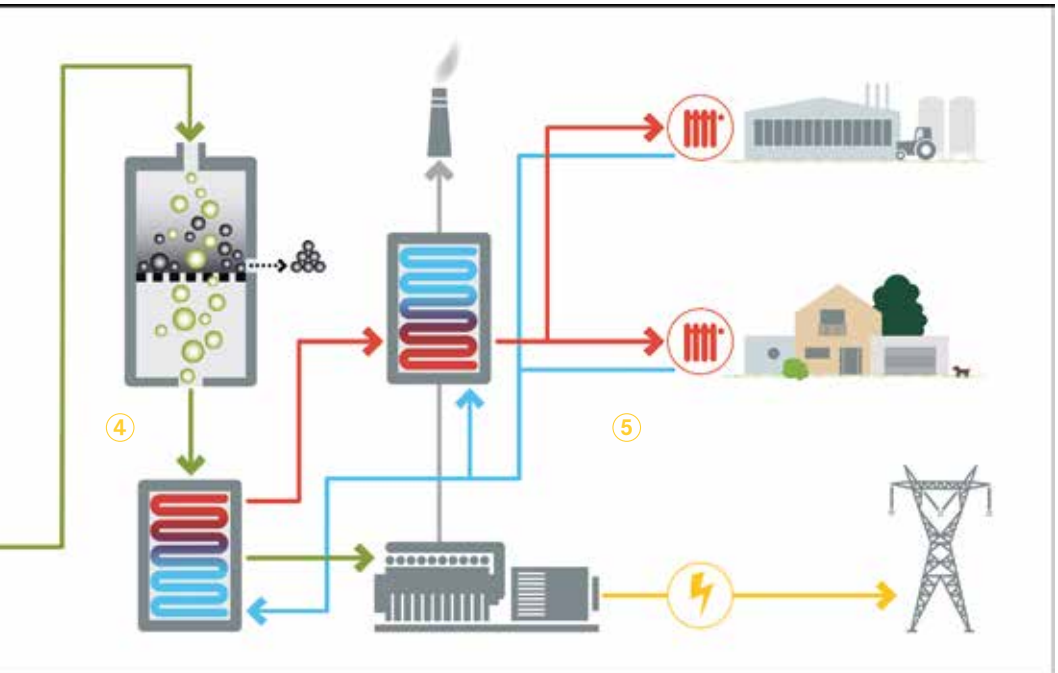
In the gasifier (here: co-current fixed bed gasifier) the fuel is heated, releasing water vapor, volatile components (tar) and gasses when reaching 200 – 500°C. It then turns to coke. The reaction heat results from partial combustion with air through restricted supply of oxygen. Finally, the coke is gasified at temperatures of about 900 – 1000°C. The final outcome is a high-quality crude gas that consists of carbon monoxide, hydrogen and methane, accompanied by carbon dioxide and nitrogen. The dust then gets carried away.

### 4 GAS PREPARATION

The crude gas is cleaned of residues (dust, tar) via filters and gas scrubbers, and then cooled. The released heat is used as useful heat. Residues should be properly disposed.

### 5 POWER AND HEAT PRODUCTION

Motor and generator convert the energy from gas into power that can be consumed or fed into the grid. The concurrent generated heat is partly used for drying the biomass, but mainly transmitted for utilization via distribution grids. Exhaust gas is treated according to local/national emission guidelines.



## PARAMETERS – FEATURES OF BIOMASS GASIFICATION PLANTS

|                                   |   |
|-----------------------------------|---|
| Range of capacity                 | Produced thermal and electric energy (in kW)  |
| Type of raw material              | Unadulterated wood or other biomasses<br>(e.g. according to BiomasseV 2017)   |
| Shape and quality of raw material | Details about shape (wood chips, pellets) and quality<br>(moisture content, lumpiness, fine content and longest wood chip)                                      |
| Gasification process and reaction | Information about the specific process of thermochemical energy conversion (reaction bed and direction of flow)   |
| Number of grid feeding plants     | Number of installed plants that feed into the grid,<br>(closing date: 31 December 2016)   |
| Max. operating time               | per year  |
| Fuel requirement                  | Fuel requirement at nominal load  |
| Flow / return temperature         | Preferred temperature for heat extraction   |
| Required installation room        | Minimum space (L x W x H) for the gasification plant<br>excluding the recommended supply unit, with current output, without heat transferal station and storage |
| Startup and shutdown times        | Time from „0“ to full load and from full load to fail-safe status „off“   |
| Number of employees               | in the field of biomass gasification  |
| Market entry                      | Year of the first product/plant sold in the field of biomass gasification   |
| Distribution countries            | two-letter country codes defined in ISO 3166-1  |

## ABBREVIATIONS

|              |                            |
|--------------|----------------------------|
| CHP          | Combined Heat and Power    |
| CNC          | Computer Numerical Control |
| LPG          | Liquefied Petroleum Gas    |
| moist. cont. | moisture content           |
| NG           | Natural Gas                |
| ORC          | Organic Rankine Cycle      |
| USP          | Unique Selling Point       |

# GENERALISTS WITH A FOCUS ON ESSENTIALS



PRODUCERS



A Salzburg based manufacturer of high quality pellet and woodchip heating systems, we offer complete solutions for private and commercial applications with power output ranges from 2 kW up to 200 kW. In addition to our standard systems, our product portfolio includes tailor-made energy producing technology which also includes accumulators, solar technology and container solutions. As a leading company and holder of ISO 9001:2008 certificates, we are focused on continuous research and development driven by the need to ensure reliability and sustainability.

## CONTACT

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## FEATURES

- 55 kW<sub>th</sub> | 25 kW<sub>el</sub>
- Unadulterated wood in form of wood chips
- Quality of charge material: 20% moisture content, lumpiness: 3,15 < P < 31,5, 10% fine content, max. 150 mm chip
- Moving-bed process in concurrent flow
- Fuel requirement: 25 kg/h
- Gas utilization via motor
- 60°C | 85°C flow/return temperature
- Required installation space:  
5,9 x 2,4 x 2,9 m
- Startup and shutdown times: < 2 min
- Minimal residual material
- 4 grid feeding plants
- Since 2013

# BR ENERGY GROUP AG



BR Energy Group AG, through its subsidiaries BR Engineering GmbH and BR Green GmbH, and through its long-term partner GTS Syngas GmbH, distributes plants for the highly efficient use of woody biomass. The focus here is on the power generation of waste and residual wood.

Thanks to the internal post-combustion, we were able to increase the cold-gas efficiency of our SIRION reactor, which has already been in operation for more than 10 years, to over 80 % and further increase the fuel tolerance. Additionally we deal with synthesis gas production and carbonization.

We would be glad to support you with our expertise also in the planning or optimization of your plant.

## CONTACT

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info@br-eg.com | www.br-eg.com

## FEATURES

- from 200 kW<sub>th</sub> | from 200 kW<sub>el</sub>
- Unadulterated wood, wood chips, other biomasses (among others hogged fuel)
- Quality of charge material: 15 % moisture content, lumpiness: G100, 5 % fine content with less than 10 mm, max. 250 mm chip
- Fixed-bed process (optional: moving-bed) in combination of cocurrent and countercurrent flow
- max. 8000 h/a operating time
- 0,72 kg/kWh<sub>el</sub> fuel requirement at 12 % moisture content
- Gas utilization via motor
- 90 °C | 70 °C flow/return temperature
- Unique selling point: proven for demolition wood / ash free of char
- List of reference plants at FEE
- since 1997



# BURKHARDT GmbH



We started with renewable energies by CHPs fuelled by vegetable oil in 2004. At the same time, we researched ways to convert wood into electricity.

We achieved this in 2010 with the Burkhardt wood gasifier, which is by now being produced modularly and in series. In 2014, we received the Bavarian Energy Award for this.

In the meantime, our wood gas CHP plants exist in various performance classes. Apart from the large machine with up to 180 kW, we also offer a 50 kW plant. All plants are operated exclusively with wood pellets. Our Research and Development department is able to optimize our products permanently. Furthermore, we are also working on research projects in renewable energies.

## CONTACT

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www.burkhardt-gruppe.de

## FEATURES

- 110-260-270 kW<sub>th</sub> | 50-165-180 kW<sub>el</sub>
- Pellets
- Quality of charge material:  
10% moisture content
- Fluidized bed process in concurrent flow
- Max. 8000 h/a operating time
- 40 to 110 kg/h fuel requirement  
(at 10% moist. cont.)
- Gas utilization via motor
- 90°C | 70°C flow/return temperature
- List of reference plants available at producer
- 200 grid feeding plants
- Since 2008
- Distribution countries: DE, AT, CH, IT, SI, GB, LU, JP





GLOCK wood gas combined heat and power plants convert natural wood chips into power and heat from biomass in a highly efficient and sustainable way.

The plants are used in local heat supplies to cover the base load requirement – for example in farming for grain and hay drying or for breeding business for steel heating, in forestry for wood drying as well as for hospitality and hotel businesses. The GLOCK units supply electrical power of 18 kW or 55 kW and a thermal capacity of 44 kW or 120 kW for CO<sub>2</sub>-neutral energy recovery. This advanced and sustainable way of heat recovery provides attractive cost benefits or revenues through the supply into existing electrical grids.

## CONTACT

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+43 2247 90300-600  
office@glock-oeko.at  
www.glock-oeko.at

## FEATURES

- 44 – 120 kW<sub>th</sub> | 18–55 kW<sub>el</sub>
- Unadulterated wood and wood chips
- Quality of charge material: max. 23% moisture content, lumpiness: P16 – P31, 30% fine content, max. 70 mm chip
- Moving-bed process in concurrent flow
- Max. 8000 h/a operating time
- Fuel requirement: 19 kg/h to GGV 1.7 and 60 kg/h to GGV 2.7 at 23% moist. cont.
- Gas utilization via motor
- 90°C | 60°C flow/return temperature
- Required installation space:  
8,5 x 5,5 x 4,5 m for GGV 1.7 und  
8 x 6,5 x 4,5 m for GGV 2.7
- Grid feeding plants: 8 GGV 1.7 and 5 GGV 2.7
- Since 2010
- Distribution countries: AT, DE, CH



# HOLZENERGIE WEGSCHEID GmbH



Quality prevails – we hold on to this credo since years.

We are a manufacturer of CHP systems in two standard sizes, which can be modularly scaled up to MW capacity. Innovation and strong customer focus are the central pillars of our philosophy. Our systems reliability and high efficiency are based on in depth knowledge and continuous development.

Additionally we offer a performance guarantee for 5 years. As the only manufacturer we guarantee 7 500 operating hours per year – 8 600 have been documented already. From planning, set up, installation and remote maintenance – we are there for you with advice and support.

## CONTACT

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## FEATURES

- 130 – 250 kW<sub>th</sub> | 65 – 125 kW<sub>el</sub>
- Unadulterated wood and wood chips
- Quality of charge material: 10 % residual moisture, lumpiness G30 – G70 mm, 2 % fine content, max. 70 mm chip
- Fixed-bed process in cocurrent flow
- max. 8646 h/a operating time
- Gas utilization via motor
- Performance guarantee insurance
- List of reference plants at producer
- 80 employees
- 120 grid feeding plants
- Since 2009
- Distribution countries: EU, JP, CA, ID, CH





The innovative LiPRO wood gas plant has been engineered with separated process stages in order to be able to influence the single process-specific conditions. In the first stage within the moving pyrolysis, the volatile hydrocarbons are vaporized via a double jacket auger by using recovered heat from syngas. The complex molecules are cracked in the second stage by the oxidation outside of the solid coal bed at 1050°C, the clean degassed charcoal drops directly into the reduction zone. The injected oxygen-steam mixture via the rotating grate ensures optimum grate cooling and minimized glass ash formation. The syngas can be used in an industrial engine without intensive gas cleaning.

## FEATURES

- 70 – 110 kW<sub>th</sub> | 30 – 50 kW<sub>el</sub>
- Unadulterated wood chips
- Fuel Quality –  
Particle size: P45 (P ≥ 10 mm, P ≤ 60 mm),  
Moisture content: < 10 %
- Staged process with moving grate
- Gas utilization via industrial gas engine
- 90°C | 60°C flow/return temperature
- Required installation space: 5 x 6 x 3 m
- USP: Staged Gasification
- 7 employees
- 5 grid feeding plants
- Since 2016
- Distribution countries: worldwide

## CONTACT

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www.lipro-energy.de



ReGaWatt is your specialist for turnkey energy systems. With our KombiPowerSystem® we have developed the future of decentralized energy supply:

- Due to the updraft principle a complete burnout of the ash is achieved
- Combination with gas engines and/or ORC turbines is possible, depending on heat demand of the customer
- Very low emissions through afterburning of the engine exhaust
- No fuel drying required
- Partial load capability up to 20 %
- Tailor-made plant concepts with heat extraction as process hot water, steam or thermal oil are possible
- DeNox option available

The best technologies, we perfectly put together to your KombiPowerSystem®!

## CONTACT

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info@regawatt.de | www.regawatt.de

## FEATURES

- 600 - 4300 kW<sub>th</sub> | 300 - 2000 kW<sub>el</sub>
- Unadulterated wood, wood chips, fragmentary biomass
- Quality of charge material: 30 - 50 % (wetbasis) moisture content, lumpiness: G100, max. 20 % fine content at 11,2 mm, max. 250 mm chip
- Fixed-bed in countercurrent flow
- Gas utilization via motor, gas turbine, combustion chamber
- Up to 140°C flow temperature
- Unique selling point: indifferent to various fuel qualities by using updraft gasification
- List of reference plants at producer
- 6 grid feeding plants
- Since 2010
- Distribution countries: EU





The Stadtwerke Rosenheim (Rosenheim Municipal Utilities) introduces its own wood gasifier:

A reliable, effective and safe technology that converts wood-derived energy efficiently. Therefore operators achieve exceedingly higher power and heat outputs. During the development of the wood gasifier starting in 2007, we were able to profit from our long lasting experience in the operation of power plants.

This makes our process, the so-called 'Rosenheimer Verfahren', unique. Starting in 2015, our first gasifiers have been delivered to reference customers.

We, as a municipal utility, can provide an all-in-one solution: From the energy concept and the engineering to the operation of the plant.

## CONTACT

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## FEATURES

- 110 kW<sub>th</sub> | 50 kW<sub>el</sub>
- Untreated wood, wood chips
- Quality of feed material:  
11 % water content, lumpiness  
30 x 30 x 30 mm, 5 % fine content at  
max. 2 mm, max. 60 mm chip
- Fluidized bed and tiered process,  
combination of concurrent and eddy flow
- 42 kg/h fuel requirement at  
11 % water content
- Gas utilization via motor
- Unique selling point:  
very high gas quality, energy-efficient  
(>75 % fuel utilization rate)
- staff: 12
- since 2015
- Distribution countries: DE, AT, IT



## The fuel makes the difference.

Our biomass power plants are very flexible in terms of raw material. We can utilise all types of forest residues, such as offcuts and sawmill by-products, as fuel without limitations regarding fine or bark content. Thanks to our patented impurities-discharge, we are also tolerant against stones and nails. All this is made possible by the innovative floating fixed-bed technology, which allows both, maximum efficiency and maximum fuel flexibility and therefore offers clear economic advantages for our customers.

Experience it yourself and visit one of our reference plants.

## CONTACT

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Münchnerstr. 22  
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www.syncraft.at

## FEATURES

- 350 - 770 kW<sub>th</sub> | 200 - 500 kW<sub>el</sub>
- Modular construction for > 1MW<sub>el</sub>
- Unadulterated wood, tree and shrub cuttings, waste wood class A, wood chips
- Quality of charge material: 15 % moisture content, lumpiness: P16-P45, 20 % fine content
- Staged process in cocurrent flow (floating fixed-bed)
- max. 8400 h/a operating time
- Gas utilization via gas engine
- Installation room: 6 x 9 x 11 m
- Fuel flexibility, no additives needed, by-product: premium bio char, electric efficiency 30 %
- 6 grid feeding plants

# MEVA ENERGY AB

Meva Energy provides gasification systems for CHP or industrial process gas applications in the range of 3-15 MW gas. The continuous character of the entrained flow gasification process enables very even gas quality. The technology can be used to replace LPG and NG in industrial applications.

## CONTACT

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## FEATURES

- 2400 kW<sub>th</sub> | 1200 kW<sub>el</sub>
- Unadulterated wood, wood chips, pellets, saw dust, husks, bark and other biomass not eligible for subsidy schemes
- Quality of charge material: 12 % moist. cont., lumpiness 1 mm (otherwise grinding), tolerated fine content: 100%, 1 mm
- Entrained flow in cocurrent flow
- Gas utilization via motor, combustion chamber, conditioning and synthesis (synthesis product: industrial process gas)
- 1 grid feeding plant



# SPANNER RE<sup>2</sup> GmbH

Spanner Re<sup>2</sup> CHPs are small, decentralised cogeneration plants that generate heat and electricity from wood chips. Made and engineered in Germany, Spanner Re<sup>2</sup>'s Biomass CHPs are proven to improve efficiency in a wide range of business applications. Contact us today to learn more.

## CONTACT

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## FEATURES

- 22 - 140 kW<sub>th</sub> | 9 - 70 kW<sub>el</sub>
- Wood chips, pellets and briquettes
- Patented technology
- > 700 grid feeding plants
- > 8 200 h/a operating time
- Distribution countries: worldwide



# URBAS MASCHINENFABRIK GmbH

16 years of experience and ongoing research allow URBAS to deliver the best turnkey solutions to suit every type of client. Low input requirements and high efficiency is achieved with a plant availability of up to 98,04% per year. URBAS offers individual solutions for sustainable installations.

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<http://www.urbas.at>

## FEATURES

- 280 – 760 kW<sub>th</sub> | 150 – 450 kW<sub>el</sub>
- Unadulterated wood and wood chips
- Quality of charge material: < 15 % moisture content, lumpiness: P63, 20 % fine content, max. 150 mm chip
- Fixed-bed process in concurrent flow
- 19 grid feeding plants
- > 8000 h/a of operating time
- Distribution countries: worldwide

**URBAS**  
energietechnik



SPECIALISTS WITH  
A KEEN EYE ON  
DETAILS

SUPPLIERS

# MESSTECHNIK EHEIM GmbH



Messtechnik EHEIM, located in Schwaigern, has been your reliable partner in process & flue gas analysis for more than two decades. Based on the vision of developing a generation of innovative measuring instruments, a wide range of high performance devices have been established. The VISIT 03H is a gas analyzer of high quality for the professional analysis of pyrolysis gas as well as for the calculation of the energetic utilization process of the flue gas analysis. It is used during commissioning and maintenance as well as for process control. The device is characterized by its high measurement accuracy, even in changing operating conditions. Furthermore it provides long term measurement data.

## FEATURES

- Measurement and test engineering
- Measuring device VISIT 03-H
- Since 2005
- Partner companies: Fraunhofer Institute, various universities and technical universities, industrial clients
- Measurement for biogas plants and for firing technology
- Technology of flow measurement and industrial trucks measurement

## CONTACT

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# VÖLKL MOTORENTECHNIK GmbH



Vökl Motorentechnik was founded in 1994 as a specialist company for engine maintenance and engine tuning. Even before the first Renewable Energy Law was introduced in 2004, small and medium-sized combined heat and power plants were developed and built for the use of regenerative fuels. In the course of a research project in 2006, the first industrial engines for the use of low calorific gas have been adapted and built up to CHP units. The plant construction portfolio for wood gas CHP units starts at 30 kW and ends at 660 kW electrical power. Inhouse-CAD 3D design, comprehensive machinery with CNC processing technology, electrical department, switchgear construction, test field and well-trained and experienced employees create effective and high-technology CHP systems for use on an international level. Competence is our reference!

## CONTACT

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## FEATURES

- 30 – 660 kW<sub>el</sub> (CHP)
- CHP service, engine measurement technology
- Gas engine modification
- Engine overhaul
- Switching and control device manufacturing
- Utilization of process heat
- Concept and plant design
- 80 pyrolysis gas CHP in DE, CH, SI, AT, IT, BA, UK, JP
- Partner company: ProMethan GmbH
- Since 2006





Wildfellner has been developing and producing shaftless conveying technology for almost 40 years. The execution of our systems allows a very material friendly transport of the bulk goods. The conveyors are only guided on the geared motor side, so a more or less flexible transport is enabled – no jams, almost no abrasion of the bulk goods and thereby a transport where the amount of the fine particles is very low. The rest of the fine material is reduced to a minimum by our sieve. Normally the sieved out material is used in wood chip heating systems. Our references include horizontal conveyor tracks up to 36 m and vertical conveying systems up to 28 m with only one spiral and one geared motor. Several slider and flap systems available.

## FEATURES

- Transport, storage technology, conveyor technology
- Robust spiral conveyor up to 600 m<sup>3</sup>/h, flexible spiral conveyor up to 10 m<sup>3</sup>/h
- Conveyor technology for recycling, waste and wood industries, energy
- Wood chips G30 – G100, P16 to P63
- Tube and hutch conveyor systems
- Execution in steel and stainless steel
- 150 conveyor spirals in different sizes in stock
- Customized construction
- since 1980

## CONTACT

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# CALIDA CLEANTECH GmbH

Calida Cleantech CPP HF Hot Gas Filters are designed for synthesis gas applications up to 800°C. In combination with Dry Sorbent Injection for removal of Cl and S, and catalytic tar or NOx treatment, Calida Cleantech Filters become a central gas cleaning unit for gasification or flue gas treatment.

## CONTACT

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Info@calida-cleantech.de

www.calida-cleantech.de

## FEATURES

- Filter technology: hot gas filter up to 800°C
- CPP HF and CHF the powerful regeneration
- Without precoating
- Low pressure drop
- Robust, modular and compact



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SERVICE PROVIDERS

# FRAUNHOFER-INSTITUT FÜR FABRIKBETRIEB UND -AUTOMATISIERUNG IFF



The Fraunhofer Institute IFF is a provider of R&D for demand-driven power plants and power-to-X systems for industry, business and residential areas. We develop system solutions that integrate gas, electricity, heat, ICT, service and vehicles in advanced (bio-)energy concepts. Together with partners all over the world, we develop sites and projects for power-to-X systems.

We also accompany the development of technology for gasification, (catalytic) methanation and (catalytic) gas treatment and implement joint projects.

## FEATURES

- Planning, measurement and test engineering
- Research, process simulation and power system development
- Biomass gasification services: analysis, simulation and development
- Individual power-to-X concepts
- Site analysis, project development, economic feasibility analysis
- Since 1998

## CONTACT

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# FRIEDRICH-ALEXANDER-UNIVERSITY ERLANGEN-NUREMBERG, Chair of Energy Process Engineering



The goal of our work is to regard the whole process of biomass gasification starting from the biomass to the obtained syngas. Therefore, we have high experience in the field of thermochemical gasification and can support you in all its aspects such as tar measurements, gas and fuel analysis as well as gasification experiments. Our experimental plants allow gasification tests in fluidized beds (e. g. with 100 kW heat pipe reformer) or in a non-thermal plasma environment even with low-rank fuels.

We offer long-term expertise gained in the field of plant dimensioning and optimization focusing on thermodynamic calculations and CFD-simulations.

## FEATURES

- Consulting, measurement and test engineering, research
- Analytical & experimental services
- Heatpipe reformer technology
- Methanation & CO<sub>2</sub> removal
- catalytic gas conditioning
- Tar-Protocol & SPA-method

## CONTACT

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[www.evt.tf.fau.de](http://www.evt.tf.fau.de)

# DBFZ – DEUTSCHES BIOMASSEFORSCHUNGS- ZENTRUM gemeinnützige GmbH

Research focus is the entire process chain from biomass to energy (power, heat, synthesis products). Besides, different test plants, a wide range of different measuring technologies and simulation programs are available for research projects/services at the DBFZ and by partners.

## CONTACT

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## FEATURES

- General bioenergy research
- Planning, consulting, plant and concept evaluation, research, measurement and test engineering
- Analysis, test studies
- Fixed/entrained-flow gasifier, catalytic and adsorptive gas cleaning, synthesis reactors
- Since 2008 (former IE-Leipzig)



# EUROFINS UMWELT OST GmbH, NL FREIBERG

Eurofins Umwelt Ost GmbH is a modern laboratory within the Eurofins analytical services group specialized on solid fuel analytics. We offer chemical, physical and biological analyses for the environmental, industrial and energy sector. Our services range from sample taking, sample pick up, analytics of common and special parameters and evaluation to development of new testing methods.

## CONTACT

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## FEATURES

- Chemical analysis of biochar, solid biofuels
- Routine lab for fuel analytics, analytics of slags and ashes, wooden pellets and waste
- Accredited according DIN EN ISO/IEC 17025
- Partner companies: TU BAF, UVR-FIA, DBI, GEOS
- Established in 1990
- 125 employees in Freiberg



# FACHAGENTUR NACHWACHSENDE ROHSTOFFE e.V. (FNR)

The FNR, specialized agency for renewable raw materials, is a project management agency within the framework of the Federal Ministry of Food and Agriculture (BMEL). Next to supporting and coordinating research, development and demonstration projects concerning renewable raw materials, it oversees – among others – research projects within the scope of the BMEL-funding programme “Renewable raw materials” and R&D projects in regard to bioenergy on the basis of the energy and climate fund.

## CONTACT

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## FEATURES

- Project funding
- Science and consumer information (market overviews, guidelines, basic data etc.)
- Coordination of EU projects in the field of renewable raw materials

## :METABOLON RESEARCH SITE

The research project :metabolon focuses on the field of sustainable resource efficiency and circular value creation. Innovative processes are investigated to produce secondary resources from residuals. Cascaded material use as well as energetic utilization is studied to preserve primary raw materials.

## CONTACT

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## FEATURES

- Interdisciplinary research and networking
- Measurement and test engineering
- Partners: TH Cologne, RWTH Aachen, BAV
- Semi-industrial scale plants for material treatment and conversion, i.a. biomass gasification; analytics and measurement, mechanical treatment, conditioning



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für regionale Entwicklung

# FRAUNHOFER INSTITUTE FOR ENVIRONMENTAL, SAFETY, AND ENERGY TECHNOLOGY (UMSICHT)

Since 1994 Fraunhofer UMSICHT develops concepts for biomass power plants for combined heat and power generation based on fluidized bed gasification ranging from 1 – 20 MW fuel input. Additionally, we offer manifold consultancy from concept development to gasification test runs.

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## FEATURES

- Planning and research
- Safety consulting, site development, biomass gasification test runs and economic assessment
- Gas cleaning and synthesis gas chemistry
- Since 1994



# UNIVERSITY OF APPLIED SCIENCES ZITTAU/GÖRLITZ

Research priorities and practical tasks in the field of energy and the environment can be covered by the transfer of knowledge in a wide range of fields, e. g. electrical engineering, process engineering, automation technology, energy management, environmental management, chemistry, soil ecology.

## CONTACT

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## FEATURES

- Planning, support, measuring, research, laboratory analyses
- On-site investigations
- Energy and power plant engineering
- Fuel analysis, thermochemical test area, combustion technology, latent heat storage systems
- Since 2007



Hochschule  
Zittau/Görlitz  
UNIVERSITY OF APPLIED SCIENCES

# IEA BIOENERGY TASK 33 – GASIFICATION OF BIOMASS AND WASTE

Our objectives are to monitor, review and exchange information on biomass gasification research, development, demonstration and to promote cooperation among the participating countries and industry to eliminate technological impediments to the advancement of thermal gasification of biomass.

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[www.ieatask33.org](http://www.ieatask33.org)

## MERKMALE

- Networking, event organisation
- Newsletter, reports, etc.
- Partner organisation:  
[www.ieabioenergy.com](http://www.ieabioenergy.com)
- since 1978



## PROFESSIONAL GAS ENGINE SOLUTIONS GmbH

Resulting from many years of experience in the field of using product gas for power generation, we offer consulting services in regard to planning and optimization of conversion aggregates. We will find the best solutions for your projects quickly and non-bureaucratically through our extensive network of partner companies.

## CONTACT

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## FEATURES

- Planning and consulting
- Independent consulting regarding power generation from wood gas
- Technical support concerning conceptual design of CHP
- Support for the usage of biogas, synthetic gas and natural gas
- Expertise in case of damages



# RECHTSANWALT ALBERT HASENSTAB

German lawyer (Rechtsanwalt) Hasenstab has long-time experience in the field of renewable energy and biomass gasification. He is experienced in civil and administrative cases and in hearings of grid operators and approving authorities.

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www.rahamenstab.de

## FEATURES

- Legal system
- Consulting
- EEG law, licensing law, contract law, labour law
- Restructuring consulting



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# CIVIL ENGINEER OFFICE FOR ENERGY AND ENVIRONMENT (ZTL)

Dr. Lettner researched within the frameworks of TU Graz in regard to biomass gasification plants from 2001 to 2008. Since then he is an independent engineer consultant and works as planner, advisor and judicial assessor. Next to balancing and modelling tools, a well-equipped measurement and analysis machine park is available for the field of biomass conversion plants.

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## FEATURES

- Planning, consulting, safety engineering, measurement and test engineering, research
- Planning and organization of FW systems (via DHFOS®), CHP modules and special conversion plants
- Independent expert
- since 2001



# NATIONAL AND INTERNATIONAL ASSOCIATIONS

|                    |   |  |
|--------------------|---|--|
| <b>World</b>       | Bioenergy International                             | <a href="http://www.bioenergyinternational.com">www.bioenergyinternational.com</a><br><a href="mailto:Dorota.natucka@bioenergyinternational.com">Dorota.natucka@bioenergyinternational.com</a> |
| <b>World</b>       | World Bioenergy Association                         | <a href="http://www.worldbioenergy.org">www.worldbioenergy.org</a><br><a href="mailto:bharadwaj.v.kummamuru@worldbioenergy.org">bharadwaj.v.kummamuru@worldbioenergy.org</a>                   |
| <b>Europe</b>      | European Biogas Association                         | <a href="http://www.european-biogas.eu">www.european-biogas.eu</a><br><a href="mailto:info@european-biogas.eu">info@european-biogas.eu</a>   |
| <b>Europe</b>      | European Bioenergy Research Institute (EBRI)        | <a href="http://www.aston.ac.uk/ebri">www.aston.ac.uk/ebri</a><br><a href="mailto:bioenergy@aston.ac.uk">bioenergy@aston.ac.uk</a>   |
| <b>Europe</b>      | European Biomass Association                        | <a href="http://www.aebiom.org">www.aebiom.org</a><br><a href="mailto:info@aebiom.org">info@aebiom.org</a>   |
| <b>Belgium</b>     | Valorization of Biomass (VALBIOM)                   | <a href="http://www.valbiom.be">www.valbiom.be</a><br><a href="mailto:a.dossogne@valbiom.be">a.dossogne@valbiom.be</a>   |
| <b>Bulgaria</b>    | Bulgarian Biomass Association                       | <a href="http://bgbiom.org">bgbiom.org</a><br><a href="mailto:anna@bgbiom.org">anna@bgbiom.org</a>   |
| <b>Denmark</b>     | Danish Bioenergy Association                        | <a href="http://www.bioenergi.di.dk">www.bioenergi.di.dk</a><br><a href="mailto:mipe@di.dk">mipe@di.dk</a>   |
| <b>Germany</b>     | Bundesverband Bioenergie e.V. (BBE)                 | <a href="http://www.bioenergie.de">www.bioenergie.de</a><br><a href="mailto:info@bioenergie.de">info@bioenergie.de</a>   |
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| <b>France</b>      | CoopEnergie   | <a href="http://www.coopenergie.com">www.coopenergie.com</a><br><a href="mailto:flamin.coopenergie@hotmail.fr">flamin.coopenergie@hotmail.fr</a>   |
| <b>Greece</b>      | Hellabiom – Greek Biomass Association               | <a href="http://www.cres.gr">www.cres.gr</a><br><a href="mailto:mchrist@cres.gr">mchrist@cres.gr</a>   |
| <b>Ireland</b>     | Irish BioEnergy Association: IrBEA                  | <a href="http://www.irbea.ie">www.irbea.ie</a><br><a href="mailto:noelgavigan@irbea.org">noelgavigan@irbea.org</a>   |
| <b>Italy</b>       | AIEL – Associazione Italiana Energie agroforestali  | <a href="http://www.aiel.cia.it">www.aiel.cia.it</a><br><a href="mailto:aiel@cia.it">aiel@cia.it</a>   |
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| <b>Latvia</b>      | LATBIO – Biedrība Latvijas biomasas asociācija      | <a href="http://www.latbio.lv">www.latbio.lv</a><br><a href="mailto:didzis.palejs@latbio.lv">didzis.palejs@latbio.lv</a>   |
| <b>Lithuania</b>   | LITBIOMA – Lietuvos biomasės energetikos asociacija | <a href="http://www.biokuras.lt">www.biokuras.lt</a><br><a href="mailto:asociacija@biokuras.lt">asociacija@biokuras.lt</a>   |
| <b>Luxembourg</b>  | Luxemburg Energy Agency                             | <a href="http://www.energieagence.lu">www.energieagence.lu</a><br><a href="mailto:info@energieagence.lu">info@energieagence.lu</a>   |
| <b>Netherlands</b> | Platform Bio-Energie                                | <a href="http://www.platformbioenergie.nl">www.platformbioenergie.nl</a><br><a href="mailto:info@platformbioenergie.nl">info@platformbioenergie.nl</a>   |

|                       |   |   |
|-----------------------|---|---|
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| <b>Austria</b>        | Österreichischer Biomasse-Verband   | www.biomasseverband.at<br>office@biomasseverband.at |
| <b>Poland</b>         | POLBIOM – Polskie Towarzystwo Biomasy                                     | www.polbiom.pl<br>polbiom@poczta.onet.pl            |
| <b>Portugal</b>       | CEBio – Associação para a promoção da Bioenergia                          | www.ceb.io.net<br>jt@ceb.io.net                     |
| <b>Romania</b>        | Asocia ia Română Biomasă și Biogaz (ARBIO)                                | www.arbio.ro<br>office@arb.io.ro                    |
| <b>Sweden</b>         | Swedish Bioenergy Association (SVEBIO)                                    | www.svebio.se<br>kjell.andersson@svebio.se          |
| <b>Switzerland</b>    | Biomasse Suisse   | www.biomasseschweiz.ch<br>contact@biomassesuisse.ch |
| <b>Slovakia</b>       | BIOMASA   | www.biomasa.sk<br>biomasa@biomasa.sk                |
| <b>Slovenia</b>       | Slovenian Energy Agency   | www.agen-rs.si<br>info@agen-rs.si                   |
| <b>Spain</b>          | La Asociación Española de Valorización Energética de la Biomasa (AVEBIOM) | www.avebiom.org<br>biomasa@avebiom.org              |
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