

EUROPEAN SUPPLIERS OF WASTE-TO-ENERGY TECHNOLOGY



ACTIVITY REPORT 2017

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Credits

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ESWET PROFILE

Spittelau Waste-to-Energy Plant

ESWET IS THE ASSOCIATION GROUPING THE FUROPEAN SUPPLIERS OF WASTE-TO-ENERGY TECHNOLOGY. OUR MAIN PURPOSE IS TO FOSTER THE DEVELOPMENT AND DISSEMINATION OF WASTE-TO-FNFRGY.

Waste-to-Energy (also called Energy-from-Waste) has an important role to play both on the energy recovery and on the environmental aspects of managing waste that is not suitable for recycling. Waste-to-Energy is an integral part of sustainable waste management, as reflected by its role in the Waste Hierarchy of the EU's Waste Framework Directive, acting in complement to recycling while enabling landfilling minimisation.

Energy is a solution to multiple challenges.

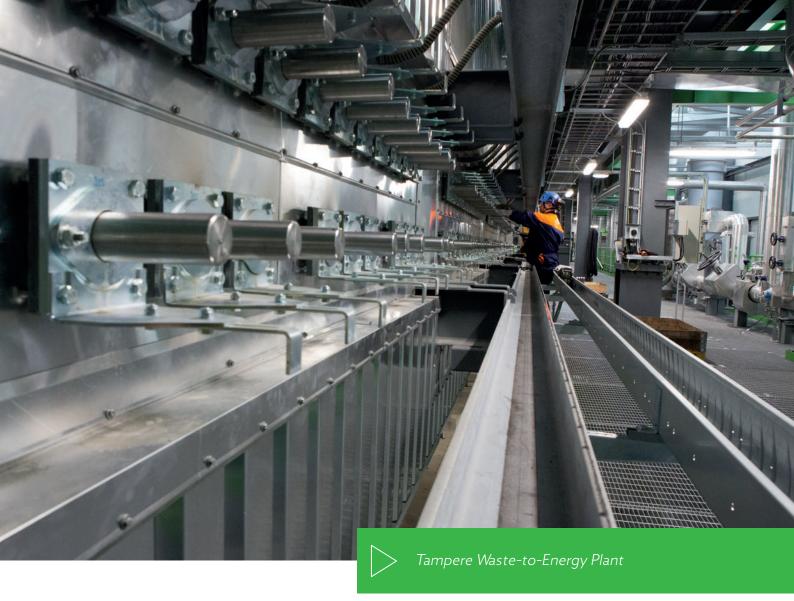
Why does ESWET work at the European level?

Most of the national environmental legislation in Europe is derived from EU Policies. Furthermore, there is continuous debate on Waste-to-Energy within the European Institutions.

Many policy-makers already recognise and support Waste-to-Energy's important role in the waste management sector and as an energy Making a valuable contribution to the reduction source. Since still more needs to be done to raise of Greenhouse Gas emissions through better positive awareness, ESWET will continue to share waste management and cleaner energy, Waste-to- facts about the technology with the European decision-makers.

WASTE-TO-ENERGY IN THE WASTE HIERARCHY





WASTE-TO-ENERGY...

- · is an essential part of a sustainable waste · management strategy: it is complementary to recycling by treating waste that is not suitable for material recovery and would otherwise be landfilled
- meets the EU legislation aimed at minimising emissions; the EU environmental standards for Waste-to Energy plants are the strictest of all combustion industries
- is a 'recovery' operation when meeting EU energy efficiency criteria. It can make energy from waste available for external use at high efficiency (e.g. district heating and cooling, process steam and electricity)

- helps fight climate change by:
- · avoiding methane emissions from landfilling
- · recovering energy from any form of carbonneutral biomass
- offsetting the use of fossil fuels for energy generation
- isolates harmful substances contained in waste, ensuring their removal from the ecocycle through either destruction or safe disposal
- performs 'urban mining' by recovering the energy and materials contained in residual waste, an indigenous source of energy and resources for Europe
- · is a reliable and proven technology, developed in Europe and exported worldwide

VALUE YOUR WASTE!

IN 2017, THE EUROPEAN INSTITUTIONS KEPT WORKING TO TACKLE ONE OF THE BIGGEST SOCIETAL CHANGE WE ARE FACING: THE TRANSITION TOWARDS A SUSTAINABLE LIFE THAT VALUES RESOURCES, WITH SMART ENERGY AND GREEN CITIES. THIS WILL DEEPLY IMPACT THE ENVIRONMENT AND ENERGY SECTORS AS WELL AS FUROPEAN CITIZENS AND INDUSTRIES.

ESWET followed this work closely, with the consider the amount of methane emissions saved strong belief that Waste-to-Energy will be one by diverting waste from landfilling. cornerstone to pave the way for the sustainable world of tomorrow, thanks to the multiple benefits embedded in it.

In line with the Waste Hierarchy of the European Commission, at ESWET we firmly believe in the need to prevent waste and foster recycling that is technically and economically viable. As a consequence we will re-value our waste and respond to multiple challenges of today's world, thanks to thermal treatment.

Firstly, using waste as a fuel for energy production will help us substituting fossil fuels, reducing CO, emissions while still granting a dispatchable and secure energy supply. The fight to mitigate climate change will be even more significant if we



Thanks to the work done by ESWET and its members during 2017, we have proven that we can fight misconceptions about thermal energy recovery of waste and show the added values that it brings to the environment



There may be waste keeping your roads stable and safe!

Moreover, we have to take into consideration the essential connection with District Heating and Cooling infrastructures. State-of-the-art Waste-to-Energy plants improve efficiency of district heating networks that can use a local feedstock: waste. This creates a win-win situation where we are diverting waste from landfilling while feeding energy into entire neighbourhoods and cities. Have you ever thought about waste warming your house?

Finally, another advantage of Waste-to-Energy is that through the thermal treatment of waste we are able to recover materials such as minerals and metals, which can be reused and will be again part of the economy. For example, bottom ash from incineration can be used as an aggregate for construction purposes. There may be waste keeping your roads stable and safe!

Thanks to the work done by ESWET and its members during 2017, we have proven that we can fight misconceptions about thermal energy recovery of waste and show the added values that it brings to the environment. 2018 is going to be the year when everyone will recognise the benefits of Waste-to-Energy for society as part of an integrated waste management as well as its contribution to the Circular Economy. Technical progresses made in our sector and consequential high environmental performances are now ensuring that Waste-to-Energy is a solution, not a problem. The time of just burning garbage is in the past! We cannot waste the multiple opportunities coming from it.



Edmund Fleck ESWET President

BYDGOSZCZ: A WASTE SUCCESS STORY

MR RAFAŁ BRUSKI, MAYOR OF BYDGOSZCZ IN POLAND, TELLS US THE STORY BEHIND THE BYDGOSZCZ WASTE-TO-ENERGY PLANT AND ITS ROLE IN THE CITY'S GREEN STRATEGY

2015. What is your assessment on the outcomes of this plant this far?

I remember very clearly the birth of an idea, which was accompanied by rather negative opinions of citizens of Bydgoszcz. With an effort that both decision-makers and local communities have had undertaken, this project is now regarded as a success, even at national level – since Bydgoszcz pursuit to be the leader has been accomplished. With facts against the myths we managed to coin dialogue with non-believers. Nowadays it is a common thing to hear that thermo-utilization plant is neither a threat, nor a silly idea at all. It is both smart and reasonable. What is more, since the communal company that manages the plant - ProNatura - has grown to be one of the leading names in the industry at national level, it builds an added value to the investment.

This facility generates enough electricity to power and provide heat to almost 50,000 households each year. How has this helped the local community of Bydgoszcz?

By connecting the plant to city's grid we are not only able to use the plant's capability but also secure the heat demands levels. Heat and electricity are 'not seen' by citizens, but the role of the City is to fulfill the needs and even more - to anticipate. And therefore what is regarded as a farsighted management is yet a reality! ProNatura's effort to educate and get involved in various activities is also a direct benefit for the locals. With an "open door" policy of the company,

The plant was granted permission in November thousands of visitors from pupils to seniors it has become a true "Point of Interest" and even acts as an attraction. Bydgoszcz has vast experience in development of communal services. The plant along with well managed waste collection system and modern waste water installations are regarded as an example of "how to" by many Polish cities. Also thanks to the plant, the costs of utilization are being kept in grip, which is very important for the taxpayers.

How did this plant, one of the largest Waste-To-Energy developments in Poland, help Poland meet its obligations under the European Union's 2020 climate and energy directive?

The plant is a renewable energy source, which fulfills the directive. However it cannot be seen as a separate factor in city's "green strategy".



Most importantly, thanks to the technology, the emission of greenhouse gases is no longer an issue in Bydgoszcz.



In Bydgoszcz we undertake various initiatives and programmes devoted to environment (i.e. reducing low emission, LED city lights, etc.). Most importantly, thanks to the technology, the emission of greenhouse gases is no longer an issue in Bydgoszcz.

What would you recommend to other regions/ cities in Europe, who are still skeptical about the effects a waste incineration plant can have for the local community?

Come to Bydgoszcz! See the plant, meet the staff, ask questions. Look up the numbers – there are more than 400 Waste-To-Energy plants in Europe. It is not a coincidence. Not only is it a good asset to the local economy, but a boost to the cooperation with surrounding communes. It is a "must have" for each city, aspiring to the role of regional metropolis.



Rafał Bruski Major of Bydgoszcz, Poland

HOW CIRCULAR IS THE CIRCULAR ECONOMY?

BEFORE THE 70s BARELY ANYONE TALKED ABOUT CIRCULARITY OF PRODUCTS. THE NORM WAS TO PRODUCE-USE-LANDFILL. WHICH IS TODAY DEFINED AS A LINEAR SYSTEM. CONCEPTS PROPOSING CRADLE-TO-CRADLE THINKING OR THE ECONOMY IN LOOPS WERE NUDGING PEOPLE OUT OF THEIR COMFORT ZONES. THIS IDEA WAS EMBRACED BY SOME INDUSTRIALS ONLY IN THE 80s.

the "loops". From the first report written in 1976 by Walter Stahel and Genevieve Reday the thinking made its way inside the institution to culminate into the Towards a circular economy: A zero waste programme for Europe communication in 2014.

The circular economy and the efforts to get there, referred to as "closing the loop", does not always follow a strict definition. The cradle-to-cradle approach defines a framework for designing products and industrial processes that turns materials into nutrients by enabling the formation of cyclical material flow systems¹. Dr Braungart defines two cycles, the biological and the technical one, each of them having as final "waste" a nutrient for new products in their respective cycle. Therefore, he defines Waste as Food.

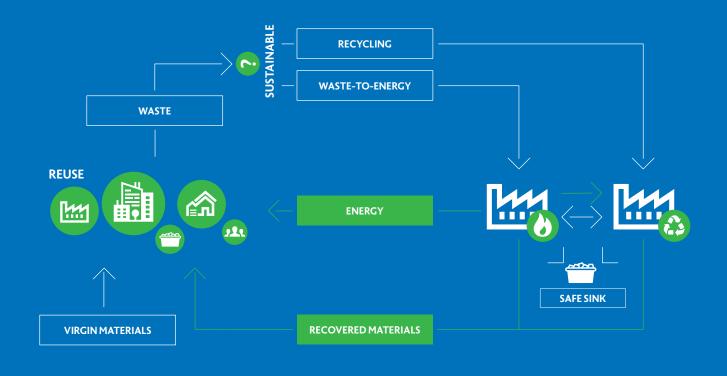
The European Commission was always a driver of In 2002 Dr Braungart recognises that recycling always implies "downcycling"². A product can only be used in its original condition a given time and there is an urgent need to design more often recyclable products. Introducing virgin material or other products into the recycled one could



There is no added value from an environmental point of view to invest energy, machines, manpower and potentially chemicals to create a product which has no useful purpose.

Michael Braungart: http://www.braungart.com/en/content/c2c-design-concept ² William, McDonough; Michael Braungart (2002). North Point Press, ed. Cradle to Cradle: Remaking the Way We Make Things. North Point Press pp. 56–57. ISBN 978-0-86547-587-8

³ Article 6 (1) and (2) of the Waste Framework Directive 2008/98/EC





Adapted from article by Van Caneghem J., Van Acker K., De Greef J., Wauters G., Vandecasteele C. The role of waste-to-energy in the circular economy. Submitted to Waste Management, March 2018.

increase the recyclability and the material use. But there is a definite end to the useful life of virtually all the material or try to generate energy out of it. It's this easy! Therefore circular economy should

The terminology emerging in order to make a distinction between "good" and "bad" recycling is "quality recycling", but without a clear definition. The European Commission in order to count it as recycled asks for the recyclate to be taken up by the market³. There is no added value from an environmental point of view to invest energy, machines, manpower and potentially chemicals to create a product which has no useful purpose. One must not mix the aims and the tools! The overarching aim is to reduce the environmental impact while the circularity approach and recycling are tools, which must be submitted to an environmental impact assessment to understand when recycling is an added environmental value and when not.

So, what should be done with a product that has been downcycled to the point that quality recycling is not possible or where the environmental impact assessment shows that it has a negative environmental impact if recycled compared to thermal treatment?

The options are limited. One could either dump all the material or try to generate energy out of it. It's this easy! Therefore circular economy should always use the smallest cycle (e.g. re-use complete devices), before going to the next cycle (e.g. recycle the material back to a useful material). The ultimate cycle will be the thermal energy recovery that brings energy back to the economy and that will power the production of new raw materials or products.

This is why a truly circular economy circulates materials and energy.



Patrick Clerens ESWET Secretary General

PLASTICS STRATEGY AND QUALITY RECYCLING

PLASTICS CONSTITUTE AN IMPORTANT PART OF OUR LIVES, AS THEY CAN BE FOUND EVERYWHERE, FROM OUR FOOD PACKAGING TO CHILDREN'S TOYS AND OUR CARS, AND THEY HAVE PROVEN THEIR USEFULNESS OVER THE YEARS.

However their use does not always brings the best
The European Commission's fight on plastics results both for citizens and the environment. A great amount of plastics is only used once before being thrown away, ending up polluting the environment and depriving the economy of a valuable resource. In an ideal world, we would be able to indefinitely recycle plastics and the materials that go together. But in reality, around 30% of plastics in the EU end up in landfills due to the fact that they can no longer be reused and recycled.

But, no need to think that everything is doom and gloom. Energy recovery through Waste-to-Energy is, in certain cases, a better solution, since it offers both the transformation of end-life plastics into something new, and even better, into energy, thereby increasing resource efficiency.

The European Commission in 2017 started working on a Strategy for Plastics, a nonlegislative communication setting the way for future legislative developments in the area of recycling, "...to have all plastic packaging reusable or recyclable in a cost effective manner by 20301".

It is an ambitious commitment, aiming at ensuring a better transition towards the circular economy, complementing existing measures targeting plastics by providing a systemic perspective and creating synergies with other actions that will improve the economics, quality and uptake of plastics recycling and reuse

Recycling, reuse...what about left-overs?

A better quality of plastics' recycling is the starting point towards a more circular economy, however other solutions exist and may even suggest more sustainable solutions. With respect to the principles of Waste Hierarchy, a proper

¹ European Commission, Plastics factsheet, Turning today's challenges into opportunities – a European strategy for plastics in a circular economy. URL: https://ec.europa.eu/commission/sites/beta-political/files/plastics-factsheetchallenges-opportunities_en.pdf



waste management should be based on a more integrated approach. This is why energy recovery can be the best option when dealing with plastics not suitable for recycling. This approach is also endorsed by EU legislation, as, according to the Waste Framework Directive, options delivering best environmental outcomes should be encouraged.

When treating plastics, there is the need to first asses the environmental and health impacts before choosing the best waste treatment methods. A truly circular economy maximises the value of resources by reusing and recycling them as much as possible, and then using their energy. This is why, instead of landfilling, Waste-to-Energy is the best option since it deals with plastics not suitable for recycling and recovers essential energy.

What to expect from China Ban in 2018?

The Chinese government informed in July 2017 that China will ban the import of 24 categories of solid waste, including recyclable plastics, by 1 January 2018. Up until now, 87% of exported recyclable plastic from the EU went to China (directly, or indirectly via Hong Kong). Will this situation force Europe to confront an increasing waste problem? Even though assumptions rise that EU waste exports will continue to other countries, Europe must seize the opportunity to create a better and more sustainable market for solid waste, where Waste-to-Energy will be put into value.



A truly circular economy maximises the value of resources by reusing and recycling them as much as possible, and then using their energy.

RENEWABLE ENERGY DIRECTIVE AND CASCADING USE OF **BIOMASS**

2017 MARKED THE YEAR THE FUROPEAN UNION TOOK THE LEAD IN THE TRANSITION TOWARDS AN ENERGY MARKET FOCUSED ON RENEWABLES.

The European Union's commitment to the Paris recovery is in capacity of achieving both of these Agreement needs to be translated into ambitious targets and practical measures that will help Renewable Energy Directive, introduced on 30 November 2016 by the European Commission, is on the right way towards establishing an overall policy for the production and promotion of energy from renewable sources in the EU, and ESWET fully supports this proposal.

However, this transition needs to be also executed in a manner that will ensure security of of waste, and using waste biomass, energy

ambitious goals. After all, the current Renewable Energy Directive recognises energy recovered in mitigate climate change. The proposal for a revised Waste-to-Energy plants from municipal waste of biological origin as renewable.

Cascading use of biomass: achieving the circular economy goals

Waste-to-Energy recovers energy from biomass that is not of sufficient quality to be recycled, generating electricity and heating, thus ensuring security of energy supply for many Europeans. energy supply for all Europeans. And this is where Moreover, treating waste of biological origin Waste-to-Energy comes in to play an important in Waste-to-Energy plants prevents methane role. By recovering energy from different types emissions from landfills. Methane, released

¹ N. Walczak, in F. Simon article 'EU warned against renewables law 'subverting' the circular economy', EURACTIV.com, 12.09.2017



during the decomposing of biomass, is much more harmful for the climate than ${\rm CO_2}$. It is safe to say, thermal recovery of energy from waste of biological origins contributes to climate change mitigation.

ESWET therefore believes that support for renewable energy should be technology neutral as long as a given renewable source is sustainable. Hence, in order to maintain a level playing field, the biomass fraction treated in Waste-to-Energy plants should be treated equally to any other biomass used to generate energy.

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"It is in nobody's intention to build a waste-to-energy plant for burning biomass. The first function is to treat waste. But if there is biomass that can be treated as renewable, why not?"

WI BREF REVISION **PROCESS**

BRUSSELS USUALLY SLOWS DOWN DURING THE SUMMER AS EVERYONE ENJOYS THEIR WELL-DESERVED HOLIDAYS. BUT NOT IN 2017! IN MAY, THE EUROPEAN INTEGRATED POLLUTION PREVENTION AND CONTROL BUREAU (EIPPCB) RELEASED THE DRAFT WASTE INCINERATION (WI) BREF. MEANING THAT ESWET AND OTHER STAKEHOLDERS WERE TO SPEND THE FOLLOWING MONTHS ON REVIEWING THE HEFTY DRAFT. AND THE WORK CONTINUES IN

But first things first. BREF is...what?

BREF stands for Best Available Techniques (BAT) Reference Document. In addition to describing sustainable technological solutions used in different industries, BREFs set emission levels that are associated with BATs, the so-called BAT-AELs. The goal of the document is to encourage the use of the most environmentally friendly and efficient technologies in all industries. This is the reason why every European industrial sector is covered chemicals industry.

Since the entry into force of the Industrial Emissions Directive (IED) in 2011, the BREF's chapter on BAT-AELs has changed, now being called the BAT conclusions. While, in the past, BAT-AEL values were only indicative, they are now · considered legally binding, and need to be taken into account by authorities issuing operating permits for Waste-to-Energy plants and be . respected by plant operators.

The review process

The first BREF for the Waste-to-Energy sector was published in 2006. The first Draft released in May 2017 is based on this original text, but it also The revision process continues throughout 2018 – takes into account technological developments and ESWET will definitely stay vigilant! that have happened during the last 10 years. The

review process started in 2014 and included the collection of emissions' data from the European Waste-to-Energy plants. ESWET was also active in the discussions on the review from the very beginning, providing comments to the EIPPCB with regards to Waste-to-Energy technology.

The content

In the Draft, the most important changes were made in the chapter dedicated to the BAT by a separate BREF, or even several ones, like the Conclusions. BAT-AELs were updated, and in most cases the proposed values are more stringent that the current ones.

> While reviewing the Draft, ESWET made multiple comments that can be summarised in the following points:

- BAT-AELs should be based on the widest possible data sets in order to ensure that they reflect real operating conditions;
- The derivation method for BAT-AELs should be made clearer:
- BAT-AELs for different pollutants need to be designed in such a way that they can be achieved jointly;
- Other factors, such as reagent and energy use, also need to be taken into account.



Glossary:

BAT: Best Available Technique **BREF**: BAT Reference Document **BAT-AEL**: BAT Associated Emissions Levels

EIPPCB: European Integrated Pollution Prevention and Control Bureau (part of the European Commission)

IED: Industrial Emissions Directive

What is the right value for a BAT-AEL?

When setting BAT-AELs we need to remember about the goal of the whole exercise – limit the environmental impact of an industrial activity.

If existing BAT-AELs are already very low, lowering them even further might have no big difference for the environment. However, it might be disproportionally costly for both suppliers and operators.

Moreover, it is important to remember that each Waste-to-Energy plant is different, and so there is no possibility to have a one-fits-all approach. It is therefore important to set BAT-AEL values that can be achievable by all plants, and not only the ideal plant.

ESWET ACTIVITIES 2017

JANUARY

On the 30th of January ESWET organised a Media Breakfast to inform journalist about the newly launched Communication of the European Commission on Waste-to-Energy, underlying the essential role of Waste-to-Energy in the Energy Union and the Circular Economy.



APRIL



The Spring Edition of the European Energy Innovations magazine features an article on the Future of Waste-to-Energy written by Mr Patrick Clerens, ESWET Secretary General and Ms Natalia Walczak, ESWET Policy Officer until November

FEBRUARY

On the 9th of February ESWET held its annual workshop with the title "The Future of Waste-to-Energy". The event gathered almost 100 participants from the industry, regulators, NGOs and other stakeholders. Mr Jose Jorge Diaz del Castillo from DG Environment of the European Commission explained how Waste-to-Energy can be adapted so that it is fit for purpose of dealing with unrecyclable waste while contributing to the EU's energy system.





MAY

On the 15th of May Ms Walczak was invited to share the vision of our industry at the Public Hearing of the European Economic and Social Committee on Waste-to-energy under the Circular Economy.

On that same day in Glasgow, Mr Patrick Clerens moderated a panel discussion at the Congress of Euroheat & Power, the international network for district heating.



MARCH

On the 9th of March ESWET Secretary General, Mr Patrick Clerens, was invited to present Waste-to-Energy's role and technologies for the Circular Economy at the APESB Workshop in Lisbon, Portugal. On the 19th-23rd of March, ESWET attended the Final Meeting of the Technical Working Group for the Waste Treatment (WT) BREF, during which the industry had the opportunity to disseminate and support its comments to the document.

ESWET entered the Twitter world with a brand new account: @ESWET_EU!







JUNE

On the 6th of June ESWET, together with CEWEP and FEAD, published a joint reaction to the adoption of the Draft 1 of the Waste Incineration (WI) BREF welcoming some BAT conclusions while stressing the importance of certainty of measurement for RATAFI s

On the 8th of June Mr Patrick Clerens took part in the ASTEE Congress where he was invited to present the lessons learnt from the Large Combustion Plants BREF revision process.

The same month, ESWET's Secretariat took part in field trips in France in the context of the WI BREF discussions.



SEPTEMBER

September was a very busy month for the Secretariat, reacting with various positions papers to the Strategy on Plastics of the European Commission and the revised Renewable Energy Directive. You can find more about our positions in this report!

On the 18th of September, Mr Patrick Clerens attended the IRRC conference in Wien where he informed the audience about the Impact of EU Legislative Developments on the Waste-to-Energy sector. A manuscript on the topic written together with Ms Walczak was released on the book Waste Management vol.7.

On the 19th of September ESWET was represented at the 3rd International Conference Logistyka Odzyskuthe in Wroclaw by Dr John Rizzon, from the member company MHPSE. Dr Rizzon showcased the State of Waste-to-Energy market in Europe.



DECEMBER

Throughout December ESWET continued its work on the revision of the WI and WT BREFs, attending a workshop on the WI BREF in Seville and participating in the delivery of the opinion of the IED Article 13 Forum on the WT BREF in Brussels.

OCTOBER



In October ESWET joined other 118 European industrial associations in signing the paper "For an ambitious EU industrial strategy: going further", reacting to the Communication from the European Commission "Investing in a smart, innovative and sustainable Industry: a renewed Industrial Strategy for Europe".

Ms Natalia Walczak authored an article on the multiple added values of Waste-to-Energy in a special issue of the Polish magazine Logistyka Odzysku (Journal of Reverse Logistics) devoted to the Circular Economy.

NOVEMBER

ESWET, together with other associations (CEWEP and FEAD), published an updated version of the report by INERIS Institute addressing the question of performance of monitoring techniques for air emissions, in particular in the framework of the Industrial Emissions Directive (IED) with implications on the drawing up of BREFs and BATAELs.





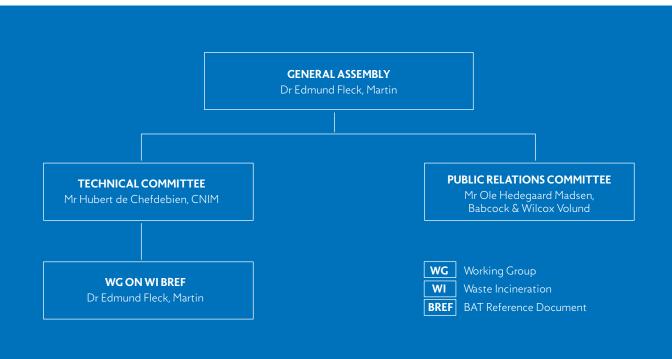
ORGANISATIONAL STRUCTURE

General Assembly

The decision-making body within ESWET is the General Assembly, where top representatives of the member companies meet to determine the policies and working of the association.

Public Relations Committee

The Public Relations Committee defines the way ESWET communicates. It covers a broad range of tasks, from organising ESWET-branded events and workshops to ensuring the visibility of the Association by creating attractive campaigns and slogans. As ESWET engages with a wide range of people, the Committee identifies the appropriate level of communication, ranging from industry and technical exchange to simple explanation of how Waste-to-Energy works.





Technical Committee

The Technical Committee reviews the policies and legislation set by the EU and determines ESWET's position on them.

Working Group on BREFs

The Working Group on BREFs was established for the purpose of preparing the review of the Waste Treatment and Waste Incineration BREF under the new rules of the Industrial Emissions Directive.

The Secretariat

The ESWET Secretariat is in touch with representatives of all member companies. It provides support to the Members when they have special needs and also acts as the contact and follow-up point with the EU Institutions. The Secretariat is glad to handle questions from the public and promotes Waste-to-Energy in a large number of events.

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