

ETN is a non-profit association bringing together the entire value chain of the gas turbine technology community in Europe and beyond. Through the cooperative efforts of our members, ETN facilitates gas turbine research and technology development, promoting environmentally friendly stationary gas turbine technology with reliable and low cost operation.

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Christer Björkqvist
Managing Director

ETN Advancements on Initiatives

In a situation where both the power generation and oil and gas sectors need to cut cost and risk related to gas turbine operations, cooperation opportunities among the whole value chain need to carefully be explored. This can effectively be done by addressing the issues that hurt the most from an economical point of view, with a wide approach that reviews both horizontal and vertical R&D project opportunities, standardisation projects, educational needs as well as legal regulations.

In April, ETN successfully held its 11th AGM in Dublin and I was very pleased with the high participation and lively discussions. We now follow-up on both ongoing and new initiatives as well as continue our efforts to collect feedback on technical issues that are of highest concerns for the user community for both power generation and mechanical drive. All of this will be addressed at our upcoming workshop on 21-22 October 2015 in Madrid, Spain hosted by Gas Natural Fenosa.

Since the beginning of 2015, ETN has welcomed eight new members and among them I am delighted to announce our first member from the insurance sector. I believe it is very important that a close relationship and technical understanding are being established between insurance companies, suppliers and the gas turbine user community. Hopefully more members from this sector will follow.

Another exciting development is the strengthening of ETN's Working Group on Air Filtration, chaired by Peter Hall, E.ON Technologies and co-chaired by Alex Straver, Shell and Olaf Brekke, Statoil. The Working Group is now an official member of the ISO Technical Committee 142 (Cleaning equipment for air and other gases) and actively involved in the drafting of the ISO29461 (Air intake filter systems for rotary machinery - Test methods). The group is also considering the initiation of an independent ETN test on air filtration for gas turbines with the objective to evaluate the performances of single filter elements in the complete system as well as evaluating the ageing effect on the filters. You can follow the latest developments of the Air Filtration Project on the ETN website under "Committees & Projects".

Over the last two and half years, a lengthy process has taken place related to the interpretation of what is BAT (Best Available Techniques) under the Industrial Emission Directive (IED) for Large Combustion Plants. The development of the document called BREF (Best Available Techniques Reference Document) that was supposed to give guidance of how to interpret the IED ended-up being a massive 800-page draft document. In June 2015, the final technical working group meeting for the finalisation of the BREF document took place in Seville. Since the beginning, we have provided data and technical information from real installations in order to try to correct the most vital inaccurate conclusions and I am glad that our efforts have paid off even if some uncertainties remain. It is never nice when assumptions have been made and that you are being perceived as "guilty until proven innocent". On the other hand, we have to learn from this process and be proactive in order to avoid a similar situation under the Medium Combustion Plant Directive which is currently in the drafting stage.

Looking forward to a continued high involvement by our member organisations in the coming months in order to have a fruitful and productive workshop in October.

ETN's Annual General Meeting and Workshop 2015

ETN held its Annual General Meeting (AGM) and Workshop on 21-22 April 2015 in Dublin, Ireland. During the event, over 85 participants joined to discuss ETN's activities over the past year and its vision for the future.

AGM

In its welcoming speech, Bernard Quoix, ETN Board President (Total) highlighted ETN's 10 year anniversary and stated that since its creation in 2005, ETN has accomplished a great amount of successes to become the solid association it is today. He also welcomed the 9 new members who joined ETN in 2014. ETN has now 103 members from 17 countries.

Key topics addressed during the event included ETN activities for 2014-2015, ETN finances and budget, EU energy and climate policies, the reviewing process of the Industrial Emissions Directive, ETN future strategy and activities, the Project Board Recommendation Report 2014 and many more. The AGM also welcomed Matthew Wittenstein from the International Energy Agency who gave an outlook on the energy market and Yrjö Komokallio from GASRE (GTUsers.com) who presented issues and requests from the user community. He also highlighted the opportunities for both oil & gas and power generation users to participate in independent user meetings on specific engines.

Workshop

On 22 April, ETN held a workshop which allowed the participants to get an overview of on-going projects and initiatives that were brought on the ETN platform. Leaders of the OMSoP project, the Exhaust Systems project and the Air Filtration project presented the progress made in the past year and their plans for the future. The Chair of each ETN's Technical Committees (TC) also presented the activities related to their TC and the new topics to be addressed in the future, which were later on discussed further in the individual TC sessions.

Proceedings

All presentations, pictures and the minutes of the AGM and Workshop have been uploaded on the ETN website (members' area) and are available exclusively to ETN members. For more information on ETN's AGM and Workshop or on ETN activities, please contact the ETN office.

We would like to thank PW Power Systems for hosting the Gala Dinner at Trinity College and all the participants for their valuable contributions. ■



Enabling high volumes of renewable power in the grid in a secure and reliable way

After ETN's Annual General Meeting in Dublin, ETN members had the opportunity to visit the Bord na Móna Power Plant located in Edenderry, Ireland.



BORD NA MÓNA 

Cushaling Power

Due to the intermittent nature of wind power, there is a need for flexible thermal units with fast response times to complement the increasing amount of wind capacity on the Irish electricity network.

Cushaling Power is a 116 MW peaking plant located adjacent to the Edenderry Power station. It consists of two open cycle gas turbine (OCGT) units that are fuelled by distillate oil. These units act primarily as reserve capacity on the grid, and are only expected to operate for a few hundred hours per annum. As Ireland installs more and more wind turbines, there will be an increasing need for fast-acting, flexible, gas turbine peaking plants.

The Cushaling Power units can start up and reach full power output in less than ten minutes. They can also provide the electricity system with a range of ancillary services that are necessary to ensure that the targeted level of intermittent renewable generation can be achieved safely. Cushaling is therefore ideally suited for the role of balancing and complementing wind generation. Following commissioning and testing during the summer of 2010, the Cushaling units entered commercial operation in September 2010 and provided a significant level of system support during the harsh winter of 2010/2011. The units have continued to support the safe and stable operation of the Irish grid ever since. ■

Bord na Móna has both a 128 MW base-load peat moss/wood chip biomass plant (Edenderry Power) and a 116 MW open cycle FT8 aero-derivative gas turbine plant (Cushaling Power). Ireland has a well-established Capacity Regime for the investment in such peaking plants which stabilise the grid. Bord na Móna's FT8 plant provides Emergency Black Start ancillary services to the grid operator, EIRGRID, to back up the metropolitan area of Dublin in case of grid failure.

The electricity market in Ireland has seen a major shift towards renewable energy provision over the past five years and is on track to meeting the 40% reduction of greenhouse gas emissions (GHGs) target by 2020. Bord na Móna is now a leading player in the sector and has made a major contribution to the achievement of this national policy objective as a result of biomass co-firing at EPL and the significant investment in wind energy.

Edenderry Power

Edenderry Power which is a 128 MW plant has been very successful in its Biomass Co-Fuelling program which commenced in 2008 and will reach 30% biomass by the end of 2015. This

program was assisted by establishing strategic partnerships with indigenous biomass suppliers.

With the Irish Government having set a 40% target to reduce GHGs by 2020, wind will also play an ever increasing role in electricity generation. The successful completion of the Mount Lucas and Bruckanna wind farms (120MW) in 2014 has made a significant contribution to this target. However, the power output from wind turbines is intermittent, varies with the wind strength and does not always match the demand profile. This means that flexible thermal units, with fast response times, will be needed to complement the increasing amount of wind capacity installed on the Irish network.

The Irish electricity system currently has a technical limit of 50% penetration of non-synchronous generation. The hope is that this limit will be raised to 75% by 2020 with the provision of additional ancillary services in support of this target. Bord na Móna is well placed to assist in the provision of these services with its existing portfolio of generating assets including the 116 MW aero derivative plant which has black start capability as well as synchronous condensing capability.

China-EU Solar Dish Workshop



Following the first Workshop held successfully in Xi'an, China on 14-15 November 2013, a Chinese delegation attended the Second Workshop organised by ETN and City University London on Concentrated Solar Power which took place in London on 3-4 June 2015. The Workshop welcomed the OMSoP consortium, the BioStirling-4ska consortium (EU-funded project on Stirling engine and CSP), the Dish-Stirling Solar Thermal Power Technology consortium (Chinese project on Stirling engine and CSP), representatives of European Commission and MOST

(Ministry of Science and Technology of China). The two technologies (MGT and Stirling engine) were evaluated according to the results achieved in the projects. The Chinese partners showed a higher interest in using MGTs for CSP rather than Stirling engines. A cooperation agreement was signed between the OMSoP and the Dish-Stirling Solar Thermal Power Technology consortiums with the objective to exchange technology developments information and market analysis.

The Workshop was hosted by City University London, the Coordinator of the OMSoP project (Optimised Microturbine Solar Power system) funded by the EU's 7th Framework Programme (FP7). ■



Member of the Year 2014

At the AGM in Dublin, Mohsen Assadi from University of Stavanger was awarded Member of the year for his active involvement in the Technical Committee 1: Low Carbon Gas Turbine Operations for his continuous effort in the Conference Advisory Board and for his valuable contributions to the H₂-IGCC project and several on-going ETN activities.

Other nominees were Pascal Decoussemaeker from Alstom for his active involvement in the Technical Committee 5: Asset Management as well as for his general support on several on-going ETN activities and Marc Van den Eynde from Camfil for his active involvement and for taking a leading role in the Air Filtration Project.

Congratulations! ■

New ETN members

With these new members, ETN has now 103 members from 17 countries.

- University of Nottingham (UK)



The University of Nottingham

UNITED KINGDOM • CHINA • MALAYSIA

- Sciemus (UK)

sciemus

- EUTurbines (Germany)



- National Instruments (Italy)



- Mitsubishi Hitachi Power Systems Europe (UK)



- Helmut Schmidt University (Germany)



**HELMUT SCHMIDT
UNIVERSITÄT**

Universität der Bundeswehr Hamburg

- Xenergy (The Netherlands)



GTUsers.com

End User Web portal for Oil & Gas and Power Generation

GTUsers.com is the official web service for the following Groups:

- Frame 6FA
- Frame 9FA/FB
- Frame 9E
- Frame 6B
- GT26
- GT13E2
- SGT5-4000F (V94.3A)
- SGT5-2000E (V94.2)
- LM6000
- RB211

Main features for each Group:

- Complete power plant data base
- Complete user data base
- Online discussion FORUM
- User conference page
- Other useful information pages

Statistics:

- Over 2500 end users
- Over 1000 turbines
- End users share experience on daily basis
- More than 50 logged in visitors daily

End User Web Portal:

GTUsers.com Web portal is tailor made for Turbine End Users (for both Oil & Gas and Power Generation Applications) in order to improve their sharing of experiences and to promote best technical solutions. GTUsers.com invites both Users from the **Oil & Gas** and the **Power Generation** sectors to join the web platform together with other End Users, in order to disseminate information and discuss further potential solutions.

End User web pages are accessible only by End Users belonging to a specific gas turbine group. We apply group policies created by the steering committees of each Group. Vendors or OEM's do not have access to end user pages.

GTUsers.com is powered by GASRE Oy and is **free of charge** for end users.

Welcome to Oil & Gas end users:

LM6000, LM2500 and RB211 series pages are waiting for end users and pages on other models will be created as requested.

Features:

- FORUM with SSL security
- User Data base with encrypted password handling
- Plant Data base
- Quality issues database
- Monthly summary of the discussion topics
- Feedback form for questionnaires (conference preparation)
- Conference registration forms (optional)

Security is a MUST:

We provide maximum site security to avoid any unauthorised access. To keep the access solely for end users, we apply a number of security steps of which a few are presented hereby:

- SSL-connection: Connection between User browser and our website is encrypted;
- Only company email addresses accepted, not public addresses like Hotmail;
- Password is encrypted;
- Our security manager performs regular audits.

Contact Us:

European Turbine Network
www.etn-gasturbine.eu

GASRE Oy, Finland
www.gasre.com
www.GTUsers.com

Upcoming End User Conferences

- **SGT5-4000F User Conference**
12-15 October 2015
- **Frame 6B&9E User Conference**
13-16 October 2015
- **RB211 User Meeting postponed**
More info on www.gtusers.com
- **GT26 User Conference**
12-16 October 2015
- **Frame 9FA/FB User Conference**
2-5 November 2015

Project News

EU-Project: OMSoP mid-term report



OMSOP is a research and development project co-funded by the 7th European Union's Research and Innovation Funding Programme (FP7) which aims at the development and demonstration of a parabolic solar dish system powering

a micro-gas turbine in the range of 3-10kWe. The project is coordinated by City University London and includes 8 partners from research and industry. It started on 1 February 2013 and will run for four years. A mid-term review was held in April 2015 and showed good progress towards targets in line with expectations. Abdunaser Sayma, Project Coordinator at City University London provides an overview of the project and summary of achievements.

Project vision, objectives and structure

The vision of the project is to develop and demonstrate a parabolic solar dish system powering a micro-gas turbine (MGT) in the range of 3-10kWe. The choice of the MGT as a prime mover was prompted by the need to find alternatives to Stirling engines due to their associated technical difficulties. In addition, the MGT offers a more direct route to hybridisation or coupling to thermal storage. The project also aims at performing research to develop an optimised system that can be subsequently taken forward to a higher than the Technology Readiness Level 5 (TRL) intended in this project.

To enable a successful demonstration, the project involves the development of a purpose built MGT derived from an existing system developed by one of the project partners, a suitable receiver and an improved concentrator.

Below is the list of the project partners and their respective main activities:

- **City University London** (City): City is the project coordinator and the partner responsible for the development, construction and testing of the MGT.
- **University of Roma Tre** (RO3): RO3 is responsible for the system optimisation and short term thermal storage. In addition they are participating in the cost analysis.
- **ENEA**: ENEA is responsible for the system integration, coordinating demonstration activities and life cycle analysis.
- **INNOVA Solar Energy SRL** (INNOVA): INNOVA is responsible for the design, optimisation manufacture, construction and operation of the dish.
- **Compower AB** (Compower): Is providing support to City for the MGT design in addition to providing the control system.
- **Kungliga Tekniska Högskolan** (KTH): KTH is responsible for the development of the solar receiver.
- **University of Seville** (US): Is responsible for the Market and cost analysis
- **European Turbine Network** (ETN): ETN is responsible for the publicity and dissemination activities.

Mid-term review and achievements

The mid-term review was held in Rome on 27-28 April 2015 and was hosted by ENEA. It was attended by representatives from all project partners and by the EU project officer (European Commission), Piero De Bonis and the external reviewer, Peter Breuhaas, IRIS. The first day involved technical discussions by project partners on the progress and plans for the remaining period and in the second day, delegates visited the already installed concentrator in Casaccia and presented work progress in the presence of the external reviewer. Below is a summary of progress:

Work package 1: System component development

This work package is concerned with the development of the three main components of the system (Concentrator, Receiver and MGT). INNOVA have completed the development of the demonstrator solar receiver with the tracking system. The receiver has been manufactured and installed at Casaccia and tests to characterise the DNI distribution at the focal point have commenced. A view of the solar dish is shown in Figure 1 below.



Figure 1: Concentrator installed in Casaccia

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KTH have commissioned their solar laboratory which will be used for testing prototypes of two receiver concepts that have been designed and analysed. One receiver has been sent for manufacturing. A view of the receiver is shown in Figure 2.

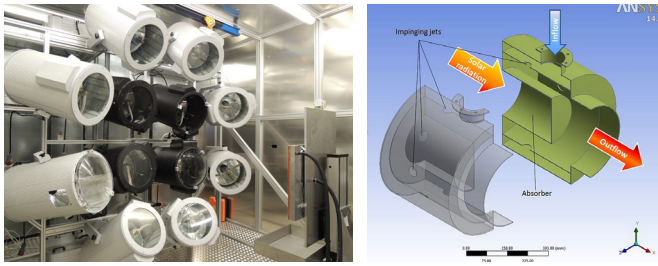


Figure 2: KTH solar lab and solar receiver concept

City University London, responsible for the MGT development, have designed an improved turbine, built and commissioned a test rig for turbine and compressor testing. A view of the rig is shown in Figure 3. They also have put forward a conceptual arrangement for the demonstration microturbine which is currently being finalised. University of Roma Tre has also been developing a tubular receiver with phase change materials for short-term thermal energy storage.

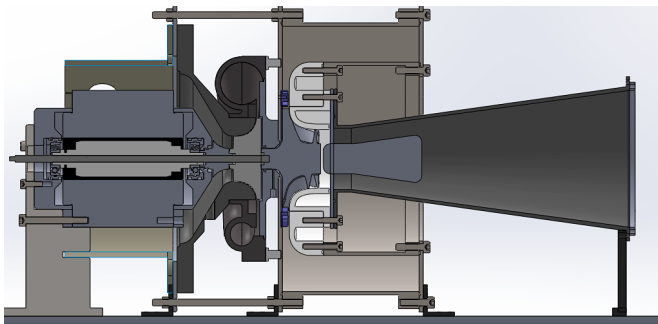


Figure 3: A section through the turbine and compressor test rig

Work Package 2: System design and integration

ENEA have been developing the process of system integration in collaboration with the system component development partners. Progress has been made on identifying the system control strategy and electronic equipment to couple the solar dish and micro-gas turbine controls and grid connections. The Civil Engineering work for the dish installation has been completed and the dish is installed as shown in Figure 1. The demonstration activity is scheduled to start in February 2016.

Work Package 3: Techno-economic analysis

University of Roma Tre has conducted a range of studies on optimised systems for future deployment with high electrical efficiency including new cycle configurations. They also have been studying the utilisation combination of cogeneration and regeneration.

University of Seville have produced a software able to perform generalised and detailed market analysis for solar dish systems worldwide. Work is underway on cost analysis of the system which is pending detailed costing of components.

For more information, visit www.omsop.eu.

Micro Gas Turbine (MGT) meeting organised by ETN

On 12 May, following the OMSoP dissemination meeting, MGT Original Equipment Manufacturers (OEM), Universities and R&D Institutes met at City University London to explore cooperation opportunities for MGT technology developments. More than 30 participants joined the meeting where the OEMs presented their technology and Universities presented their expertise and capabilities. Following to the presentations, a roundtable discussion took place in order to identify a roadmap for future cooperation activities. A follow-up meeting will be organised in October 2015. The presentations and the MGT expertise from Universities and R&D Institutes are available on the MGT project webpage on the ETN website available exclusively to ETN members (you need to be logged in on the ETN website to view the presentations).





EU News



EU Sustainable Energy Week 2015

This year, the European Union Sustainable Energy Week (EUSEW) took place on 15-19 June 2015, with a series of events and initiatives highlighting renewable energy and energy efficiency, including a high-level policy conference in Brussels with 4000 participants from more than 50 countries. Through-out the week, special events and activities across Brussels were held to attract attention to energy efficiency and sustainable energy themes. Events took place in over 40 different countries, with more than 150 events in Brussels alone.

The overall theme of the event was energy efficiency and renewable energy sources, while it also touched upon a variety of other European sustainable energy issues. ETN representatives attended sessions on EU climate change and energy policy, carbon capture and storage (CCS), energy efficiency and the integration of variable renewable energy into the grid.

Issues discussed that have an impact on ETN activities included the 2050 goal of an almost entirely decarbonised European power sector and the central role that CCS is foreseen to play in facilitating this.

Carbon Capture and Storage

The European Union's Energy Roadmap 2050 anticipates that carbon capture and storage (CCS) technology will play an



important role in decarbonising the European energy system from around 2030 onwards. However, so far progress towards this goal has been very slow. Installing 11 GW of CCS electricity generation in the EU by 2030, as envisaged by the EU Energy Roadmap, could cost between €18 and €35 billion. Current policies, including those foreseen by the 2030 framework for climate and energy and the emerging Energy Union, are unlikely to deliver this investment. New and stronger policy is required at the EU and Member State levels to accelerate the development and deployment of CCS over the next decade.

During the EUSEW, numerous speakers recognised that the European Union emissions trading system (EU ETS) alone will not provide a sufficient incentive to invest in CCS over the next decade and that complementary policies will be required.

On 16 June, the Grantham Research Institute on Climate Change and the Environment also launched a report on CCS in an event in Brussels: "Bridging the gap: improving the economic and policy framework for CCS in the European Union". The report clearly states that the EU requires stronger policies to incentivise CCS such as having mandatory targets on CCS in order to push the private sector to engage in the technology or introducing tailored incentives to support the intake of industrial CCS. It also calls for a more ambitious and coordinated action as only a small number of Member States has introduced policies to support CCS. To view the report on CCS, please [click here](#).

To view the official EUSEW 2015 website please [click here](#). ■

CAB elected for the 8th International Gas Turbine Conference Advisory Board 2016

During the AGM held on 21-22 April 2015 in Dublin Ireland, the members of the Conference Advisory Board (CAB) 2016 were nominated. They will work to set-up a successful IGTC-16, to be held in Brussels, Belgium in October 2016. The role of the CAB includes defining the overall theme of the conference, determining the topics of the call for papers and suggesting keynote speakers. The first meeting of the CAB will take place on 3 July 2015. ■

CAB member	Organisation
Catherine Goy	E.ON Technologies
Giovanni Cerri	University Roma TRE
Sonia Clarena Baron	EUTurbines
Chris Dagnall	DNV GL
Henk van den Berg	Xenergy
Abdulnaser Sayma	City University London
Yannis Harladupas	Imperial College
Stefan Geisse	Sciemus
Robert Steele	Electric Power Research institute (EPRI)

ETN welcomes its first insurance company, Sciemus within its membership



In April 2015, Sciemus became an ETN member and has then become the first insurance company to join ETN membership.

Stefan Geisse, Director of Power at Sciemus stated that *"the gas-fired power generation industry is currently in a very challenging phase, characterised by low profitability, price volatility and regulatory uncertainty. In light of this, risk management and cost control have never been more critical. Sciemus' membership to ETN will keep us updated on the latest developments, research and new technologies for gas turbines. Having access to the global gas turbine community will increase our understanding of the requirements, concerns and operational constraints affecting gas turbine users. All of these will enable us to better understand and respond to changes in risks brought about by operational and technological shifts in the industry."*

Who is Sciemus

Founded in 2002, Sciemus creates risk analysis models that quantify the behaviour of power generation assets and utilises the results to provide impartial information to the insurance and financial markets. They deliver these services

through their Power Risk Analysis Tool (PowerRAT), a proprietary risk analysis model designed to quantify the technical risk of operational thermal power generation plants. Their risk model takes an engineering approach by using normalised operational data, resulting into an analysis that moves away from experiential judgment to quantitative and fact-based insights. Over the past years, Sciemus has been approached by manufacturers and operators of gas turbines and other power generation components to gain advanced insight into their assets' behaviour. Sciemus has since then applied proprietary risks and data analytics combined with their modelling capability to support these enquiries.

All of Sciemus' risk models begin with big data. They have assembled a substantial database of gas turbine and power plant reliability history, which is continuously updated and maintained. Their analytics model analyse these data to provide strategic insights and "what if's" scenarios into gas turbine performance.

A prevalent concern among operators and OEMs is a change in the duty cycles of their gas turbine units, changing the operating regimes from base load to two-shifting or peaking. These changes are resulting in a demand for different levels of maintenance. Sciemus can predict the effect of these changes on the reliability of gas turbines. Another pressing issue is cost control through asset optimisation. Sciemus can analyse how extended maintenance intervals affect an asset. Additionally, they can quantify a power plant's risk exposure and the trade-off of transferring this risk through insurance or having strategic spares. ■

The two main ETN contacts at Sciemus are:

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Upcoming meetings and events

ETN Meeting/Event	Date	Location
ETN Board Meeting*	1 July 2015	Brussels, Belgium
Conference Advisory Board Meeting*	3 July 2015	Teleconference call
ASME ORC Power Systems Conference 2015	12-14 October 2015	Brussels, Belgium
SGT5-4000F User Conference (<i>organised by GTUsers.com</i>)	12-15 October 2015	Berlin, Germany
GE Frame 6B, 7E & 9E User Conference (<i>organised by DGTA</i>)	13-16 October 2015	The Hague, The Netherlands
IAGT 2015 Symposium	19-21 October 2015	Banff, Canada
ETN October Workshop*	21-22 October 2015	Madrid, Spain
7 th EVI-GTI International Gas Turbine Instrumentation Conference	3-5 November 2015	London, UK
International Gas Turbine Congress - GTSJ (ETN members are entitled to a special discount)	15-20 November 2015	Tokyo, Japan
ETN Project Board and TC Chairs Meeting*	26-27 November 2015	Brussels, Belgium

* Event open exclusively to ETN members

Latest developments on the Industrial Emissions Directive

The Final Technical Working Group (TWG) meeting for the review of the Large Combustion Plant (LCP) Best Available Techniques Reference Document (BREF) took place from 1-9 June in Seville, Spain. Two representatives from ETN's IED Committee joined the meeting in Seville on behalf of ETN: Tomas Alvarez from Endesa and Neil Dawson from National Grid.

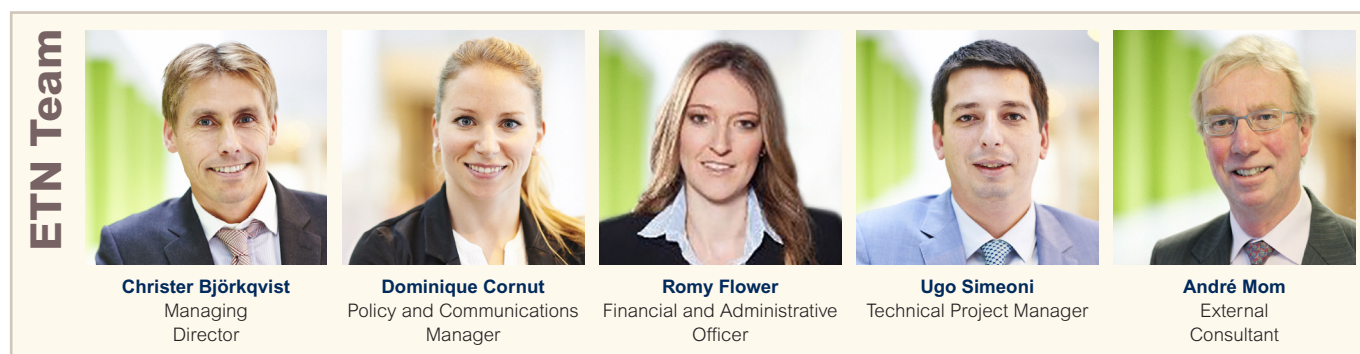
The discussions focused on the technical aspects of BAT and more than 50 BAT conclusions and 300 BAT-AELs were discussed and agreed on. However, there are a few issues that were not completed during the final meeting. In order to address these, the European Integrated Pollution Prevention and Control Bureau (EIPPCB) will organise a Webinar early in July for a number of topics which require interactive discussions between TWG members. For the remaining outstanding topics, the EIPPCB will organise a written consultation asking for the TWG members' feedback by 31 July 2015.

As a result, there are still some critical issues that are not fully

defined and still some uncertainties. ETN will participate in the webinar and continue to seek for further clarifications. The ETN IED Committee has therefore decided to postpone the publishing of the final outcome report until these have been clarified and will keep its members informed on the latest developments. As there are quite a number of targets left at indicative level the Member States' competent authorities will play a very important role in the eventual interpretations and implementations of BAT-AELs. For more information, please visit the IED Committee webpage on the ETN website.

Acknowledgments

ETN would like to warmly thank all IED Committee members that have actively contributed and especially ETN's Committee Chair, Roger Brandwood (E.ON Technologies) and Tomas Alvarez (Endesa), Neil Dawson (National Grid) and Swift Tarbell (PWPS) for their valuable contribution and active involvement in the reviewing process of the LCP BREF document. ■



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