

ETN is a non-profit association bringing together the entire value chain of the gas turbine technology community globally. Through cooperative efforts and by initiating common activities and projects, ETN optimises turbomachinery research and technology development and promotes environmentally sound gas turbine technology with reliable and low cost operation.

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Christer Björkqvist
Managing Director

Welcoming the new Board of ETN

It is important from time to time to take a step back from our daily work to find new energy and motivation. I am not talking about taking a vacation but looking at the bigger picture, finding new ways and solutions to address our problems. New knowledge, experiences, contacts or different viewpoints are all important ingredients to find the optimal way to make important steps towards goals. I believe that these are all key benefits offered when attending ETN meetings, parallel to development of new initiatives that can further benefit our community. I hope that our recent Annual General Meeting and Workshop served as fuel and inspiration for our attending members. This year we had our biennial Board election, and I would

like to welcome the newly elected Board. Bernard Quoix, who was re-elected as President of ETN, stated that we have to embrace the transition trend to a low-carbon society and be at the forefront of this change to enable environmentally sound turbomachinery technology with reliable and low cost operation throughout the energy transition. Bringing cooperation to a new level is a key driver to reach the goals in the adopted strategy of ETN. This will be an important task of the newly elected Board.

In the recently published report by the International Energy Agency on the Global Energy and CO₂ Status, the tremendous challenge in meeting the goals of the Paris Agreement is clearly highlighted, as it reports a growth of the global energy demand by 2.1% in 2017 and an increase in CO₂ emissions by 1.4%. Within ETN we are discussing and exploring further developments and new concepts to increase the contribution to these goals and eventually enable CO₂ neutral operations for the User communities. Hydrogen and Carbon Capture and Storage solutions both are contenders to play a high importance in the development of a carbon neutral energy system but both face political and technical challenges to be solved. Today, with the very low price of carbon in the EU, many solutions are simply too expensive. It will be interesting to see the effect the revision of the EU Emissions Trading System (EU ETS) for its next phase (2021-2030), recently approved by the European Council, will have on the carbon price. The objective is to substantially increase the carbon price and make the EU ETS truly effective of achieving the EU's emission targets by 2030.

At our Annual General Meeting, an interesting carbon neutral solution was presented and discussed involving both hydrogen and CCS by Vattenfall in their joint project with Statoil to convert one of the Magnum power plants three 440-megawatt CCGTs in Emshaven, Netherlands, to run on hydrogen by 2023. The plan is to convert natural gas sourced from Norway into hydrogen and carbon dioxide. The hydrogen will be used in the Magnum plant, and the carbon dioxide will be transported by a pipeline and stored in underground facilities of the Norwegian coast, allowing carbon neutral production.

Looking ahead, we have two upcoming Engine Specific User meetings: The SGT-A35 (RB211) on 26-27 of April and LM2500 on 20-21 of June, where I hope to see a wide participation of the owners and operators of these engines along with the OEMs and service providers. In between there are two conferences that ETN provides support to and where our Members get preferential participation and expo fees. The first one is NexTurbine, 23-25 May in Jiangsu, China, and shortly after, 11-15 June, the ASME Turbo Expo will take place in Oslo, where ETN will be involved in a number of sessions as well as be present with a stand.

ETN's 14th Annual General Meeting

ETN Annual General Meeting and Workshop were held on 14-15 March 2018 in Bucharest, Romania, hosted by our member COMOTI. In total 69 member representatives attended the meetings that took place at Athénée Palace Hilton hotel and Polytechnic University of Bucharest.



In the morning of 14 March, while the ETN Board held a short meeting and the Air Filtration Working Group made progress on the ISO standard development, COMOTI had arranged a site visit to their facilities for the rest of the ETN members, before the official start of the Annual General Meeting (AGM). In the AGM opening session, Bernard Quoix, ETN President (TOTAL) welcomed the 12 new members who had joined the network since the last AGM in May 2017, and highlighted the steps to be taken to continue and further benefit of this positive growth of ETN. Christer Björkqvist, ETN Managing Director presented ETN's activities of the past year, followed by a short introduction of the ETN's new website given by Noora Kilpinen, ETN. ETN Project Board Chair Peter Jansohn (PSI) and the Chairpersons of ETN's Technical Committees (TCs) provided the participants with an overview of ongoing projects and introduced the initiatives to be discussed during the TC sessions on the second day. Prior to the Board election participants were given an overview of the proposed

ETN strategy by the Board member Gary Lock (Frazer-Nash Consultancy), while Herwart Hönen, ETN Treasurer (RWTH Aachen University) presented a sound financial report. Before discharging the Board of Directors 2016-2018, Christer Björkqvist dedicated a special greeting to Herwart Hönen (RWTH Aachen University) and Giovanni Cerri (University Roma TRE) and thanked for their time and support as Members of the ETN Board since the launch of ETN in 2005, as they enter into retirement at the end of this year. The new Board of Directors was introduced to the General Assembly in the closing session of the AGM (see the next page). Geert Laagland (Vattenfall) also introduced the interesting Hydrogen to Magnum project.

On the second day, COMOTI President and General Manager Valentin Silvestru welcomed the participants to the Workshop and introduced COMOTI's organisation and research activities. This was followed by the Best Practice Award presentation by Pascal Decoussemaeker (GE Power), who introduced all the en-

tries submitted to this new ETN award that was launched last year together with the Combined Cycle Journal. The Best Practice Award prize in the "Workforce Development/Knowledge Management" category was given to ExxonMobil for their multi-step approach for improving engine performance fleet-wide. The winner of the "Environment, Health and Safety" category was GE, who received the prize for their sound approach for ensuring safety site-wide. After the award announcements, the Workshop continued with presentations given by Simon Balmer (Uniper), Alessio Miliani (BHGE) and Giacomo Tirone (Enel), followed by ETN Technical Committee meetings. Outcomes of these meetings, such as the follow-up plans with Additive Manufacturing initiative, Hot Corrosion Working Group, ETN-US-UK collaboration programme, Ammonia Interest Group and monitoring of gas quality standards were highlighted in the closing session of the Workshop. The AGM Summary report, presentations and meeting minutes are available for our members on the [ETN website](#). ■



New ETN Board of Directors for 2018-2020

At this year's Annual General Meeting, the new ETN Board of Directors for 2018-2020 was elected by the General Assembly.

The ETN Board is responsible for preparing and presenting the strategy of ETN to the General Assembly, and for ensuring an efficient and sound management of the Association in line with the strategy and goals adopted by the General Assembly. The Board is elected at the AGM every two years and has four meetings per year. We would like to congratulate the elected Board members on their position, and warmly

welcome the new Board members Manfred Aigner (DLR - German Aerospace Center), Mick Conway (RWG Repair & Overhauls), John Oakey (Cranfield University), Aristide Massardo (University of Genoa) and Bram Van Cauwenberge (ENGIE). The newly elected Board's first assignment will be to nominate the new Project Board at the end of April. ■



Member of the Year: Olaf Brekke, Statoil

During the AGM dinner on 14 March 2018, Olaf Brekke (Statoil) was awarded Member of the Year 2018 for his reliable and valuable support to the User Group initiatives, the Air Filtration Working Group, and his continuous commitment to ETN. The two other nominees were Pascal Decoussemaeker (GE Power) for his active involvement in TC4&5 and for his involvement and efforts related to the launch of the Best Practice Award, and Rob Bastiaans (Eindhoven University of Technology) for his active participation in the TC2, his involvement in the IGTC-18 Conference Advisory Board and especially for setting up the Ammonia Interest Group. ■



"I strongly believe that a very active collaboration between the Academia and Industry is a driving force for building a stronger community in the field of gas turbines and their applications. Therefore, as a newly elected ETN Board member, I look forward to promoting and strengthening cooperation within ETN and the whole turbomachinery community."

Aristide Massardo,

Full Professor of Energy Systems and Dean of
Polytechnic School of Engineering and Architecture,
University of Genoa

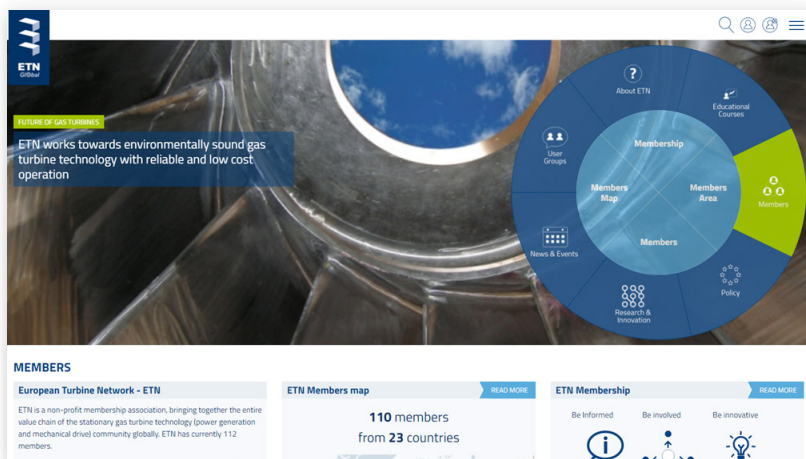
New member: AST Turbo



ETN welcomes AST Turbo from Switzerland, who joined the network in February 2018. AST Turbo is an independent service provider for rotating equipment with experts in all aspects of turbomachinery service. ■

ETN's new website

We are pleased to announce the launch of our brand new website www.etn.global! New elements include for example a responsive design, possibility to register for our events directly on the website, and a section dedicated to educational courses, where ETN is collecting a list of available gas turbine courses worldwide. All the content from the old website is also available on the new website, and some sections still remain visible only for our members. ETN office sent a new username and password to all the member representatives on our mailing list. If you are an ETN member and have not yet received your login credentials, please send an email to info@etn.global. Please note that due



to a domain name change, also all our email addresses have now changed from @etn-gasturbine.eu to @etn.global. ■

This year's User Group meetings are approaching

As a User-driven organisation, ETN's annual User Group meetings are an essential part of our association's activities. Within the framework of the User Groups, the most critical technical issues have separately been collected from the two user communities of the engines; SGT-A35 (Siemens) and LM2500 (BHGE) during the preparation period for these events. The issues were then reviewed and prioritised by the User Groups' Steering Committees, who met on 31 January 2018 in Florence, Italy. The selected issues will be discussed in the forthcoming SGT-A35 and LM2500 User Group meetings.



This year's first event is the SGT-A35 User Group meeting, which will be held on 26-27 April 2018 in Sitges, Spain, at Hotel Estela Barcelona. All SGT-A35 operators are invited to participate in the meeting; for more information, please visit the [event webpage](#).



The LM2500 User Group meeting will take place on 20-21 June 2018 in Berlin, Germany, at Radisson Blu Hotel. A draft agenda and more information of the event is accessible on the [ETN website](#). Registrations for this event will also be open in the following weeks. ■

ASME Turbo Expo 2018 in Norway

ASME Turbo Expo will take place on 11-15 June 2018 in Lillestrøm (Oslo), Norway. Christer Björkqvist, ETN, together with Robert Steele from EPRI, will co-chair an Electric Power Committee Panel Session "Combined Cycle Gas Turbine Asset Management: A Utility Industry Worldwide Perspective". ETN will also be present in the ASME Turbo exhibition area on 12-14 June 2018. As every year, ETN members are entitled to a discounted registration and exhibition fees for the event. To receive the discount, ETN members should access the [ASME registration page](#) and choose ETN as a "Reciprocating organisation" while completing the registration. ETN has selected also other high-level conferences and established cooperation with them, providing discounted registration and exhibition fees for our members – see the last page for more information. ■



ASME 2018 TURBO EXPO

Turbomachinery Technical Conference & Exposition
Presented by the ASME International Gas Turbine Institute

IGTC-18: save the date!



The 9th International Gas Turbine Conference (IGTC-18) – "The Future of Gas Turbine Technology" will take place on 10-11 October 2018 at Le Plaza Hotel in Brussels, Belgium. After closing the Call for Papers, the Conference Advisory Board of the IGTC-18, with the help of Paper Reviewers, completed two rounds of technical paper abstract reviews. The authors of selected abstracts have been invited to submit a full technical paper for the conference by 29 April 2018. This year's already confirmed keynote speakers include Mechthild Wörtsdörfer, European Commission's Directorate General for Energy; Richard A. Dennis, U.S. Department of Energy, and Nils A. Røkke, SINTEF. A more complete programme for the conference will be available in June on the [IGTC-18 webpage](#), together with an access to the registration platform. More information coming up in our next newsletter! ■

INTERVIEW

The **RENESENG** project

ETN interviewed Panagiotis Grammelis from CERTH – Centre for Research and Technology Hellas, who is a consortium member of the EU funded RENESENG project. The project started in November 2013, and its consortium consists of 15 partners around Europe, including ETN members CERTH (Greece), Imperial College London (United Kingdom) and Delft University of Technology (the Netherlands).



Can you tell us about the background of the project?

The Renewable Systems Engineering grant (RENESENG) is an FP7 Marie Curie project that researches and trains a new breed of engineers with project experience in biorefineries and emphasis on advanced process design, synthesis, model-based screening and analysis and process integration. RENESENG continues and builds on a series of successful EU and national projects and training future scientists and engineers in biorefinery related topics.



Project details:

Start date: 1 November 2013
End date: 31 March 2018
Total cost: 4 195 076,17 euros
Coordinated in: Greece

engineering, biology and biotechnology, computer science, process engineering, logistics and business economics, as well as social sciences, with an emphasis on life cycle analysis skills.

Do you have any follow-up plans once the project has now come to an end?

A strong network of partners has already been created through the implementation of RENESENG project activities. Taking into consideration the new calls under the European Commission's Horizon 2020 programme, the consortium will decide on the next steps. ■

What does make the project unique?

The project addresses different topics on biorefineries' sectors: lignin-based and cellulosic processes, water-based paths to biomass production, waste treatment paths, hybrids of bio-based renewables with other forms of renewables.

What is the link between the RENESENG project and gas turbines?

The project's main objectives are clearly in line with ETN's aims to foster international cooperation in the industrial sector of turbines, as well as to promote the utilisation of the final products of biorefineries (e.g. syngas).

Why is the project relevant in the context of the EU's 2030 climate and energy targets and 2050 low-carbon economy roadmap?

The project is relevant to EU 2030 targets and 2050 roadmap, as it promotes the utilisation of biomass for energy production through different processes, such as combustion, gasification and pyrolysis. Moreover, the project promotes the development of biorefineries and eco-industries in general.

What are the main results of the RENESENG project?

RENESENG brought together interdisciplinary academic and industrial teams of high-quality expertise, embracing disciplines in agricultural sciences, chemistry and chemical

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ETN members are entitled to a 10% discount for the registration fee



EU 2050 Climate Strategy

The EU leaders are urging the European Commission to speed up with its 2050 climate strategy. Last month, the [Euro-
pean Council](#) asked the Commission to present in the beginning of 2019 a proposal for a “Strategy for long-term EU greenhouse gas emissions reduction in accordance with the Paris Agreement, taking into account the national plans.” Miguel Arias Cañete, Commissioner for Climate Action and Energy greeted the demand and announced on Twitter that the Commission “will deliver”. The current [2050 low-carbon economy road-map](#), drafted in 2011, suggests that by the year 2050, the EU should cut its emissions to 80% below 1990 levels, but in line with the Paris Agreement the Commission will need to update those figures to correspond the international agreements the EU has committed to. ■

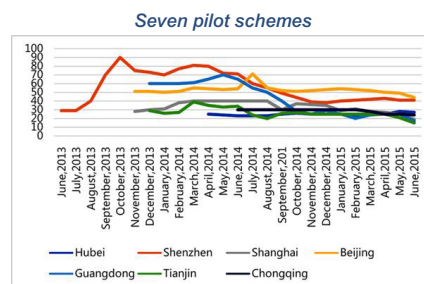
EU Emissions Trading System reform

After the European Parliament’s approval earlier in February, the Council of the EU agreed on the [reform of the EU emissions trading system](#) (ETS) for 2021-2030. ETS, highlighted as a cornerstone of the EU’s policy to battle climate change, aims to cut the greenhouse gas emissions in line with the EU’s Paris Agreement commitments. In the updated directive, the cap on the total volume of emissions (linear reduction factor) will be reduced annually by 2.2%. The reform will also double the

number of allowances to be placed in the market stability reserve until the end of 2023 and limit the validity of allowances. It also includes new provisions to protect industry against the risk of carbon leakage and the risk of application of a cross-sectoral correction factor. The trading scheme is the biggest in the world, limiting over 11.000 power stations and industrial plants. The approval of the Council was the final step of the legislative process before the directive entering into force. ■

Chinese National Trading Scheme

Carbon markets have failed to live up to their potential so far, but as a result of widely signed Paris Agreement, they are likely to be far more important in the coming decades. China announced in December 2017 that it will introduce a National Emissions Trading Scheme for carbon dioxide in 2018 based on the experience of seven pilot schemes, which have been operating in cities and provinces that reflect the diversity of conditions in China. The potential impact of a more market-oriented climate policy in the world’s largest greenhouse gas emitting country is enormous. But it will be a gradual start with an electricity-only scheme before expanding to other industries, and many big obstacles need to be overcome for the scheme to become an effective part of China’s climate policy portfolio. China’s new national Emissions Trading Scheme has been analysed in-



depth by a team of researchers led by Professor Frank Jotzo from The Australian National University (ANU). Professor Jotzo, Director of the ANU Centre for Climate Economics and Policy, said China’s Emissions Trading Scheme will need to evolve over time to be successful, but it could help China eventually take the lead in the global carbon market. The article by Professor Jotzo and colleagues from universities in China, Germany, United Kingdom and United States is published in the journal Nature Climate Change. The full paper is available via [this link](#). ■

Clean Energy Package

In November 2016, the European Commission introduced the Clean Energy Package and the eight legislative proposals as part of it, which cover the areas of energy efficiency, renewables, electricity markets and governance. The final stage of the negotiations has now been reached: the so-called “trilogue” negotiations on the Clean Energy Package between the European Parliament, Council and Commission started in February 2018. The negotiations are expected to be difficult, as for instance the Parliament’s 2030 target of 35% for renewable energy seems to be too ambitious for some Central and Eastern European countries that still heavily rely on coal. ■

OECD says energy taxation should be more effective

OECD calls the governments for making better use of energy taxation to address climate change. According to the "[Taxing Energy Use 2018](#)" report, which describes energy taxation in 42 OECD and G20 countries between 2012 and 2015, taxes on energy use could reduce excessive emissions in the sector. The report shows that apart from road transport, 81% of emissions were untaxed in 2015, and that taxes on coal often

equal zero or remain untaxed in almost all countries the report covers. "Efforts have been made, or are underway, in several jurisdictions to apply the 'polluter-pays' principle, but on the whole progress towards the more effective use of taxes to cut harmful emissions is slow and piecemeal. Governments should do more and better," said OECD Secretary-General Angel Gurría in a statement. ■

IEA reports on rising CO₂ emissions

According to the International Energy Agency's "[Global Energy and CO₂ Status Report](#)" for 2017, published last month, the energy-related CO₂ emissions rose up by 1.4% in 2017, resulting to a record-high 32.5 gigatonnes. The overall global energy de-

mand was reported to grow by 2.1% in the past year. The IEA report shows also a 3% growth of natural gas demand globally, most of the growth (80%) coming from industry and buildings. ■

Successor for Horizon 2020

The European Commission is currently preparing its next framework programme for research and innovation (FP9) that will follow the Horizon 2020 funding programme. Jean-Eric Paquet, the newly appointed Director-General of DG Research and Innovation, revealed in [an interview](#) that the options for the FP9 budget are 80, 120 or 160 billion euros. The Commission is expected to present its EU budget proposal for 2021-2028 in May 2018, followed by a proposal for the next framework programme for research and innovation. The new research programme is set to be launched on 1 January 2021. ■

SET-Plan Action 6: Workshop on Energy Efficiency in Industry



The Strategic Energy Technology Plan (SET-Plan) Working Group 6 on Energy Efficiency in Industry will organise a [workshop](#) "*Making EU industry more energy efficient and more competitive*" on 27-28 June 2018 in Brussels. The objective of this workshop is to contribute to the realisation of the Implementation Plan: en-

hancing cooperation between National programmes and further developing the activities into concrete projects.

The workshop is open to SET-Plan country representatives of National and Regional Ministries or Funding Agencies, funding research and innovation in the field of energy and resource efficiency in industry, and Stakeholder representatives from industry, research institutions and academia of the same field. Stakeholders are also invited to submit their project ideas for the workshop. [Registrations and the call for project ideas](#) are open until the end of April. For ETN members planning to submit a project idea: please contact Ugo Simeoni, ETN: us@etn.global ■

Upcoming meetings and events

Meeting/Event	Date	Location
SGT-A35 (Industrial RB211) User Group meeting	26-27 April 2018	Sitges (Barcelona), Spain
NexTurbine2018*	23-25 May 2018	Jiangsu (Shanghai), China
EU Sustainable Energy Week (EUSEW)	4-8 June 2018	Brussels, Belgium
ASME Turbo Expo*	11-15 June 2018	Lillestrøm (Oslo), Norway
Electrify Europe*	19-21 June 2018	Vienna, Austria
LM2500 User Group meeting	20-21 June 2018	Berlin, Germany
Middle East Rotating Machinery Technology and Innovation Conference*	25-27 September 2018	Dubai, United Arab Emirates
ETN High Level User meeting**	9 October 2018	Brussels, Belgium
International Gas Turbine Conference 2018	10-11 October 2018	Brussels, Belgium

* ETN members are entitled to a discounted registration fee | ** Only for ETN members

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ETN at a Glance!

Download the [ETN Brochure](#), featuring:

- ETN Mission & Objectives
- ETN Technical Committees
- ETN Projects
- ETN Events & Activities
- ETN Membership Benefits
- And more!



Are you a gas turbine user located outside the EU? [Download the Brochure](#) showcasing the benefits of being part of ETN's global gas turbine user community.



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