ETN NEWS

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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.

In this issue

Christer Björkqvist
Managing Director

Digital opportunities and challenges for our industry

Digitalization has become buzzwords that you find on many front pages these days. But what does this revolution really mean to our industry and how should we position ourselves to best benefit of it without increasing the risks?

For years, the gas turbine user community have asked for increased reliability, reduced outage time and reduced operational cost. Today, the major OEMs that have invested heavily in coupling Operational Technologies with Information Technologies in digital platforms state that they have the solution in place to make this happen.

It is clear that data collection and integration together with advanced analytics and diagnostics open the door to better decisions and major cost reductions in operating expenditures but there are also challenges and risks associated with replacing human experience with analytics, especially in our industry where the stakes are so high. When we embark on this transformation it is vital to ensure that we collect and analyse the right data as each application are very site specific. Another question is also if the user community is prepared to give up the ownership of their data and to use the platforms developed by the OEMs rather than their own.

3D printing is also a hot topic related to digitalization with accelerating developments that opens up for many new opportunities. From a design point of view but also from a cost cutting perspective when it comes to manufacturing, repairs and logistics, new openings appear. However, it is important that the quality and safety aspect are not being ignored when we are faced with these tempting transformation opportunities.

All of these are important topics to be discussed and debated at our forthcoming Annual General Meeting (AGM) in May alongside exploration of Research & Innovation opportunities in the energy transition towards a low-carbon society.

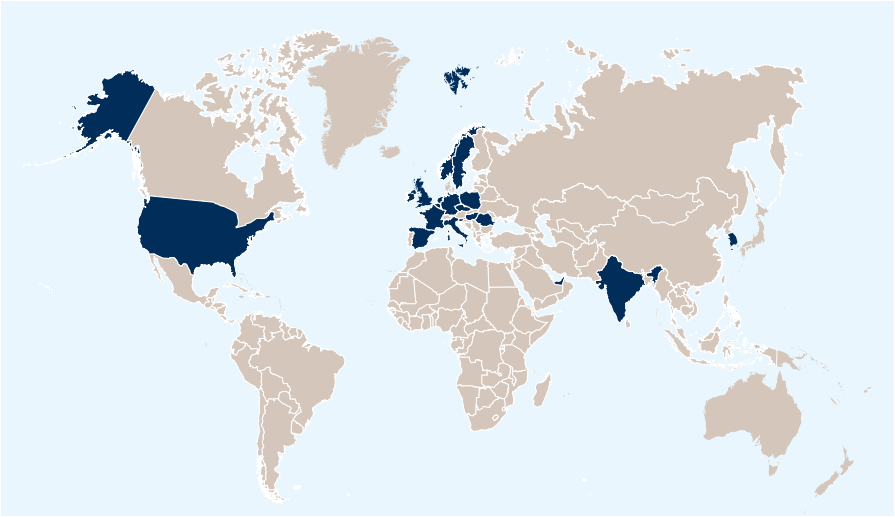
Apart from our forthcoming AGM, we also have a number of independent engine-specific user meetings coming up in May and June. These are meetings dedicated to selected, frequently-used gas turbine engines for both the power generation and oil & gas sector that ETN arranges in partnership with GTUsers.com. The objective is to exchange experiences, best practises and to trigger dedicated responses from the specific OEM of that engine, addressing the prioritised needs and requirements of the user community, but also to bring more generic issues to ISPs and the R&D community.

The Industrial RB211 User Group Meeting will take place on 3-4 May 2017 in Milan and the LM2500 User Group Meeting will take place 14-15 June 2017 in Brussels. Registrations to both events are now open.

Finally, I am pleased to announce that the modification of ETN's Articles of Association proposed by the Board has been approved unanimously by our General Assembly. This vote has secured the rights of our British members, opened the door to global members and simplified the functioning of the organisation. It expresses a clear and strong support to the strategy developed by the Board to prepare our organisation for current and future challenges that the gas turbine community faces. This strategy has already attracted additional members that will strengthen ETN further. I am delighted to welcome and introduce, in this newsletter, our latest new ETN Members: ADNOC, United Arab Emirates; Svenska Kraftnät Gasturbiner (SKG), Sweden; Lafage Energy, France; Rolls Wood Group (RWG), UK; and United Service Sweden.

A global network prepared for the challenges

The general landscape of the gas turbine technology and community has changed rather drastically during the past years due to a globalisation of our business where we have seen a stagnating market in the developed countries and a fast growing market in developing countries. Other contributing factors have been the result of globalised natural gas market, common climate actions agreements, a renewable energy revolution and the start of a digitalisation of our industry. ETN is preparing itself for those changes and opportunities by opening up for a more global integration and cooperation to the benefit of all our members.



ETN members throughout the world

ETN was created 12 years ago with the determination to bring together the whole community of gas turbine technology on one platform, aiming at openly discussing and addressing common issues, sharing experience, and valuing good practices. This has not changed and is still the main reason for its existence. Yet, the general context has deeply changed since: the markets have considerably widened and become globally interconnected, policy frameworks and priorities have evolved, heading to a low-carbon economy with a curb of emissions and increasing shares of RES. Consequently, the challenge of advocating the GT technology has become more urging and the necessity to pursue research and innovation efforts is growingly strategic to maintain the relevance of GT.

Adapting to the present and future challenges

As the markets are becoming more global and interconnected, we have to ensure our sectors' competitiveness through an increased cooperation. A major conclusion at our International Gas turbine conference in October 2016 was the necessity to take collaboration to a new level in order to reach our ultimate goal: to enhance the developments, which can deliver a flexible, environmentally-sound gas turbine technology with reliable and low-cost operation, also in future low-carbon scenarios beyond 2030. Based on a proposal from the ETN Board, ETN members decided in February to widen geographically the scope of ETN's European Membership as well as to allow members from other continents to join as Global Members. The response has been immediately positive (see "Inside the network", page 3). This has also secured the continued rights of ETN's British members in spite of Brexit. ETN has now proposed to its members to complete this process of opening up and reinforcing the cohesion by widening its scope to turbomachinery. This would benefit the entire network, allowing the coverage of a more comprehensive range of operational topics with synergies to the core business of gas turbine technology. Steam turbines, compressors and generators already form a major part of the rotating equipment of either a CCGT plant or Oil & Gas and LNG facilities. Integrating these additional technologies within ETN would ensure continued growth of the network and enhanced value to its members. This topic is on the agenda of the forthcoming Annual General Meeting, which will take place on 10 May 2017 in Oberhausen with the support of our sponsors MAN Diesel & Turbo and Lufthansa Group. It will be followed by a workshop on the 11 May, giving the Technical Committees the opportunity to take stock on the advancement of their projects.

The AGM is open to members of ETN only. Registration and more information are available on ETN website (you need to be logged in for access). ■

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ETN welcomes 4 new members!

Since January 2017, ETN has welcomed no less than 4 new members, proving its dynamism and fostering the relevance of its recent move to open up globally. Lafage Energy (France), RWG (UK), Svenska Kraftnät Gasturbiner-SKG (Sweden) and United Service Sweden have joined ETN in the last weeks. *"This expansion is a positive sign for our network of course, but it is also a sign of the growing cohesion of the Gas Turbine User community"*, the President of ETN Bernard Quoix underlined. ■

SVENSKA KRAFTNÄT GASTURBINER AB

■ **SKG:** Gas turbine user, Sweden

RWG REPAIR & OVERHAUL EXPERTISE

■ **RWG:** Service Provider, UK

U$$ UNITED SERVICES SWEDEN AB
Anti Fouling Solutions

■ **United Service Sweden:** Service provider, Sweden

LAFAGE ENERGIE

■ **Lafage Energy:** Consultancy, France

They are on Linkedin:
RWG
SKG

ETN opens up to global members

In February, the members of ETN have unanimously decided to give their support to a proposition of the Board that opens up the network globally. This change in the status of ETN now allows users (utilities and oil and gas) and original equipment manufacturers (OEMs) to join the organisation with extended rights compared with the previous categories of affiliate and associated categories. This move is a milestone in the story of our organisation and it has already had positive outcomes: since the new status has come into force, 3 new members have joined in the Global member category: KEPCO (South Korea), ExxonMobil (USA) and ADNOC (United Arab Emirates) and more companies have expressed their interest. The decision to modify the status has also widened the European category to a geographical understanding, beyond the membership of the origin country to the European Economic Area (EU + Iceland, Liechtenstein and Norway). This will allow British members to retain the full extent of their rights, even after Brexit is complete. ■

They are on Twitter:
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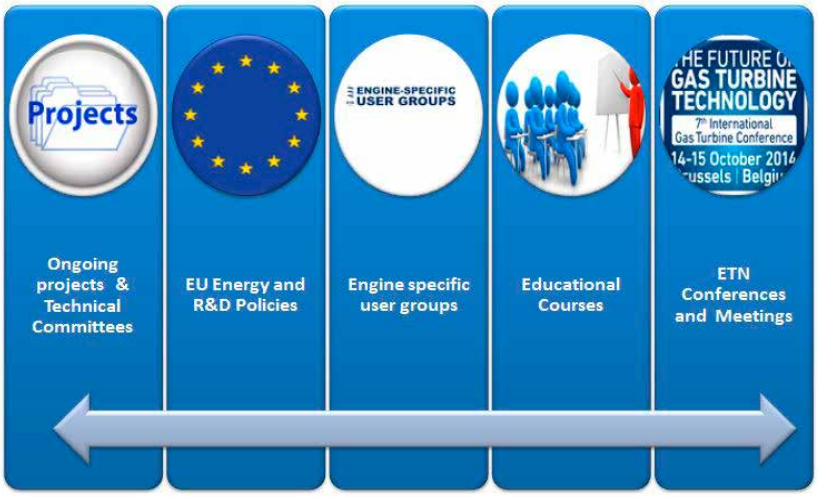
@ExxonMobil
@ADNOCGroup

A new pillar: educational courses

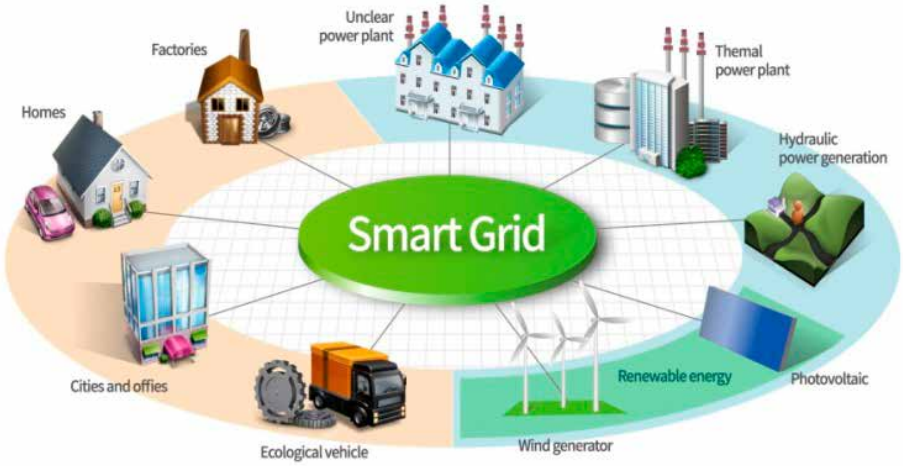
With 105 members across 20 countries, ETN is rich of exceptional experience and expertise, and this is what the organisation is willing to harness as it will launch a new programme based on a series of tailor-made educational courses and workshops for different markets. Such programmes would be addressed specifically to user communities from non-European markets over a period of 2.5 years, with two sessions per year, each lasting between 3 and 4 days. A visit to European member facilities would be offered as a conclusion of the course. The curriculum would be devised with the help of experts from members of ETN. ■

ETN Pillars



Micro Gas Turbines: a promising technology for the future

The Micro Gas Turbine (MGT) technology could provide important contributions in the energy transition to a low-carbon economy. This issue of ETN's Quarterly newsletter takes stock on the new developments and initiatives that enlighten the relevance of MGTs today and in the future.



Micro turbine in the Energy System

Last week in Brussels, ETN organised a meeting with all the stakeholders of its working group (WG) dedicated to Micro Gas Turbines (MGT), in order to discuss a strategy for the deployment of this technology in the new EU energy scenario. In May, City, University of London (member of ETN) also organises a symposium addressing the areas of potential application and the measures to reduce costs enabling a market deployment. Finally, later this year, the OMSoP project is set to demonstrate its optimised microturbine solar power system. ETN and 5 of its members are part of this project (City, University of London; ENEA; KTH – Royal Institute of Technology; Roma Tre University and University of Seville).

OMSoP system

MGT is an interesting and promising technology to produce high density distributed power for micro systems or micro grids. Due to its flexibility from both operational and fuel perspectives it can provide strategic important contributions to reduce emissions in line with the EU 2030 Climate and Energy targets as well as to facilitate the integration of renewables into the power grid. To highlight the potentialities of MGTs, the ETN WG has prepared a Technology Summary presenting its features and challenges, the expected impacts, the policy framework and requirements for deployment. ETN has also successfully been pushing for the integration of MGTs in the Strategic Energy Technology Plan (SET-Plan) carried by the EU:

- A representative of the ETN MGT WG was appointed in the Biomass panel of the Renewable heating and cooling ETIP;
- "Integration of flexible decentralised thermal power generation" was added as a specific task to the Final 10 years R&I roadmap 2017-2026 of the Smart network for energy transition ETIP (ETIP-SNET);
- A new paragraph referring to micro combined cooling, heating and power (CCHP) and MGT was added to the issue paper released for the Action 5 (Energy Efficiency in Buildings);
- Polygeneration and hybrid MGT system has been selected as one of the main topic in the Action 6 working group (Energy efficiency in industry).

Figures

3 to 500 kWe is the electrical output for a Micro Turbine.*

3 to 1,500 kWth is the thermal output, with an exhaust gas temperature between 250-300 ºC.

17%-33% is the potential reduction of CO_2 emissions for a household permitted by micro-CHPs technologies, according to a study by Cogen Europe and Delta.

45% of the energy consumption in the EU is used in residential sector. ***50%*** of the demand are for heating.

50% of the MGT market are represented by oil and gas applications, 40% by commercial and industrial CHP, 8-9% by renewable energy applications and the last 1-2% by other markets such as hybrid vehicles or marine applications (figures by Capstone, MGTs largest manufacturer).

90% is the potential overall efficiencies of Micro Gas Turbines with micro CHP systems (electrical efficiency of more than 30% with the heat exchanger).

** Average data given by the OEMs drafting the MT Technology summary.*

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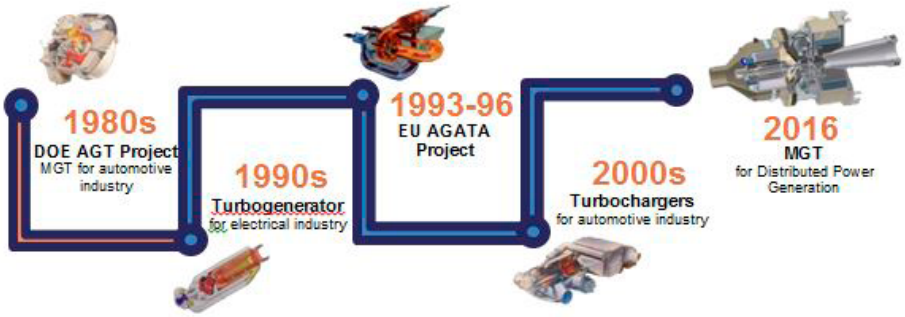

Timeline of the MGT Technology development

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ETN is also a member of the Stakeholders Group of the Bio-HyPP project (see previous Quarterly Newsletter). Our organisation also dedicated a section of the 2016 International Gas Turbine Conference and a meeting during the 2016 EU Sustainable Energy Week (EUSEW) to MGTs. The MT Technology summary, once finalised, will be another support for ETN's effort to promote this technology. More information on ETN website. ■

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ETN R&D Recommendation Report: revised edition

The Project Board of ETN has revised and completed its 2016 R&D Recommendation Report. The new document can be found on ETN website!

2017 meetings of ETN's User groups

ENGINE-SPECIFIC USER GROUPS

ETN has launched the registration for the 2017 meetings of its User groups dedicated to the LM 2500 and the Industrial RB211 gas turbine models. Those yearly, members-only events intend to address the issues met by the gas turbine user community of these engines and to trigger a dedicated response from the OEMs, ISPs and the R&D community. Each meeting lasts two days and offers the opportunity to discuss openly the issues, which have been collected and ranked according to level of priority beforehand. The Industrial RB211 user group will meet on 3 and 4 May 2017 in Milan and the LM2500 user group will gather on 14 and 15 June in Brussels. For more information, you can refer to our website: www.etn-gasturbine.eu/usergroups. Alternatively, you can contact lm2500@etn-gasturbine.eu and industrialrb211@etn-gasturbine.eu ■

The Chinese market of Gas Turbines, today and tomorrow

This issue of ETN's Quarterly newsletter proposes you to explore the GT market in China and to assess the opportunities that it offers. TIAN Chao and YANG Lei, Founder and Co-founder of NexTurbine have accepted to answer ETN's questions.

YANG Lei and TIAN Chao, NexTurbine

In a recent report*, you express a great optimism for the gas turbine technology and the growth of its market in China. Could you tell us what makes you so positive?

China is one of the most important gas turbine market in the world in both new orders and Operations and Maintenance (O&M) market. As of April 2016, installed gas power capacity in China is 78.6 GW, which makes it the 2nd largest country in gas power. Most of the turbines are still in the early or mid-stage of their life cycle (about 70% are installed in the past 10 years). There are great potentials to leverage in O&M market for these installed capacities. In the latest national planning, China has added another 50 GW of gas power and is expected to reach over 110 GW by 2020. With an increasing environmental concern, and national support from top level, we will not be surprised if China takes the lead on the new orders market in the near future.

Also, a noticeable trend is that China is playing a more active and important role in the value chain of the global gas turbine market, through cross border acquisition, investment and partnership. Ansaldo Energia just reported a best year of gas turbine orders in terms of global market share: such record could not have been achieved without strong support from Shanghai Electric, its 2nd largest shareholder and strategic partner in technology and market development. Besides, China is helping developing countries to build gas power plants through its Silk Road Fund (see below) and national policy loans. We foresee more gas power plants will be built and operated by companies from China and that China will continue to spark in the global gas turbine market, both in terms of its great domestic market potential and through its active participation in global projects.

NexTurbine®

What is the current mix of gas turbines fleet in China (heavy duty, aero derivative, CCGT, single cycle)? Where do you see the highest growth potential?

Heavy duties accounts over 90% of China's gas turbine capacity, while small gas turbines including aero derivative account for less than 10%, according to a report by the National Energy Administration in 2015. CCGT will dominate the 50 GW of gas turbine power capacity that is planned to be installed in the Government's 13th Five Year Plan (2016-2020). Currently, about 5GW is planned to be single cycle GT's as peaker plants to balance renewable energy. This includes 15GW planned for distributed CHP/CCHP plants generated by small & aero derivative GTs.

Could you shortly summarise the policy of the Chinese Government in terms of energy generation, air quality and climate change and what impact we could expect?

"Control coal power" and "promote greener energy" are the two key points in China's energy generation policy. Every five years, the government of China reviews its achievement and sets a new plan about all important national development issues. China's top planning body, the National Development

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Figures

2% of the total electricity and ***4.40%*** of the total heat produced in China come from gas. Coal amounts respectively to 72%* and 89%*.

3.93 MWh/capita is the total yearly energy consumption in China (7.04 in Germany, 12.96 in the USA*).

78.6 GW is the installed gas power capacity in China, targeting 110 GW by 2020**.

680 GW is the renewable capacity target by 2020 set by the government of China**.

2593.11 Mtoe is the total energy production in China in 2014 (USA: 2011.98, France's 137.13*).

** Figures by the International Energy Agency, 2014 (latest figures available)*

*** Figures by NexTurbine*

* Report to be found on www.nexturbine.net

Huaneng Nanjing CC, Configuration 2 X 200-MW, 1+1 CCGT blocks with 9001E gas turbines

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and Reform Commission (NDRC) just released the 13th Five Year plan (FYP) for energy generation in November 2016. In this 13th FYP of power generation development, coal power is strictly controlled; more than 150 GW of planning and under-development coal capacity will be cancelled or delayed (34.61 GW of these have already been announced in September 2016 and January 2017), while greener energy generation sources are promoted and prioritized, including hydro, wind, solar, cogeneration and distributed energy.

As for the air quality policy, 2011 was a turning point, when smog became so severe that it affected millions of people in northern and north-eastern China. To address the air pollution issue, the State Council passed the Air Pollution Prevention and Control Action Plan in 2013. Since then, many measures and actions have been taken to combat the air pollution issues, including a wholesale "switch from coal to gas" in Beijing within 2 years (2013-2015), with 6130 MW cogeneration capacity put into operation. The "Switch from coal to gas" program is likely to continue, as there are many remaining industrial coal boilers operating in industrial parks, manufacture plants, and residential districts in 2nd and 3rd tier cities.

Another significant impact of domestic policy comes from China's international commitment for emissions control. In 2015, China submitted a plan to the UN, ahead of the COP21 in Paris, committing to 'work hard' to peak emissions earlier than the 2030 targets and aiming to cut its greenhouse gas emissions per unit of GDP by 60-65% compared with the 2005 levels. To achieve such a target, China will need additional reforms, especially in the energy generation sector, where coal power dominates the current energy mix.

Since 2015, China has the largest renewable power capacity, according to the 2016 Global Status Report on Renewables. What is the target when it comes to the growth of renewable energy in China?

It is clear that China will set a new world record of renewable energy capacity by 2020. The 13th Five Year Plan of Renewable Energy sets a 680 GW renewable capacity target by 2020, including Hydro power capacity (340GW), Wind (Utility Scale, 210GW) and Solar PV (Utility Scale, 105GW).

As the penetration of renewables increases to meet climate targets, how does China plan to handle the problem of intermittency?

China's biggest challenge regarding renewable energy is not intermittency yet, but a high level of "curtailment", when wind or solar energy is available but unable to get onto the grid fully, effectively wasting it. China has a 149 GW wind capacity, amounting to 9% of total installed capacity but only 4% on-grid electricity is generated from wind annually. In 2016, 49700 GWh wind energy were wasted, which is more than the total annual wind generation in Spain in 2015.

They said...

The EU Commissioner for Climate Action and Energy **Miguel Arias Cañete** visited China on 29 March-2 April, highlighting cooperation in the fields of climate action and clean energy:

"The EU and China are joining forces to forge ahead on the implementation of the Paris Agreement and accelerate the global transition to clean energy. Our successful cooperation on issues like emissions trading and clean technologies are bearing fruit. Now is the time to further strengthen these ties to keep the wheels turning for ambitious global climate action. In these turbulent times, shared climate leadership is needed more than ever."

In a most recent policy, the Chinese government has called for more peaking units to be ready within the regions rich in renewable energy. In 2016, the National Development and Reform Commission (NDRC) and the National Energy Administration (NEA) jointly issued "The measures on prioritizing electricity generation from renewable energy peaking units". It requires renewable energy to have a clear consumer market and on-grid quota before planning projects. It also requires power generation units (coal and gas) to raise the standard of peaking capability, considering a higher requirement of peak load from grid in terms of design, manufacture and product selection. This indicates higher flexibility is preferred for new gas turbines as peaking units.

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The Chinese government also encourages companies to explore ways to incorporate renewable energy in an integrated energy system. GCL System Integration Technology Company, which is a subsidiary company of GCL, (one of the world's top 10 solar PV manufacturer and solution provider), also invests in gas power and distributed energy system. They are developing system solutions to integrate and optimize multi-energy sources, with a successful demonstration project completed in the company's headquarters in Suzhou, which integrate gas, solar PV, wind, geothermal and energy storage into one regional energy system (called 'Six in One').

The Chinese authorities have made a priority of the New Silk Road project. Can you see significant opportunities for the gas turbine technology and its actors in this project?

One Belt, One Road (OBOR) refers to The Silk Road Economic Belt and the 21st-century Maritime Silk Road; it is a development strategy and framework that focuses on connectivity and cooperation among countries primarily between the People's Republic of China and the rest of Eurasia, covering 65 countries and extending to Africa through a 48 year-cooperative Memorandum of Understanding (MoU) signed in 2015 with the African Union.

Countries that OBOR covers are also markets with a high potential for gas turbines, where electricity supply is still in deficit. New gas turbine orders are awarded to OEMs, partnering with Chinese EPCs as turnkey contractors with loan from OBOR funds. For example, China Machinery Engineering Corporation (CMEC) was awarded gas power projects or signed MoU in Angola, Belarus, Iraq, Indonesia, etc. Another example is the undergoing 1,180MW Bhikki combined-cycle power plant in Punjab using GE's latest 9HA turbines. When put into operation, Chinese companies will also be contracted as plant operator for some projects, and as such, we believe that there will be opportunities for O&M service providers to cooperate with these Chinese operators. ■

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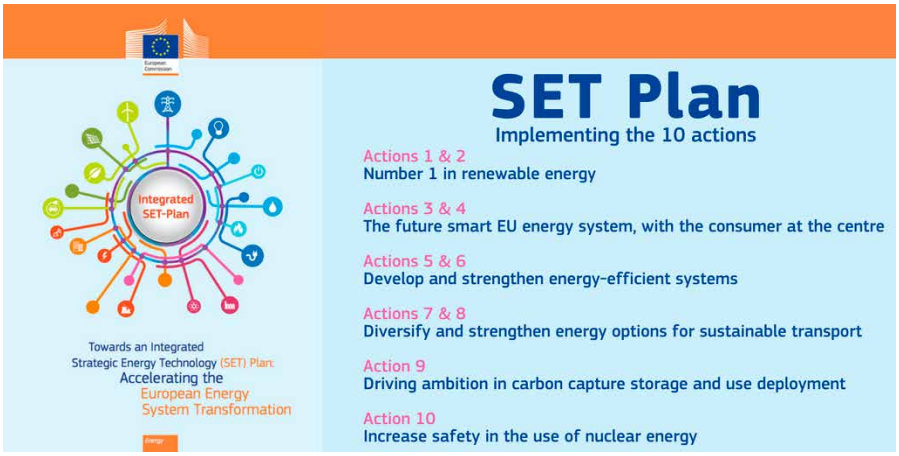
Opportunities for turbines in the SET-Plan

As regularly reported in our Quarterly Newsletter, ETN is an active contributor to the EU Strategic Energy Technology Plan (SET-Plan). The recent developments could open opportunities for the gas turbines technology.



Action 4: Resilience & security of energy system

The European Technology and Innovation Platform "Smart network for energy transition" (ETIP-SNET) has installed 5 working groups aiming at defining the contribution of different technologies to the future European energy system. In the last issue of its Quarterly Newsletter, ETN had circulated a call for experts to take part to those groups. Several experts from the ETN community are now part of the Working Group dedicated to Flexible generation (the comprehensive full list is available on www.etip-snet.eu). This working group will define an implementation plan for flexible generation and set a basis for research activities needed for the future energy systems.

Action 6: Energy efficiency for industry

The European Commission has shortlisted 12 topics related to energy efficiency in the industry that are now being evaluated by the member-states. Cross-cutting technology solutions have garnered a strong interest among the stakeholders for its ability to be applied in different sectors. ETN has previously submitted comments to the Issue paper together with EUTurbines and Cogen. National funds may be allocated on the basis of this list of topics, once fully assessed.

Action 9: Carbone capture storage and use (CCS/U)

A working group, gathering member-states is currently drafting an implementation plan. This plan shall list research activities based on the targets in the Action 9 Declaration of intent, which was published after the comments submitted by the different stakeholders on the initial Issue paper (including ETN). ■

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Major changes to the US climate change policy

The President of the USA Donald J. Trump has signed an executive order (entitled "Energy Independence") on 28 March repealing the Clean Power Plan adopted under President Obama, which aims to curb greenhouse gas emissions from power plants by 32% below 2005 levels by 2030 but was not implemented yet as some states were challenging it in court. The order also decreases criterion based on carbon emissions for permits, removes the consideration of the "social cost of carbon" in the process of policy decisions by federal agencies, reverses rules curbing methane emissions from oil and gas production and removes the memorandum blocking the creation of new coal mines on federal lands. This is a strong sign of support to the coal industry from President Trump who stated that his "administration is putting an end to the war on coal" and exposed his plan to "have clean coal. Really clean coal". Numerous representatives of the coal industry actually attended the signature of the executive order at the headquarters of the Environmental Protection Agency (EPA). Funding of the EPA has also been drastically cut in the draft 2018 Federal budget. During his visit in China, the EU Commissioner for Climate Action, Miguel Arias Cañete has warned that other signatories of the Paris Agreement may be tempted to follow but has stressed that "the EU and China will forge ahead with the Paris Agreement and the clean energy transition". However, no sign has been made by the USA yet to pull out of the Paris Agreement. Bill Becker, director of the National Association of Clean Air Agencies, underlined that "85% of US states are on track to meet the targets despite the fact the rule has not been implemented". ■

A White paper of the Industrial Emissions Directive

ETN's Committee dedicated to the Industrial Emissions Directive and its Best Available Technology Reference Document for the Large Combustion Plants (LCP BREF) has been working on a White paper addressing the issues that the current draft of the BREF has left pending. This document will be addressed this month to our members, representatives of the stakeholders and the European Commission as well as the national authorities in charge of the implementation of the directive. The IED curbs emissions of pollutant emissions from industrial installations and define conditions for new installation permits based on the Best Available technology: the BREFs are consequently strategic documents for the industries.

For more information, contact Thibault Boutherin: tb@etn-gasturbine.eu ■

The EU-Emissions Trading System beyond 2020

The European Parliament and the Council of the European Union are currently debating the reform of the EU Emissions Trading System (EU-ETS) for after 2020. The current system (2013-2020) introduced EU-wide limitations, replacing national ceilings, and is based on auction by default instead of free allocations. As it is still suffering from low prices due to an excess of permits, new rules are under development. The future system should help the EU fulfill its targets set at the COP21 and efficiently curb greenhouse gas emissions while protecting energy-intensive industries and ensuring high carbon prices. The final phase of the legislative process has started with discussions between the two EU institutions. ■

Figures

18 months since the talks have started on the reform of the current EU-ETS.

19 member states out of 28 have given their support to the position adopted by the Council of the EU.

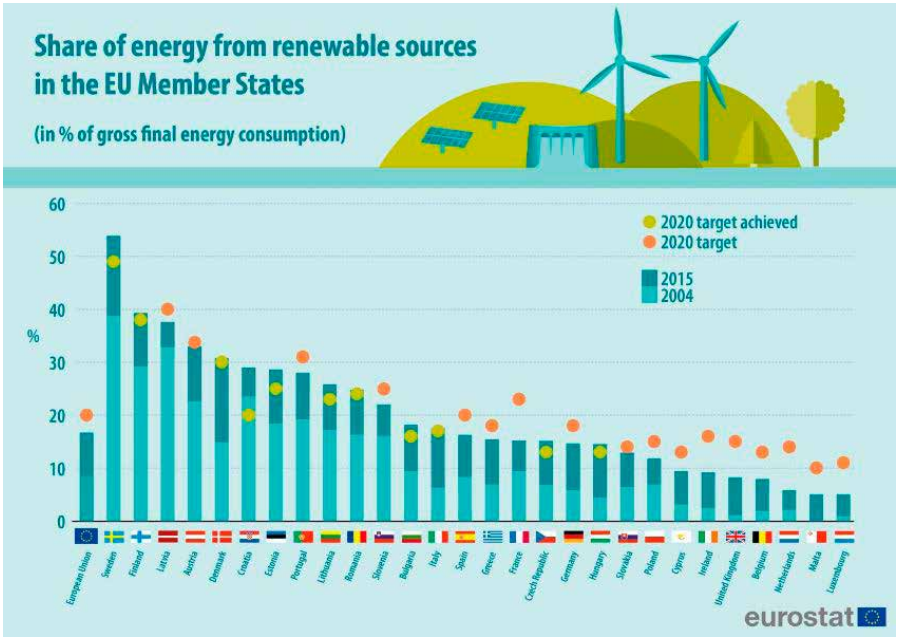
43% compared to 2005 levels is the target of greenhouse gas emissions curb by 2030.

57% of the emissions allowances during the current period (2013-2020) are auctioned, the rest being allocated for free to protect the competitiveness of their sector.

11.000 plants and power plants are covered by the EU-ETS in a total of 31 countries (EU + Iceland, Liechtenstein and Norway).

The EU progressing towards its 2020 targets

Figures published by the EU attest a good progression towards the completion of the 20% target set for 2020 in terms of renewables share in the gross energy consumption. In 2015, the share of RES at EU level was 16.7% (doubling the 2004 level), with 11 member states having already fulfilled their target. ■



Upcoming meetings and events

Meeting/Event	Date	Location
Turbine Forum 2017: Manufacturing, Repair & Life Extension of Turbine Components	26-28 April 2017	Nice, France
Industrial RB211 User Meeting	3-4 May 2017	Milan, Italy
ETN's Annual General Meeting*	10-11 May 2017	Oberhausen, Germany
4th European HRSG Forum	16-18 May 2017	Amsterdam, the Netherlands
NexTurbine Conference**	17-18 May 2017	Wuxi, Jiangsu, China
LM 2500 User Meeting	14-15 June 2017	Brussels, Belgium
EU Sustainable Energy Week 2017	19-25 June 2017	Brussels, Belgium
ETN Workshop	4-5 October 2017	Genoa, Italy

** Open to ETN members exclusively. Access to the page on website requires being logged-in*
*** ETN members are entitled to a 10% reduction in registration fee and exhibitor's booth fee.*

ETN Team

Christer Björkqvist Managing Director

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Ugo Simeoni Technical Project Manager

Ignacio Lescano Carroll Technical Project Officer

Ilona Kolb Financial and Administrative Officer

André Mom External Consultant

David Bosak Researcher (Cranfield University/ ETN exchange programme)

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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EUROPEAN TURBINE NETWORK

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