ETN NEWS

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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 the operation of environmentally sound gas turbine technology with high reliability and low cost.

In this issue

Christer Björkqvist
Managing Director

The importance of gas and hydrogen in the decarbonisation process gain recognition

The strong statement by the European Commission President-elect Ursula von der Leyen to make Europe the first climate-neutral continent in the world by 2050 and her commitment to put forward a "Green Deal" with an increased 2030 CO_2 reduction target to 55%, or at least 50%, in her first 100 days in office has resulted in a flow of questions and statements of how this could be achieved. Such a "Green Deal" could provide large opportunities for the gas turbine industry, as I believe the increased target could only be met through an accelerated shift from coal to gas. As the hydrogen wave is building and gaining momentum among the public and politicians, gas turbines are starting to be seen as not only a transition technology, but also as a technology for a carbon-neutral society. This increased acceptance is both opening up for accelerated carbon reductions through higher utilisation of the current fleet of gas turbines, as well as investments in the next generation of more flexible and efficient gas turbines that can handle 100% hydrogen.

Kadri Simson, the EU Commissioner-designate for Energy stated that she wants to examine how we can best make the gas regulatory framework and infrastructure fit for the future, contributing to decarbonisation through the use of low carbon gases such as hydrogen. She also made it clear that when the EU Commission is talking about gas in the future we are talking about bio-gases and hydrogen that can help us for sector coupling.

*Florian Ermacora, Head of Wholesale markets; electricity and gas at the European Commission's Directorate-General of Energy recently stated at a conference in Brussels that the Commission is convinced that natural gas will play an important role. "**We need gas because it can be stored, flexibly produced, and more cost-effectively transported than electricity**."*

Jorgo Chatzimarkakis, Secretary General at Hydrogen Europe, stated in a very enthusiastic presentation at ETN's October Workshop that Hydrogen is a "multitalent", and it is the wide opportunities as an energy carrier that make hydrogen such an interesting and useful solution. He highlighted that hydrogen can be used to enable a large-scale integration of renewables and to deliver clean power generation, but also to distribute and to store energy. As such it will help in the decarbonisation process of transport, industrial energy use, buildings (heat & power) and serve as a renewable feedstock.

*Frans Timmermans who is set to become the executive vice-president as well as the European Commission's new climate chief, with the key objective of bringing the European "Green Deal" policy to life, stated in the European Parliament hearing that "**hydrogen could be a huge opportunity for our economy**", and continued: "**It is not that difficult to use the pipelines and LNG terminals that are now used for gas to transport hydrogen.**" He is completely right that we must use the existing assets and infrastructure to ensure cost-efficient solutions but also, of equally importance, to ensure timely solutions in place that can help in meeting the carbon reduction targets.*

In the beginning of October ETN held its yearly High-Level User meeting, followed by ETN's October Workshop, with a key objective to accelerate development of carbon-neutral, flexible and cost-efficient technology solutions, as well as to reduce the carbon footprint of current operations. The high attendance of more than 200 delegates showcases the high interest and commitment among the gas turbine community to cooperate on these topics which is very promising. Not only hydrogen was covered at this meeting but also supercritical CO_2 advanced cycles, as well as component lifetime assessment. Life assessment is an important topic, as future gas turbines operations are faced with an increasing amount of starts and stops, as well as part load operations. You can read more about this meeting in this newsletter and you can also download the presentations on our website and actively participate in our Working Groups on these topics if you are an ETN member. If not, join us and help us to progress even faster towards our vision of safe, reliable and carbon-neutral gas turbine operations.

IGTC 2020: Call for Papers

ETN's 10th International Gas Turbine Conference (IGTC) "The role of gas turbines in a carbon-neutral society" will take place on 14-15 October 2020 at Le Plaza Hotel in Brussels, Belgium.

The IGTC-20 Conference Advisory Board welcomes submission of Papers in the following gas turbine research areas and application fields:

- **Technical papers** describing technology advances and innovative solutions
- **Review papers** giving a comprehensive technology overview of the past 2 years
- **Case study papers** describing recent experiences

Submitted research papers and application oriented papers should demonstrate a high importance and interest to the gas turbine user community and be related to one or several of the five categories below. ETN's R&D Recommendation Report provides more details of relevant R&D topics. The highlighted topics of each category include, but are not limited to:

Decarbonisation and emissions reduction

- Power-to-X-to-power technologies
- Retrofit and newly built H_2 power plants
- Integration of GT hybrid solutions
- GT advanced cycles (wet cycles, sCO_2, exhaust gas recirculation, hybrid cycles, integration of storage solutions, heat pumps etc.)
- Environmental life cycle assessment
- Emission reduction on existing gas turbines
- Decentralisation and distributed generation
- Carbon caption and storage
- ….

Flexibility

- Extended fuel spectrum (hydrogen, biomass, ammonia, LNG/LPG…)
- Operational GT flexibility
- Maintenance flexibility
- Emission at flexible load and cycling
- Efficiency at partial and minimum load conditions
- Reliability (material and life impact)
- Plant and system flexibility
- ….

Digitalisation

- Condition monitoring and lifing
- Digital engine modelling, digital twins
- Plant and system integration
- Integration in virtual power plant
- Data management, architecture & security
- ….

Asset optimisation through life cost

- Overall system efficiency
- Condition-based maintenance
- Extension of service intervals and total engine life
- Component lifing
- Predictive maintenance
- Sensors & Instrumentation
- New component developments
- Additive manufacturing and repair
- ….

Economic, policy, market

- Economic impact on technical solutions in line with the market conditions and policy framework
- System analysis
- Emissions legislation
- Regulatory framework
- … ■

Deadline for abstract submission:
4 December 2019

About IGTC

The International Gas Turbine Conference (IGTC) is a well-established and renowned biennial conference, organised by ETN, representing the whole gas turbine community. Its objective is to raise the awareness of gas turbine (GT) and turbomachinery technology development needs – from operators' perspectives – and to explore and exchange ideas with GT experts from the whole value chain attending from all continents. It also provides the opportunity to meet and discuss with policymakers the role of gas turbines in future energy scenarios. The conference highlights the energy market outlook in Europe and in key markets globally, as well as presents and disseminates current R&D activities and latest achievements for flexible, efficient, reliable and environmentally sound gas turbine technology.

More information about the abstract submission and conference is available on our IGTC-20 webpage: https://etn.global/events/igtc-20/ ■

New members

We warmly welcome University of Salerno (Italy), Brunel University London (United Kingdom), Phoenix BioPower (Sweden), Oerlikon AM (Germany), Allied Power Group (US), University of Perugia (Italy) and Infosys (Switzerland) who recently joined the network. ETN has currently 118 members from 23 countries.

University of Salerno leads and performs innovative research activities, within projects funded by the EU and Italian government and industry, and cooperates with universities and research centres at both national and international level. Its main research areas include energy, mechatronics, automotive, chemistry, material, nano-materials, management, computer science and electronics.

Brunel University London's Institute of Energy Futures carries out both applied and fundamental interdisciplinary research in close collaboration with industry, as well as in EU and UK funded projects. It possesses experimental and computational facilities which include new innovative waste heat to power technologies, cooling and heat pump technologies and CHP and trigeneration equipment.

Phoenix BioPower is developing the future of biomass-fired power generation systems, the BTC – a high-pressure and integrated plant to convert biomass to power. Phoenix BioPower is based in Stockholm, Sweden.

Oerlikon AM is a business unit of the global technology and engineering powerhouse Oerlikon, which is headquartered in Switzerland. Oerlikon AM provides print-tested and qualified metal powders, design for AM expertise, conventional and additive manufacturing services, from prototyping to production, as well as product validation and quality inspection support.

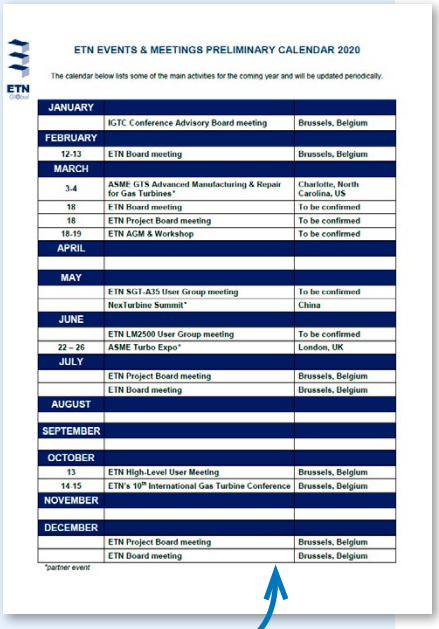
Allied Power Group (APG) is a privately owned industrial gas turbine repair facility, headquartered in Houston, US. APG provides component repair, parts supply, field service and engineered performance solutions on a wide range of industrial gas turbines.

University of Perugia, founded in 1308, is one of the oldest universities in Italy. The university offers a wide variety of courses and is organised into 16 departments.

Infosys provides next-generation digital services and consulting, with experience in managing the systems and workings of global enterprises, with particular strengths in AI and data analytics. The company is headquartered in Baden, Switzerland. ■

ETN Hydrogen Report

ETN's Hydrogen Working Group met at our October Workshop in Florence to follow up on the activities within the Working Group and to continue the work on ETN's Hydrogen Report document. The objective of this publication is to pave the way for hydrogen utilisation in the gas turbine based power plants. The report will show the role of hydrogen gas turbine as a future carbon-neutral technology that can help the society to cut the emissions and achieve the energy and climate targets. Gas turbines fulfil the crucial balancing role already in the existing energy landscape but there will also be a role for hydrogen gas turbines in the energy transition and beyond. The Hydrogen Report will be published on ETN's website in November – stay tuned! ■



ETN EVENTS & MEETINGS PRELIMINARY CALENDAR 2020

The calendar below lists some of the main activities for the coming year and will be updated periodically.

JANUARY		
	IGTC Conference Advisory Board meeting	Brussels, Belgium
FEBRUARY		
12-13	ETN Board meeting	Brussels, Belgium
MARCH		
3-4	ASME GTS Advanced Manufacturing & Repair for Gas Turbines*	Charlotte, North Carolina, US
18	ETN Board meeting	To be confirmed
18	ETN Project Board meeting	To be confirmed
18-19	ETN AGM & Workshop	To be confirmed
APRIL		
MAY		
	ETN SGT-A35 User Group meeting	To be confirmed
	NexTurbine Summit*	China
JUNE		
	ETN LM2500 User Group meeting	To be confirmed
22 – 26	ASME Turbo Expo*	London, UK
JULY		
	ETN Project Board meeting	Brussels, Belgium
	ETN Board meeting	Brussels, Belgium
AUGUST		
SEPTEMBER		
OCTOBER		
13	ETN High-Level User Meeting	Brussels, Belgium
14-15	ETN's 10th International Gas Turbine Conference	Brussels, Belgium
NOVEMBER		
DECEMBER		
	ETN Project Board meeting	Brussels, Belgium
	ETN Board meeting	Brussels, Belgium

*partner event

Preliminary meetings & events calendar for 2020

Preliminary calendar of planned and confirmed activities for the forthcoming year, including ETN meetings and events as well as external conferences ETN cooperates with, is now available on our website. There are also many exciting activities going on within our Working Groups, but the schedule for these individual meetings is still under discussion and will be updated to our website as soon as the meetings are confirmed. ■

ETN's October Workshop set a new participation record

ETN's biennial October Workshop saw an excellent participation with 212 attendees; a new record for ETN events! The Workshop took place in Florence, Italy, on 1-2 October 2019, and was kindly hosted by Baker Hughes at their Florence Learning Center. ETN members had also an opportunity to attend a plant tour and visit Baker Hughes' facilities on 1 October before the official opening of ETN's Workshop.

Michele Stangarone, Chairman Nuovo Pignone and Vice President at Baker Hughes warmly welcomed the participants to Florence. He highlighted the excellent timing of this Workshop, referring to the 500th anniversary of the death of Leonardo Da Vinci, and showcased a photo of a Da Vinci painted Baker Hughes engine.

Bernard Quoix, ETN President (Total) thanked Baker Hughes for their generous hospitality in his speech, and greeted the 10 new members who had joined ETN after the Annual General Meeting in March 2019. He welcomed the wide participation and highlighted that exchanging experiences, best practices and exploring solutions in our Technical Committees and Working Groups have proven to be an efficient way to progress towards our common goals, making the whole industry more competitive. He also highlighted the importance of a common vision and commitment to make our industry a key player in the energy transition and beyond, which is the fundamental objective of ETN.

ETN Managing Director Christer Björkqvist addressed a special note to selected students from Italian universities who had been invited to join the event and follow the discussions on the first day. He also introduced ETN's Young Engineers Committee, a new initiative with the aim to provide promising engineers at the start of their career an opportunity to interact with leaders and technical experts of the ETN community. The role of this committee will be to support and develop ideas and projects of common interest in the energy transition and help ETN to progress towards our objectives.

Cath Goy, ETN Vice President (Uniper) reported on outcomes of ETN's High-Level User meeting, which took place in Florence one day ahead of the October Workshop. She listed the following R&D interests and needs of the users for the upcoming years:

- Energy Efficiency and Emissions
- Decarbonisation
- Advanced cycles
- Cost optimisation
- Digitalisation
- Flexibility
- Additive manufacturing
- Knowledge and experience transfer
- Operation in harsh environment

Cath Goy highlighted the two newly added topics "Additive manufacturing", currently covered by ETN's AM Working Group, and "Knowledge and experience transfer", of importance to all participating organisations to attract and train new talents across the whole gas turbine industry.

Peter Jansohn (PSI) opened the session "Developments and applications of sCO_2 power cycles for the future energy scenario" and introduced the topic of supercritical CO_2 cycles, which is gaining momentum around the world and sees various development paths being investigated. Sungho Chang (KEPCO Research Institute), Giuseppe Bianchi (Brunel University), Andrea Burrato (Baker Hughes) and Renaud Le Pierres (Heatric) presented the views of their organisations and discussed the potential of supercritical CO_2 cycles during the panel discussion. The panellists stated that sCO_2 based technologies will provide promising solutions for CO_2 capture, energy efficiency improvements, compactness of generation unit, and economy of steam / water resources. They highlighted that in order

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ETN's October Workshop

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to successfully hit the market, further experience is needed to make the technology commercially viable. Further developments are needed in order to convince users to try the technology, which eventually involves responding to their requests for short return on investment, and addressing concerns on the negative influence the sCO_2 cycle may have on business and operation.

Hydrogen is currently one of the hot topics in the energy transition for the gas turbine community, and it was covered during several Workshop sessions in Florence. Jorgo Chatzimarkakis, Secretary General of Hydrogen Europe highlighted that the current policy landscape in Europe is supportive of hydrogen. Developing hydrogen's full potential will need further effort, mainly in sectors coupling and combination which will build bridges between electricity, hydrogen and natural gas systems. He noted that there are already several roadmap publications highlighting positive outlooks for hydrogen in different scenarios. These roadmaps go along with an increased political willingness around the world to develop technologies and start implementing hydrogen-based solutions. If the EU does not want to miss the boat, it will be critical to keep supporting and investing in hydrogen.

Marco Tarenzi then presented the ongoing and future initiatives for the decarbonisation with injection of hydrogen in the gas grid. The presentation was followed by Rob Versteirt's introduction to ENGIE's service strategy to address the zero-carbon transition and Olaf Brekke's presentation on Equinor's low-carbon initiatives for CO_2 reduction.

In the evening on 1 October, ETN members were invited to attend a dinner at La Loggia restaurant on Piazzale Michelangelo, with a beautiful view over Florence. The dinner was generously sponsored by Baker Hughes and provided an excellent opportunity for networking and exchanging views with ETN members from the entire value chain.

On the second day, parallel sessions were held to discuss the activities and projects introduced within ETN's Technical Committees, including topics such as supercritical CO_2, hydrogen, additive manufacturing and component life assessment. ETN is now following up on the actions that came out of the individual Technical Committee meetings and will work on these topics to feed next year's meetings and events. We would like to thank Baker Hughes for their hospitality, as well as all our participants for joining the event and making it a success. We look forward to seeing our members at ETN's Annual General Meeting and Workshop in March 2020.

The Workshop Summary Report and all presentations are now available for ETN members on our website. ■

ETN at EUW & POWERGEN

European Utility Week POWERGEN EUROPE

12-14 November 2019 | Paris, France

ETN will be present at European Utility Week & POWERGEN, taking place in **Paris, France, on 12-14 November 2019**. If you are planning to attend the conference, come follow the Hub Session ***"Gas turbines in a carbon-neutral society"***, chaired by ETN's Managing Director Christer Björkqvist, on the opening day 12 November from 14:00-17:30. ETN will also participate in the exhibition – come and meet us at booth number A10!

REGISTER HERE

for a free visitor pass to access the Hub Sessions and the exhibition area.

Interview with Gastops

Lifetime extension for gas turbine components was highlighted as an important topic to address by ETN's SGT-A35 (formerly Industrial RB211) and LM2500 user communities at their meetings in May and June earlier this year. Remaining lifetime assessment was also a prioritised topic at ETN's Workshops in March and October, where the Technical Committee 4 sessions were dedicated to this topic and included presentations from the users, R&D community and suppliers. ETN caught up with Gastops, who is an independent equipment supplier focusing on developing innovative contributions to the maintenance, productivity, and safety of critical equipment used in aviation, energy and oil & gas industries, to see how they are progressing in their efforts.

Gastops attended ETN's LM2500 User Group Meeting 2019 in Stavanger

Oil quality and methods of assessment was one of the topics highlighted by the users during ETN's User Group meetings. What help could Gastops offer on this topic and are there any new products that could be developed in collaboration with ETN's user community? At what stage of the development are you?

Recognizing the market need for online oil quality measurement, Gastops has been actively researching and developing technology solutions for this need. The first stage of R&D that began over 5 years ago, was focused on developing a fundamental understanding of how oil quality degrades for different oil types, applications and operating conditions. Gastops collaborated with academia and published several scientific papers. Based on these findings, potential technology solutions were tested, and the optimum solution was found to be fluorescence spectroscopy. Similar to lab-based methods, this technique analyses the chemical composition of the oil and therefore, is a method of direct measurement of changes in the oil. This contrasts with typical online sensors that offer indirect measurement by monitoring physical parameters. The advantage with this technology is that it can be applied in an online sensor, providing real-time monitoring and eliminating the need for sampling. Gastops has tested this innovative technology on a variety of oil types and validated it with field samples against lab methods. Two iterations of product prototypes have also been developed. Currently, Gastops is conducting a prototype trial with an industry partner for aeroderivative and heavy-duty gas turbines. Gastops is looking to collaborate with ETN's user community to understand their specific needs and conduct more prototype trials to further develop this new oil condition sensor product and the oil degradation models that are used to predict remaining useful life.

Bearing failures have been addressed through ETN's Bearing Project that started in 2017. At ETN's SGT-A35 and LM2500 User Group Meetings earlier this year, Gastops presented the MetalSCAN technology but also engaged in discussions with the users on their needs. Could you provide more information on the latest technology developments and future plans?

MetalSCAN debris sensing is a mature technology, but strong investment in innovation and technology development continues to be Gastops' vision. Debris sensing is one of several R&D projects at Gastops, including our own bearing test facility which became operational this year. Another important R&D initiative is the development of our Digital platform. Our Engineering team has developed our new MetalSCAN electronics version, MS4000, to replace the legacy electronics. Long time existing customers are implementing the new MS4000

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Interview with Gastops

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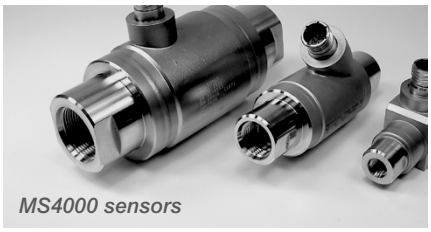
electronics upgrade for improved performance, longer life and long-term support. Important user feedback that we have received is the need to enhance MetalSCAN monitoring in order to realize the full prognostic capability. In order to respond to this feedback, the new MS4000 software has introduced a revamped HMI as well as built-in real-time connectivity to remote monitoring (e.g. the onshore Turbine Managers). Offline analysis has been a capability of Gastops for many years and this year Gastops has introduced more comprehensive gas turbine services packages to users including MetalSCAN Remote Monitoring, advanced oil sample analysis, chip analysis using our ChipCHECK analyzer and Filter Debris Analysis.

Digitalisation has been addressed on several occasions at ETN's Workshops in the previous years, and following the discussions within ETN's Technical Committees 4&5, a white paper on digitalisation was published in 2018. It remains as a topic of interest also for the users who see high potential cost cuts. We see that Gastops has currently a sound offering of solutions and plans to widen the scope in the future, with the objective to provide more comprehensive information on the engine condition. As for today, how well do these different solutions integrate within the existing system of an operator, and what perspectives do you see for innovation in combining different signals to create synergy and provide better prognostics?

A major part of Gastops' innovation agenda is connecting all the different monitoring and analysis solutions that Gastops provides and adding more condition assessment intelligence to deliver more value to customers. With Gastops' expanding products and services portfolio, including MetalSCAN, ChipCHECK, blade health monitoring sensors, the new oil condition sensor in development, and oil analysis, vibration and modelling services, a comprehensive condition monitoring solution is possible. On the intelligence side, we already use state of the art machine learning and artificial intelligence techniques in some of our products but for true innovation in data fusion and prognostics, it's the data and the fundamental knowledge that lies beneath the models that makes the difference. Our knowledge and data come from experimental testing of component failure on our own and through OEM and academic collaborations, decades of field application data across several industries, and parts life inspection data that we gather from our repair and overhaul services. With our recently commissioned bearing test facility, we can fail bearings within days under different operating conditions, while collecting and fusing data from over 25 monitoring sources that cover the full range of technology options. With this, we are able to generate statistically significant data and compare it to field data to improve our data fusion and prognostics algorithms. Today, we offer digital solutions for a variety of industries including energy, aviation and railways and the integration method varies. For some, our systems and modules are integrated within the existing system of the operator or OEM, and for others we offer a separate, direct monitoring portal.



MS4000 sensors

OEMs now propose platforms for condition monitoring of an operator's asset, and also offer a large range of specific solutions for monitoring important parameters, such as oil quality or presence of debris previously mentioned. OEMs are demanding for innovative solutions to improve their package and provide more value to their customers, a good example being BHGE expanding their LM2500 standard package to include sensors derived from Gastops' MetalSCAN solution for oil monitoring. One can assume that the integration to a standard package is a lengthy process where many barriers must be lifted. Could you elaborate on the development stages that Gastops has gone through, from an early R&D project to a widely adapted solution?

New MS4000 electronics

It's hard to believe that almost 30 years have passed since the US Air Force and Pratt & Whitney came calling to Gastops for an advanced oil debris monitoring sensor for the Advanced Tactical Fighter aircraft engines. This was the first of many programs where MetalSCAN became the standard debris monitoring sensor for military and commercial flight engines. MetalSCAN testing and validation continued with GE Aviation, Rolls-Royce, NASA, the Air Force Research Lab (AFRL), Canada's NRCC, Australia's DSTO, leading bearing manufacturers and several others. These industries and organizations have very high standards for technology introduction; it has been a lengthy process. MetalSCAN has proven value on hundreds of aeroderivatives as a pro-active indicator where existing techniques and instrumentation are only reactive at best. Decades of experience with research, development, collaboration, validation, learning and improvement is incorporated into every MetalSCAN. Every MetalSCAN is made in Canada at our Ottawa factory (ISO-9001 and AS9100) and is an instrument able to deliver millions in cost avoidance to every user. MetalSCAN has been widely adopted beyond gas turbines: other interesting applications include marine propulsion, wind turbines and even Formula 1 manufacturers.

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Interview with Gastops

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Gastops joined ETN last year and attended our LM2500 User Group Meeting already for the second time this year. Gastops was also present at this year's SGT-A35 User Group Meeting. What was your impression of the meetings and what were the benefits for Gastops to participate?

Gastops at ETN's LM2500 User Group Meeting 2019

Gastops was pleased to sponsor and join the SGT-A35 meeting in Amsterdam, and to return to the LM2500 meeting this year in Stavanger. While the MetalSCAN product was our focus at both events, we greatly valued the discussions with all other attendees about their needs, whether it was one-on-one or as a group. Gastops has found ETN to be an excellent opportunity to connect directly with aero-derivative users on their needs for more advanced products and services to improve operations and maintenance of critical machinery. These needs feed into our R&D roadmaps and help us develop the right solutions. Great for business but also fun events! A big thanks to everyone at ETN for all the hard work and to Shell and Equinor for their support and hospitality. It was great to meet everyone, and we look forward to the next meetings! ■

ETN User Groups

ETN's next SGT-A35 User Group Meeting will take place in the beginning of May 2020. Our LM2500 User Group Meeting will be held in early June 2020. Venues and exact dates for both meetings will be confirmed by the end of this year.

Following the established methodology of the previous years, ETN continues to collect specific enquiries from the SGT-A35 and LM2500 user communities, including operational issues, development needs and clarifications, using the new ETN online platform that was developed earlier this year and which has received a very good feedback from the participating user companies.

As a next step ETN's SGT-A35 and LM2500 User Group Steering Committees will define the main topics of interest ahead of the upcoming engine-specific User Group Meetings. These topics will be shared with the OEMs and relevant ISPs, who will be invited to attend the meetings and to highlight the latest developments in the selected fields during technical discussions with the SGT-A35 and LM2500 user communities. If you would be interested to receive more information on the User Group activities, please contact us. ■

Towards a new EU Commission

Following the European Parliament election in May 2019, the EU leaders nominated Ursula von der Leyen, German defence minister, as the next European Commission President. The European Parliament confirmed von der Leyen's nomination in July, and in September the President-elect introduced her EU Commissioner-designates for the next European Commission 2019-2024.

One of Von der Leyen's statements to the European Parliament in July's hearing was to put forward a "Green Deal for Europe" in her first 100 days in office. She highlighted the need to raise the EU's 2030 emissions reduction target to at least 50% compared to 1990 levels. Von der Leyen's key objective is to make Europe the "first climate-neutral continent in the world by 2050", and therefore she promised to put forward the "first ever European Climate Law" to set the 2050 target into law. She also pledged to introduce a "Carbon Border Tax" to avoid carbon leakage and "turn parts of the European Investment Bank into a Climate Bank".

Von der Leyen nominated Dutch Frans Timmermans, today the First Vice President for the outgoing European Commission, as her Executive Vice-President-designate for the European Green Deal. Timmermans will be responsible for the climate action portfolio, continuing the work of Miguel Arias Cañete. In the European Parliament's hearing in October, Timmermans pledged to deliver a higher level of ambition for 2030 and put forward legislative proposals "as soon as possible". Interestingly he also mentioned hydrogen in several of his answers to the Members of the European Parliament, stating that hydrogen could be a "huge opportunity for our economy" and promised to work on a "hydrogen strategy" during his upcoming term.

Kadri Simson, Former Estonian Minister of Economic Affairs and Infrastructure, was nominated as Von der Leyen's Energy Commissioner, responsible for the EU's energy policy. In her mission letter to Simson, von der Leyen highlighted the importance of gas in the energy transition. *"Gas will have a role to play in the transition towards a carbon-neutral economy, notably through carbon capture and storage."* Simson will also assess how *"sources of supply can be diversified at competitive prices, in particular by making full use of the potential of affordable liquefied natural gas"*.

The legislative "gas package" proposal due in 2020, to be renamed as "decarbonisation package" according to EURACTIV, will be reflecting a growing focus on natural gas as a lower-carbon alternative to coal and oil that could work hand-in-hand with renewables going forward. Enabling the market for biogas and hydrogen, and how to use the existing infrastructure, will be a key part of the Commission's gas package.

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On the day of Simson's EU Parliament hearing, Estonia announced its commitment to become climate-neutral by 2050 and join the group of 24 EU countries in favour of stricter emission targets. This leaves only Czech Republic, Hungary and Poland blocking the deal on EU's net-zero emissions. The EU leaders are expected to finalise their guidance on the EU's long-term strategy on climate change at the EU summit on 12-13 December, meaning that a possible agreement on the 2050 emissions reduction target will not be ready before the start of the United Nations climate change conference COP25, to be held in Chile from 2 to 13 December 2019. ■

Horizon Europe (2021-2027)

European Commission proposed to allocate €100 billion for Horizon Europe, EU's next research and innovation funding programme that will follow the current Horizon 2020 programme. Horizon Europe is due to begin in 2021 and run until 2027. According to Jean-Eric Paquet, European Commission Director General for Research and Innovation, Horizon Europe will support missions in the five following main areas: climate adaptation, clean oceans, clean cities, agricultural soil health and food, and cancer.

As part of the implementation process of the new funding programme, the European Commission launched an online consultation last summer to prepare a 'Strategic Plan' for Horizon Europe. The plan will guide the work programmes and calls for proposals for Horizon Europe's first four years (2021-2024). ETN collected feedback from the members and submitted comments to the European Commission in September. The EU member states will need to decide on the Horizon Europe budget as part of the EU's long-term budget in the upcoming months. The EU leaders will continue the budget discussions during the next European Council meeting in December 2019. ■

Upcoming meetings and events

Meeting/Event	Date	Location
European Utility Week & POWERGEN Europe*	12-14 November 2019	Paris, France
GTSJ International Gas Turbine Congress*	17-22 November 2019	Tokyo, Japan
ETN Project Board meeting	10-11 December 2019	Brussels, Belgium
ETN Board meeting	11-12 December 2019	Brussels, Belgium
ETN Annual General Meeting & Workshop**	18-19 March 2020	Amsterdam, Netherlands
ETN SGT-A35 User Group Meeting	May 2020	To be confirmed
ETN LM2500 User Group Meeting	June 2020	To be confirmed
ETN High-Level User Meeting	13 October 2020	Brussels, Belgium
ETN's 10th International Gas Turbine Conference 2020	14-15 October 2020	Brussels, Belgium

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

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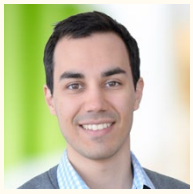

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ETN at a Glance!

Download the ETN Brochure and find out more about our mission & objectives, activities, events and more!

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