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

THE QUARTERLY FOCUS:

ETN Supercritical CO ₂ Working Group)
launched;	
Business case for sCO ₂ Waste Heat	
Recovery System report;	
Meeting calendar	2

INSIDE THE NETWORK:

New members; New Project Board; ETN Networking Coffee Breaks 3

ETN AT WORK:

Virtual User Group Meetings;	
Flexible Power Generation webinar	
series;	
New ROBINSON project starts;	
Virtual IGTC keynote sessions;	
High-Level User Meeting	4 - 5

THE GT INDUSTRY:

Interview with Miguel Patena, EDP Produção

6 - 7

ENERGY POLICIES:

Capacity mechanism for Europear	ł	
lectricity markets: a legislative update;		
rime movers' group on gas quality		
and hydrogen handling;		
EU Commission proposes new 2030		
emission reduction target;		
China to become carbon-neutral		
by 2060;		
ETN joined the European Clean		
Hydrogen Alliance	8 - 9	

THE LIFE OF THE GT COMMUNITY:Upcoming meetings and events10



Christer Björkqvist Managing Director

The importance of virtual networking

With the course of the global pandemic, employees now work virtually together with an ease that few would have thought possible before the outbreak. Even though virtual tools will not replace the full value of face-to-face meetings, the silver lining of the pandemic is the digital transformation of organisations that happened in weeks, not years, which has enabled us to work in a more efficient and cost-effective way.

As travel and attendance to conferences and meetings have currently been taken out of the equation, virtual networking has become of crucial importance to

highlight needs and requirements, exchange information and to ensure progress on research and development activities.

Within ETN we have launched several virtual events and webinars to provide you with focused and productive networking opportunities, like our technical Working Group meetings; webinar series; engine-specific User Group Meetings; keynote panel sessions and virtual Networking Coffee Breaks.

In October ETN will hold its annual High-Level User Meeting that brings together senior management of utilities, oil & gas and industrial users, with a key objective to identify common strategic goals and targets related to future technology and operational needs that will enable a successful energy transition to a carbon-neutral society. Within ETN's Project Board and Working Groups we will subsequently explore technology and cooperation opportunities that can help in defining and developing suitable solutions. I would also like to highlight the recent launch of a new Working Group on Supercritical CO_2 , as a result of a high interest among ETN members in our previous sCO_2 Task Force.

Upcoming meetings in October not to be missed will be our two bridging panel keynote sessions to our postponed International Gas Turbine Conference (IGTC). First out on 15 October will be our user and OEM panel session "Technology needs and developments for a low-carbon society", where ETN's newly elected President Pedro Lopez, Chief Operating Officer – Asset Operations at Uniper, will summarise operational and development needs from the ETN user community, highlighted at ETN's High-Level User Meeting. This will be followed by a panel session with senior executives from major OEMs who will highlight their development plans and latest advancements that will enable a successful energy transition towards a carbon-neutral society.

The second IGTC bridging session "Gas turbines in a carbon-neutral society", taking place on 20 October, will bring together very interesting highlevel speakers from the International Energy Agency, European Commission and US Department of Energy.

With the number of interesting virtual networking meetings and cooperation opportunities within the ETN community, I am sure that we can come out of this pandemic as a stronger and more competitive community.

Finally, I would like to thank the outgoing Project Board members and welcome the newly nominated

ones, and wish the newly launched ETN research and demonstration project "ROBINSON" all success.

HE QUARTERLY FOCUS

ETN Supercritical CO₂ Working Group launched

Following ETN's Technical Committee session on supercritical CO_2 (s CO_2) at our October Workshop in Florence last year, the topic has been of high interest to ETN members. Plans to create a new ETN Working Group were announced during our recent virtual Annual General Meeting and Workshop, and the Supercritical CO_2 Working Group was officially launched this autumn with the following objectives:

Develop, enable and optimise the use of supercritical $\mbox{CO}_{\rm 2}$ power cycles by:

- Highlighting potential use, applications and benefits.
- Paving the way for funding opportunities by highlighting the research needs on sCO₂ based power cycles, to contribute to their deployment in the future energy system
- Addressing operational issues/effects on components (turbomachinery, heat exchangers and combustion systems) related to the use of sCO₂
- Exploring market opportunities
- Assessing and addressing operational safety aspects of sCO₂-cycles based power plants
- Fostering the use of sCO₂ as working fluid for power generation
- Creating a database of European open test beds

ETN sCO₂ Working Group's first teleconference meeting took place in August 2020, and the group is now holding regular teleconferences. More information about the WG activities is available on <u>ETN's website</u>.

Meeting calendar

We have updated our meeting calendar for the end of this year. You can find all scheduled ETN webinars and virtual meetings <u>here</u> – we have many

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ETN webinars & calls alendar for autumn 2020

interesting meetings coming up! The calendar for next year will be published in the January edition of ETN's Quarterly Newsletter.

Business case for sCO₂ Waste Heat Recovery System report published

Business case for sCO₂ Waste Heat Recovery System report

ETN's "Business case for sCO_2 Waste Heat Recovery System" report was published in October 2020. The objective of the business case was to investigate the techno-economic feasibility of a sCO_2 closed loop waste heat recovery system coupled with heavy-industrial processes (e.g. cast-iron, cement production, aluminium production, etc.), which have available flue gases at high temperature (above 400°C).

Industrial facilities release a large amount of heat in the atmosphere as a by-product of their processes. To improve environmental performance and increase the process profitability, a portion of the waste heat can be recovered and employed for power generation by recovery systems.

Supercritical CO₂ systems are emerging as potential alternatives to the well-established technologies for Waste Heat Recovery (WHR) power generation in heavy industry. Such systems are characterised by high performances, reduced footprint, reduced water consumption and they are suitable for a wide range of heat sources.

Currently, technologies such as Organic Rankine Cycles can be applied only to low-medium temperature heat sources, while steam plants cannot be downscaled to be applied in many WHR cases. In this respect, sCO₂ plants could be an interesting alternative to conventional technologies, or a solution for a market share currently underserved.

The full "Business case for sCO₂ Waste Heat Recovery System" report can be downloaded <u>here</u>.

INSIDE THE NETWORK

New members

We are happy to welcome three new members who joined our network: University of South-Eastern Norway, GE Gas Power and Stadtwerke Münster.

University of South-Eastern Norway



Networking Coffee Breaks

ETN will organise a series of virtual "networking coffee breaks" for our members. Each ETN Networking Coffee Break will last 30 minutes and will include one or two short presentations from ETN member organisations about their latest technology developments, introduction to a new project or a topic of interest to the ETN community, followed by discussions with the call participants around the same theme.

Interested organisations are invited to contact the <u>ETN office</u>.

New Project Board

Following the open call for ETN Project Board candidates, the ETN Board has selected the new Project Board for 2020-2022. Our Project Board is responsible for identifying promising technology solutions, new initiatives and projects, based on the user community's needs and policy requirements, as well as ensuring the progress of the ongoing ETN Working Groups and other activities. The new Project Board will hold their first teleconference meeting in November.



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Ansaldo Energia

ETN AT WORK

ETN's virtual User Group Meetings





ETN organised this year's User Group Meetings entirely virtually. The LM2500 User Group Meeting was held on 29 September -1 October 2020, and was supported by GE Aviation, Baker Hughes, Aero Alliance, MTU and

TransCanada Turbines. Our SGT-A35 User Group Meeting took place on 6-8 October 2020, with the support of Siemens Energy, TransCanada Turbines and RWG Repair & Overhauls.

The objective of ETN's User Groups is to create a closer relationship between the user community, OEMs, service

providers and suppliers. During these meetings, focused technical discussions, on the topics of highest importance to the user community, provided an opportunity to present the latest technical developments and to address prioritised topics, collected by ETN through our online platforms dedicated to the LM2500 and SGT-A35 engines.

The ETN office will now follow up on the reported issues and actions coming out of this year's meetings, and will start the preparations for next year's LM2500 and SGT-A35 User Group Meetings by organising regular teleconferences for the user communities of both engines. Any need to cover additional engines will be included in the agenda of ETN's High Level User Meeting that will be held on 13 October 2020. More details on ETN's User Groups are available on our website on the LM2500 and SGT-A35 webpages.

Flexible Power Generation webinar series

In September 2020 ETN launched a new webinar series on Flexible Power Generation. Our first episode, "Challenges and opportunities for flexible power generation in the future energy scenario", was held on 29 September 2020 and gathered over 120 participants.

In the first episode, Hans van Steen, Acting Director Renewables, Research and Innovation, Energy Efficiency (European Commission) presented the EU energy strategy to meet the 2030 and 2050 climate and energy goals. Christer Björkqvist, Managing Director (ETN) highlighted the importance of flexible power generation and contributions that gas turbine technology can provide to the carbon reductions targets and to grid stability in the energy transition and beyond. Simon Balmer, Operations Director – Gas Turbine Fleet (Uniper) provided an end-user perspective of decarbonisation of



the power generation, and Mauro Moretto, Vice President of Technology (Ansaldo Energia) presented the challenges and opportunities for tomorrow's turbomachinery. All presentations are available on <u>our website</u>.

Next episode of the Flexible Power Generation series, "FLEXnCONFU. Power-to-X-to-Power solutions for flexible, carbon-free and efficient energy generation", will take place on 3 November 2020. Registration for this webinar is open to the wider turbomachinery community – see more details on <u>ETN's website</u>.

New ROBINSON project starts

ETN's new EU-funded ROBINSON project started on 1 October 2020. The main goal of ROBINSON ("Smart integration of local energy sources and innovative storage for flexible, secure and cost-efficient energy supply on industrialized islands") is to help decarbonise industrialised islands through the development and deployment of an integrated energy system. The newly developed Energy Management System (EMS) will integrate different components, connecting locally available (renewable) energy sources, electrical and thermal networks, and innovative storage technologies.

This four-year project, with a total budget of 8.37 million euros, involves 18 partners from 10 European countries, ETN being the coordinator of the project. One main pilot demonstrator will be located in Eigerøy (Norway), and two follower islands will be Western Isles (Scotland) and Crete (Greece). You can read more about the project here.

ETN AT WORK

Virtual IGTC keynote sessions

As ETN's International Gas Turbine Conference (IGTC), scheduled to take place in Brussels in October 2020, was postponed to <u>12-13 October 2021</u> due to the COVID-19 pandemic, ETN will now organise two virtual IGTC sessions as "bridging events" ahead of next year's conference.



Gas turbines in a carbon-neutral society

Our virtual keynote session "Gas turbines in a carbon-neutral society – bridging session to IGTC 2021" will be held on 20 October 2020. Speakers of the event will include:

- Mechthild Wörsdörfer, Director, Sustainability, Technology and Outlooks, International Energy Agency
- Tudor Constantinescu, Principal Advisor to the Director for Energy, European Commission
- Robert Schrecengost, Program Manager, Advanced Turbines and Advanced Energy Materials, US Department of Energy

This virtual keynote session will follow the subtitle of our IGTC "Gas turbines in a carbon-neutral society" and cover questions such as:

- The role of gas turbines in a cost-efficient carbon-neutral energy strategy
- Pathways to kick-start a hydrogen economy and key challenges required to be addressed
- International cooperation opportunities

Registration for this session is open through our website.

Technology needs and developments for a low-carbon society

ETN will organise another virtual IGTC session "**Technology needs and developments for a low-carbon society – bridging session to IGTC 2021**" on 15 October 2020. The programme will consist of:

- Report from ETN's High-Level User Meeting: Gas turbine development needs and requirements in the energy transition for utilities, industrial users and the oil & gas community
 - Pedro Lopez, Chief Operating Officer Asset Operations, Uniper
- High-level OEM panel session: Development plans and latest advancements in gas turbine technology towards a carbon-neutral society
 - Paul F. Browning, President & CEO, Mitsubishi Power Americas
 - Luca Maria Rossi, Vice President Technology, Turbomachinery & Process Solutions, Baker Hughes
 - Aad den Elzen, Vice President of Power Generation and Strategic Initiatives, Solar Turbines
 - Brice Raisin, Senior Executive and Commercial Leader Europe, GE Gas Power
 - Thorbjörn Fors, Executive Vice President Industrial Applications, Siemens Energy
 - Daniela Gentile, Executive Vice President Innovation and Quality, Ansaldo Energia

It is still possible to register for this session on our website.

High-Level User Meeting

ETN's virtual High-Level User Meeting "Operational optimisation and technology development needs for the transition to a carbon-neutral society" will be held on 13 October 2020. This invitation-only meeting will be an excellent occasion to exchange views and experiences with senior-level users from the oil & gas, utility and industry sectors, and to bring forward short- and long-term turbomachinery development needs that will have an important impact on the profitability of the operations and the fulfilment of their long-term strategy. Preliminary programme and more details about registration are available here.

A report from the meeting will be presented to the wider ETN community on 15 October during our virtual keynote session *"Technology needs and developments for a low-carbon society"*.



THE GT INDUSTRY

Interview with Miguel Patena, EDP Produção





ETN caught up with Miguel Patena, Director of Innovation, Technology

and International Development of EDP Produção, to hear about EDP's role in our EU funded FLEXnCONFU (FLExibilize combined cycle power plant through power-to-X solutions using non-CONventional Fuels) project that started in April 2020. FLEXnCONFU is part of EDP's strategy in search for low-carbon generation solutions from an energy perspective, that will simultaneously pass through the electrification of the consumption and production of non-carbon fuels reducing the greenhouse effect. Hydrogen can play a decisive and sustainable role in the new world of energy. It can be a solution for the so-called last mile of decarbonisation.

Could you tell us what EDP's role in the FLEXnCONFU project is?

EDP Produção, the generation company of EDP Group, together with CNET, our R&D company, leads the demonstration of a power-to-hydrogen system (P2H) in a real operational environment.

A complete system, composed of a 1 MW fast-cycling electrolyser, gas compressor and pressurised hydrogen storage, will be installed for demonstration plant of a power-to-hydrogen system (P2H) at EDP's Ribatejo power plant in Portugal.

Ribatejo power plant is a combined cycle power plant located by the Tejo river, about 30 km northeast of Lisbon, in Carregado village. With a total installed capacity of 1.176 MWe (net), this combined cycle gas turbine (CCGT) power plant comprises three similar and independent units, each one generating 392 MWe (net). The units 1 and 2 were commissioned in 2004 and the last one (Unit 3) in 2005. The fuel is natural gas.

EDP is involved in FLEXnCONFU's all activities related to the development and integration of P2H system in the existing power plant: definition of layout; design of balance of plant and integration in the P2H; supporting the development and integration of P2H, the health and safety procedures for demonstration plant and potential upscale, and the control strategy development and integration; and installation, commissioning, start-up, monitoring and operational test results of P2H demonstration plant.

EDP Produção is also involved in other activities, such as the evaluation of the impact on the design of combustion chamber for hydrogen combustion and necessary protections; supporting the activities related to the balance of plant innovations, control and dynamics; the scale-up of FLEXnCONFU concept P2H; the investigation of other uses for H₂ and O2

to enhance the P2H potential and profitability; the regulatory and non-technical framework analysis; the flexibility analysis needs and comparison between FLEXnCONFU and other flexibility assets; and the LCA/LCC assessment and dissemination activities.

Why is FLEXnCONFU an important project?

Hydrogen is part of EDP's strategic roadmap towards decarbonisation of our portfolio, while contributing to meeting the Portuguese and the EU objectives. EDP aims to reach 70% of carbon-free portfolio by 2022, and more than 90% before 2030. Although the most efficient way to decarbonise is through electrification, there are some sectors where this is not possible or not economically feasible.

Also, with the 2030 goals, the EU is strongly pushing towards renewable energy sources (RES), as well as alternative fuels to increase fuel independency. Achieving this goal is only possible with a strong integration between dispatchable (power plant) and RES energy sources. CCGT plant will be, for the next years, a good flexibility source for compensating the intermittency of the RES. The injection of alternative fuels (i.e. H_2 and NH3) will help the current "fuel switch" the EU is facing, drastically reducing the greenhouse gas (GHG) emissions. The P2X solutions, which are currently widely studied, coupled with RES, could help the combined cycle power plant to levelling their load reducing its environmental impact. Hence, developing proper technologies and solutions to couple power-to-X-to-power (P2X2P) systems with gas turbines is mandatory.

FLEXnCONFU aims to respond to the challenge arising nowadays for fossil fuel power plants, which must shift their role from providing base-load power to providing fluctuating back-up power. The strong fluctuations will not only reduce

continued on page 7

6

THE GT INDUSTRY



the operating life of the plants' components but also reduce the efficiency and increase the GHG emissions. The project will explore innovative power-to-gas-to-power solutions, which would allow a less fluctuating operation of the power plants while producing non-carbon fuels (e.g. hydrogen, ammonia) to burn in the same power plant reducing the GHG emissions.

FLEXnCONFU is a pioneer "demonstration-to-market" project which will contribute to the valorisation of European GT and power-to-gas (P2G) scientific and technological competencies, and to the creation of a clean hydrogen/ammonia society.

What are the FLEXnCONFU project's targets?

The first objective of FLEXnCONFU consists of increasing the combined cycle operating flexibility based on an innovative balance of plant that could be applied to any GT independently from the GT OEM.

The focus will be to develop an energy system with the following measurable targets:

- reduction of minimum load (-10%)
- reduction of NG consumption and related emissions (-10/20% of GHGeq)
- increase in annual power plant average efficiency (+5%)
- increase yearly Equivalent Operating Hours (5/10%)
- reduction of yearly start-up numbers (- 10%)
- fast ramp up/down with load gradient (+10/15%)

The demonstration plant, to be installed in Ribatejo CCGT, will test only 1% hydrogen injection in one of our gas turbines, so no quantifiable gains will be attained. The demo plant will be used to extrapolate the overall gains expected in a large-scale hydrogen injection plant.



Nevertheless, the system will be tested and analysed at several loads and power ramps, with the aim of characterising the whole operational envelop and understanding the plant limits. Flexibility of the FLEXnCONFU system will be stressed, and important parameters, such as overall efficiencies and load variation times, will be collected as trigger parameters for the scale-up phase.

Beyond the main objective of developing new power-to-X-topower solutions integrated in combined cycle thermal power plants and in dedicated turbines for burning hydrogen and ammonia, the project also intends to study cross-vector integration, such as industrial use and mobility use of heavy trucks. The solution of injection of hydrogen in the natural gas pipelines in order to gain economies of scale in generation, transportation and hydrogen distribution will also be studied.

Through an in-depth analysis of the supply chain the most favourable applications and business models to achieve carbon-neutral targets by 2050 will be explored.

Why do we need flexible power generation and hydrogen?

To reach the EU objectives of decarbonisation before 2050, we must integrate two important energy vectors: electrification and green fuels. In this case, green hydrogen will be essential for decarbonising what we call the "last mile", sectors that cannot be decarbonised only by electrification. Generating green electricity with RES and producing hydrogen with the excess power of these systems will provide an integrated green energy solution and a way to optimise the use of RES.

Hydrogen is a clear option for implementing in the new world of energy, and EDP is continuously evaluating and testing potential alternatives for energy production. Our commitment to R&D in the hydrogen area, based on electrolysis, is made with the ambition to find alternative, better, and more sustainable business models.





This project has received funds from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 884157.

ENERGY POLICIES

Capacity mechanism for European electricity markets: a legislative update

Among all the changes happened in 2020, maybe one has passed unnoticed or barely noticed. More precisely, as of 1 January 2020 the European Union's <u>Regulation on internal</u> <u>market for electricity (EU) 2019/943</u> (also known as Electricity Regulation) replaced the old Electricity Regulation (EC/714/2009) that was in place for over 10 years.

What is an EU regulation?

A "regulation" is a binding legislative act and it must be applied in its entirety across the EU. Other acts from the European Union encompass Directives, Decisions, Recommendations and Opinions. Please <u>click here</u> if you want to know more about the different acts.

The new Electricity Regulation introduces several changes, which are affecting the capacity mechanisms for electricity markets (e.g. it introduces a new limit for powerplants eligible to receive subsidies as capacity mechanisms, confirming the phasing out of subsidies to generation capacity emitting 550gr CO₂/kWh or more).

But, first of all, what are capacity mechanisms? A capacity mechanism is a tool that enables power plants to be available for generating electricity when needed in exchange of payments. These capacity payments are in addition to the earnings power plants gain by selling electricity on the power market. For its own nature, a system that integrates a capacity mechanism (and therefore capacity payments) could cause distortions to the EU's Internal Electricity Market, where it coexists with systems that rely solely on earnings from sales.

Therefore, it has always been of capital importance that capacity mechanisms are introduced only when necessary and that they are designed to minimise impact on the market. On top of that, it is made clear that capacity mechanisms should be introduced as a last resort option only, they should be temporary and they "shall be approved by the European Commission for no longer than 10 years" [(EU) 2019/943, article 21(8)].

The most relevant articles regarding the capacity mechanism are encompassed in Chapter 4 "Resource adequacy" (articles from 20 to 27) of the new Electricity Regulation (EU) 2019/943.

Amongst others, new requirements regarding CO₂ emissions limits are introduced [article 22(4)]:

 (a) from 4 July 2019 at the latest, generation capacity that started commercial production on or after that date and that emits more than 550 g of CO₂ of fossil fuel origin per kWh of electricity shall not be committed or to receive payments or commitments for future payments under a capacity mechanism;

- (b) from 1 July 2025 at the latest, generation capacity that started commercial production before 4 July 2019 and that emits more than 550 g of CO₂ of fossil fuel origin per kWh of electricity and more than 350 kg CO₂ of fossil fuel origin on average per year per installed kWe shall not be committed or receive payments or commitments for future payments under a capacity mechanism.
- The emission limit of 550 g CO₂ of fossil fuel origin per kWh of electricity and the limit of 350 kg CO₂ of fossil fuel origin on average per year per installed kWe referred to in points (a) and (b) of the first subparagraph shall be calculated on the basis of the design efficiency of the generation unit meaning the net efficiency at nominal capacity under the relevant standards provided for by the International Organization for Standardization.

And, (EU) 2019/943, article 22(5)

 Member States that apply capacity mechanisms on 4 July 2019 shall adapt their mechanisms to comply with Chapter 4 without prejudice to commitments or contracts concluded by 31 December 2019.



The technical details on emissions calculation can be found in the European Union Agency for the Cooperation of Energy Regulators' (ACER) <u>publication</u> [Opinion No 22/2019 of 17 December 2019 on the calculation of the values of CO_2 emission limits referred to the first subparagraph of Article 22(4) of Regulation (EU) 2019/943 of 5 June 2019 on the internal market of electricity (recast)].

EU member states that want to use capacity mechanisms must submit implementation plans to the European Commission for review. If the European Commission deems it necessary, it could ask for amendments. All the national implementation plans, as well as the Commission's opinions, can be found <u>here</u>.

8

Prime movers' group on gas quality and hydrogen handling

In a systemic approach to decarbonise the gas grid in a costeffective manner, the European Network of Transmission System Operators for Gas (ENTSOG), together with several distribution system operator (DSO) organisations, have established a dedicated prime movers' group on gas quality aspects for stakeholders of the gas value chain. This <u>newly launched</u> group will discuss the development of innovative and feasible ways to handle gas quality in fluctuating blends, as well as pure hydrogen grids in the future gas system, and the main technical challenges foreseen.

The aim is to collaborate on the main principles to handle gas quality related to renewable, decarbonised and low-carbon gases that can optimise the diversification of supplies, decarbonisation of the grid and guarantee end-user safety and access to the product they require. More details are available <u>here</u>.

ETN attended the virtual kick-off meeting in September and will follow the activities of this group, reporting about the outcomes to the ETN members and providing them the opportunity to submit comments on the discussed topics.

China to become carbon-neutral by 2060

China made a surprise move at United Nations' virtual <u>General Assembly</u> in September when President Xi Jinping announced the country's plans to have a "CO₂ emissions peak before 2030 and achieve carbon neutrality before 2060". This announcement by China, the world's largest emitter of carbon dioxide, was hailed by the EU leaders and environmental groups, although China's detailed plans for reaching the target were not yet revealed. More information is expected to be available in the coming months, as the 14th Five-Year Plan period (2021-2025) will start next year, and the associated plans for energy should be announced prior to this.

EU Commission proposes new 2030 emission reduction target



In her first <u>State of the Union</u> speech in September 2020, the European Commission President Ursula von der Leyen presented the Commission's plan to reduce EU greenhouse gas emissions from the current 40% to "at least 55%" by 2030, compared to 1990 levels. The target is based on the Commission's <u>impact assessment</u> that was carried out during the past year.

The European Commission's Green Deal, presented in December 2019, lists several climate and energy related legislation to be reviewed, such as the EU Emissions Trading System (EU ETS), and the Renewable Energy and Energy Efficiency Directives. The European Commission will present its legislative proposals by June 2021, in line with the proposed 2030 target. In the meantime, the European Parliament and the Council of the EU will need to agree on the new 2030 target.

The EU might also need to revise its nationally determined contributions to reducing emissions under the Paris Agreement. This year's UN climate change conference COP26 was postponed to 2021 due to COVID-19, and will be held in Glasgow, UK, in November 2021, which means that the EU countries will have more time to agree on more ambitious emission reduction targets ahead of the conference.

ETN joined the European Clean Hydrogen Alliance

The European Clean Hydrogen Alliance, which brings together industry, national and local public authorities, civil society and other stakeholders, aims to establish an investment agenda and support the scaling up of the hydrogen value chain across Europe. It is open to all public and priEuropean Clean Hydrogen Alliance



vate actors with activities for renewable or low-carbon hydrogen. ETN joined the alliance in August and will monitor the developments within this network, reporting about activities of interest to the ETN members.

Upcoming meetings and events

Meeting/Event	Date	Location
ETN High-Level User Meeting**	13 October 2020	Virtual meeting
Technology needs and developments for a low-carbon society – bridging session to IGTC 2021**	15 October 2020	Virtual meeting
Gas turbines in a carbon-neutral society – bridging session to IGTC 2021**	20 October 2020	Virtual meeting
Flexible Power Generation webinar: 2 nd episode	3 November 2020	Virtual meeting
Flexible Power Generation webinar: 3 rd episode	1 December 2020	Virtual meeting
ETN's 10 th International Gas Turbine Conference*	12-13 October 2021	Brussels, Belgium

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

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ETN at a Glance!

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



Are you interested to become an ETN member? Download the one-pager showcasing the benefits of being part of ETN's global turbomachinery community.





Keep in contact and updated with ETN's most recent news. Follow ETN on Twitter: @etngasturbine and on LinkedIn!



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