ETN NEWS

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ETN Global is a non-profit association bringing together the entire value chain of the gas turbine technology community. Through cooperative efforts and by initiating common activities and projects, ETN encourages and facilitates information exchange and cooperation to accelerate research, development, demonstration, and deployment of safe, secure and affordable carbon-neutral energy solutions by 2030.

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Christer Björkqvist
Managing Director

A strategy and roadmap for a successful energy transition is taking shape

In early spring 2020 we were all stroke by the shock of the COVID-19 pandemic but, with a determination not to get paralysed, a focused and efficient digital transformation took place that enabled a continued cooperation towards the common goal of establishing gas turbine technology as a key enabler in the energy transition to a carbon-neutral society.

On a global scale more and more countries are lining up around the carbon neutrality goal by mid-century. 120 countries have now announced their commitment to this goal, and since China's carbon neutrality pledge by President Xi, and President Biden's executive order to reverse the Trump administration's decision and re-join the Paris Agreement, almost two thirds of the world's emissions are in countries with a common decarbonisation vision and timeframe. It is true that a commitment can be empty words if not backed by a clear plan of action. As strategies and roadmaps of future energy solutions are being developed by these countries and industries, it is vital to highlight development opportunities and demonstrate the valuable contributions that our technology can provide in the decarbonisation process, to be fully considered.

Within ETN, the new leadership is doing their part and progress is already being made. With the widening of the ETN Board and Project Board, now with all stakeholders represented, we are in a strong position to develop a common strategy and roadmap for a successful collaboration and technology development in the energy transition to 2030. As a starting point the gas turbine user community highlighted their technology needs and requirements at ETN's High-Level User Meeting that took place virtually in mid-October 2020. It was emphasised that ETN user community strongly believes that gas turbines will have an important role in the energy transition, and that efficient and environmentally sound dispatchable energy solutions will become a cornerstone of future decarbonised energy systems.

During our October "bridging session" to ETN's International Gas Turbine Conference 2021, senior executive OEM panelists responded in a very positive way to the users' requests. However, they also pointed out that a stable and acceptable legal framework is required, together with supportive R&D programmes. This is where ETN can play an important role as an advocacy platform for policy and legislative issues, and as a coordination and collaboration platform to accelerate research and development of relevant energy solutions. Two new R&D projects have taken off from the ETN platform in 2020, and at least one additional will start in 2021.

The ETN Board and Project Board are now in preparation of a revised strategy and drafting our new R&D Recommendation Report that will be presented to ETN's General Assembly at our Annual General Meeting on 15 March 2021.

For the start of 2021, we will continue with our virtual programme of activities, and our AGM & Workshop Week in March will be held virtually, but we are monitoring closely the course of the pandemic, company restrictions and health & safety recommendations, as we are eager to meet face-to-face again.
We have strong hopes to be able to come together and celebrate the 10th anniversary of our International Gas Turbine Conference on 12-13 October 2021.

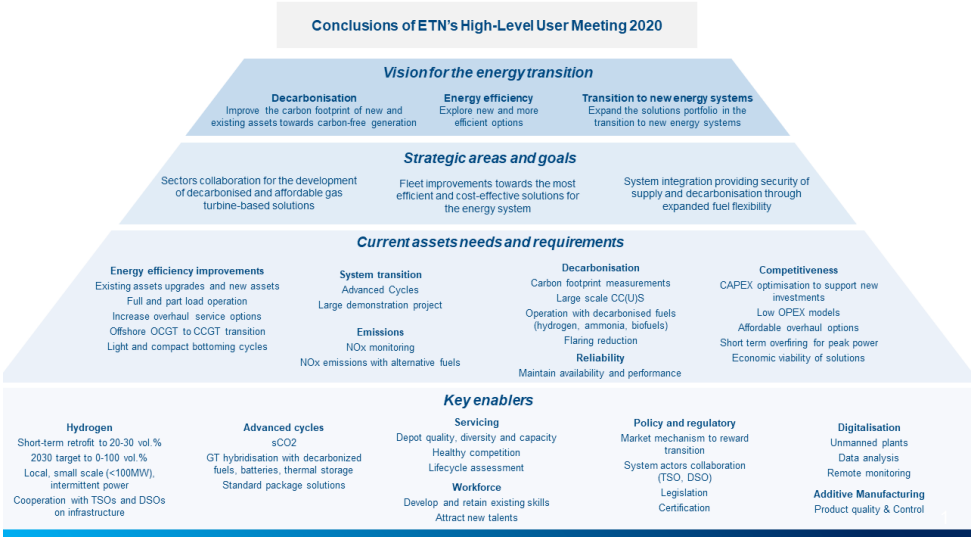
ETN users: "*Gas turbines will have an important role in the energy transition*"

ETN's High-Level User Meeting *"Operational optimisation and technology development needs for the transition to a carbon-neutral society"* took place virtually on 13 October 2020, and was very well attended by the utilities and oil & gas companies. As the decarbonisation trend has accelerated, it has become a key priority for all ETN users, requiring high efficiency and low-carbon fuel flexibility with carbon-neutral solutions available by 2030.

Key messages from the user community

- Ambitious decarbonisation targets are adopted, or are in the process of being adopted, by ETN users' corporate strategies, with different target time horizons ranging from 2030 to 2050 to achieve carbon-neutrality.
- Many decarbonisation options (ranging from partial decarbonisation to full decarbonisation) for gas turbines are possible, but viability will depend on different local application factors, technical barriers and regulatory framework.
- Hydrogen is perceived as a potential key decarbonisation enabler, which would require adaptations ranging from 0 to 100 vol.% towards 2030.
- ETN users believe that gas turbines are playing a key role today, gaining relevance in the coming years, as other dispatchable technologies are phased out (e.g. coal and nuclear in different countries), with reliability, operational competitiveness, digitalisation and emissions reductions as key drivers.
- ETN users strongly believe that gas turbines will have an important role in the energy transition, and that turbine-based solutions are a cornerstone technology in the decarbonisation of the energy systems.
- The above requires coordinated intervention and collaboration between the different actors to shape the regulatory framework to secure sustainable long-term future of the gas turbine industry.

ETN's users call OEMs and the R&D community to join forces, contribute and continue enabling cost-efficient operations of the current asset base, while investing in solutions to respond to the decarbonisation challenge. ■



IGTC International Gas Turbine Conference

Virtual IGTC keynote sessions

As ETN's International Gas Turbine Conference (IGTC) was postponed to October 2021 due to COVID-19, ETN organised two virtual IGTC keynote sessions as "bridging events" ahead of next year's conference.

ETN President Pedro Lopez presented the key messages from the ETN user community during the first IGTC session "*Technology needs and developments for a low-carbon society*" on 15 October 2020. The OEM panelists acknowledged the users' requests and delivered a very clear message: the OEMs are committed and prepared to do the required investments to enable these requests. However, this will require a stable legal framework, as well as supportive development and cooperation programmes. All presentations from this session are available for ETN members on our website.

During the second session "*Gas turbines in a carbon-neutral society*" on 20 October, an introduction presentation by the IEA provided the latest global energy outlook and policy requirements for a sustainable energy transition to a carbon-neutral society, followed by the presentations and discussions on the EU and US hydrogen strategies and supportive programmes. Presentations from this session can be accessed here. ■

New members

We are pleased to welcome four new members who joined our network: ADNOC (United Arab Emirates), Finno Exergy (Finland), Rey Juan Carlos University (Spain) and Politecnico di Milano (Italy).

We look forward to meeting our new members at our upcoming events.

ADNOC

Finno Exergy

Rey Juan Carlos University

Politecnico di Milano

OEM representation in the ETN Board

Two OEM representatives joined the ETN Board of Directors in October 2020. Paul F. Browning, Chief Regional Officer Europe, Africa, Middle East and Americas at Mitsubishi Power, and Uwe Kaltwasser, Regional Project Development Manager at Siemens Energy, were elected by ETN's General Assembly, and will serve the ETN Board for 2020-2022. This is a historic moment for ETN, as for the first time all different stakeholders are represented in the ETN Board. With this step we aim to create an even closer relationship and enhance cooperation between the user community, OEMs, academia, suppliers and service providers, benefiting the whole value chain. ■

"As we undergo a period of rapid change, the combustion turbine will continue to play a central role in decarbonizing power generation, while also playing a new role in storing renewable power in Europe and around the world. I'm excited to join the ETN Board and to collaborate with customers and colleagues during this dynamic time when the world is depending on continued progress in combustion turbine technology."

Paul F. Browning
Chief Regional Officer Europe, Africa, Middle East and Americas
Mitsubishi Power

"In these times, which are challenging for the energy sector, I am a strong believer in gas turbine technology opportunities. I am honored to become a member of ETN's Board. Representing an OEM on the board, I feel obliged to listen carefully to the Gas Turbine Users as they are the ones who have to make the right decisions on the way to a carbon-neutral future. I am excited to be part of ETN, a unique forum to facilitate the energy system transformation. Within this forum, we have excellent know-how with members such as Universities, Research Institutes, Suppliers, and also the OEMs, who are supporting the Users with technical expertise."

Uwe Kaltwasser
Regional Project Development Manager
Siemens Energy

"Having OEM representatives in the Board is an important step that confirms that the whole gas turbine value chain is committed to take cooperation to another level. I am sure that Paul Browning and Uwe Kaltwasser will provide valuable contributions to the development of an ETN strategy that will shape the future of the gas turbine industry and enable innovative cost-efficient decarbonisation solutions. As the President of ETN I welcome them to the ETN Board who are eager to start this exciting journey with them."

Pedro Lopez
Chief Operating Officer – Asset Operations
Uniper / ETN President

Flexible Power Generation webinars

In September 2020 ETN launched our new popular webinar series on Flexible Power Generation. These webinars have proven to be an excellent way to share information about ongoing research projects within the wider gas turbine community, providing an opportunity for the project partners to disseminate interesting results and share views with the audience.

Next episode

Our next episode "*sCO2-flex. Adaptation of fossil-fuel power plants to the future energy system requirements*" will take place on 2 February 2021. Registration for this webinar is still open – sign up here.

Previous episodes

Full recordings and all webinar presentations are available on ETN's website – please click the links below:

- 1st episode: Opening of the webinar series
- 2nd episode: FLEXnCONFU project
- 3rd episode: HYFLEXPOWER project
- 4th episode: PUMP-HEAT project ■

Save the date for ETN's AGM & Workshop

ETN's virtual Annual General Meeting (AGM) & Workshop Week will take place in March – make sure to mark your calendar:

- AGM: 15 March 2021 (14:00-16:00 CET)
- Workshop sessions: 16-19 March 2021 (14:00-16:00 CET)
- AGM & Workshop closing session: 22 March 2021 (14:00-16:00 CET)

Registration will be open at the end of January. More information will be updated to our website shortly. ■

New website features

During the last few years ETN has published several interesting R&D reports and publications, covering topics such as micro gas turbines, digitalisation, additive manufacturing, hydrogen and supercritical CO_2. We have now made these publications more easily accessible through our website. You can find all of them here.

We have also published a new calendar on our website which lists the confirmed meetings and events for 2021, and which will be updated regularly – take a look here. ■

Interview with Agustin Valera-Medina, Cardiff University

The FLEXnCONFU project explores the potentialities of using non-conventional fuels in gas turbine combined cycle power plants for flexibility needs and higher environmental sustainability. In this context the test campaign that will be conducted at Cardiff University's combustion laboratories in the UK, with different blends of ammonia, methane and hydrogen, will allow a deeper understanding of the modifications required on the gas turbines for ammonia and hydrogen combustion. ETN interviewed Agustin Valera-Medina, Associate Professor in Thermofluids and Combustion Dynamics at Cardiff University, who tells us about Cardiff University's work in the FLEXnCONFU project.

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

We are leading the combustion work package of the project. When we were approached to join the project consortium, we immediately recognised that our expertise with ammonia and hydrogen would be suitable for the project's requirements. The short story goes back to the visit of some industrial companies a few years ago. They had the intention of running engines and gas turbines with ammonia. It is funny to say that at the time, most people were extremely skeptical about this concept. However, our research is now presenting ammonia as a real fuel candidate for medium and large power applications.

In our role, the Cardiff University will be looking into different ammonia/hydrogen/methane blends to evaluate their feasibility in gas turbine combustion systems. From analyses of flame stability and operability regimes, to the understanding of combustion and chemical features, we will evaluate various blends at ambient and pressurised, high inlet temperature conditions. Emissions, radical formation, temperature profiles, operability maps, and flame stability will all be assessed in large experimental campaigns based on generic swirl burners representative of the gas turbine industry. The use of non-intrusive techniques in combination with bespoke analysers located in our facilities at Port Talbot, GTRC, and Cardiff University, will serve for accurate results that can be used in other work packages of the project. These results will support the improvement of numerical models for better designs, whilst ensuring that the data is also of value for future projects and development of more accurate reaction mechanisms.

> **"Ammonia and hydrogen are two energy vectors that came to form part of our energy future."**

What role could hydrogen and ammonia combustion play in the energy transition?

Currently ammonia is positioning itself as a major energy vector across the great variety of electrofuels available in the market. Interestingly, this ammonia, product of the generation of green hydrogen via electrolysis, now presents a real, commercial possibility for storing renewable energy and transporting it over long distances. Large projects across the globe are now targeting the production of green ammonia from wind and solar energy, enabling the distribution of stranded energy to locations where energy consumption is considerable and large concentration of renewable sources are scarce. To give you an example, Australia is now moving in a direction to supply more than 13GW power to South Asia and Japan using ammonia from renewable sources. The project is in direct competition with other larger programmes such as those of the Neom city in Saudi Arabia, where an investment of ~$50B US has been released for decarbonisation of the chemical sector. Similarly, the US, Spain, Norway, Germany, etc. are looking into the concept, with the possibility of many other regions across the planet to use it for large commercial purposes. Therefore, ammonia and hydrogen will make an exciting combination for the energy portfolio in the near future. A combination of both molecules will enable flexible storage and distribution with clean energy release.

What are the challenges to be overcome for the combustion of hydrogen and ammonia in gas turbines?

When it comes to stability, ammonia and hydrogen blends are very stable since the higher reactivity and diffusivity of hydrogen gets compensated by the slow reacting nature of ammonia. However, due to the nitrogen bounded to the ammonia molecule, the reaction of these blends tends to produce large

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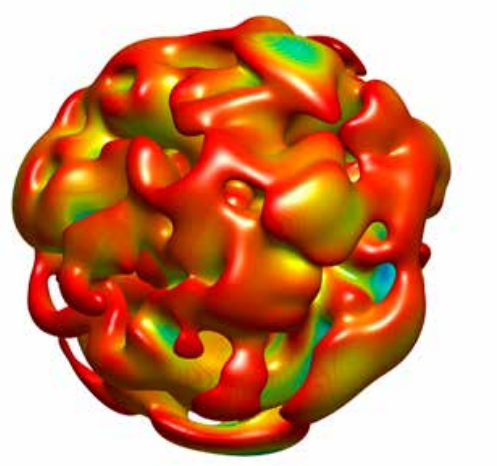

Recent results using DNS for hydrogen flames (Eindhoven University of Technology)

NO concentrations at the exhaust. This problem is also linked to potential unburned ammonia that can slip the system, thus increasing problems at ground level (i.e. particle matter) or higher atmospheric layers (i.e. acid rain). Further, NO can also keep reacting, leading to N2O, a highly powerful greenhouse gas. However, some of the research we are conducting through FLEXnCONFU is targeting new methods of injection and best blends to reduce the production of these unwanted emissions. The high stability that we are observing is paramount to use the concept in larger units. It is predicted by many forecast agencies and governmental bodies, that if technology keeps its progress, we will see MWs units running on ammonia/hydrogen blends in just a few years, with expectations of commissioning the first 100 MW systems by the end of the decade. These will need, of course, to have novel systems to handle the use of ammonia/hydrogen blends, integration of components, novel cycles and health and safety philosophies that have not been conceived yet. All a great challenge.

What are the phases of the combustion campaign?

We have started looking into the update of a gas turbine located at the University of Genoa in Italy. The aim is to fire it using large concentrations of hydrogen and even pure ammonia. This task is directly linked to inform our EDP partners on the use of these blends, so they can start works around the retrofitting of some of their power units located in Ribatejo, Portugal. Simultaneously, the work will be fed by fundamental research which will enable more complex numerical models for improvement of these ammonia/hydrogen combustors. The models will be validated in facilities located at the University of Orleans (France) and at Cardiff University's laboratories. It is expected that by the end of the project, the consortium will have a reliable technology, unique in Europe, with the buildup of essential knowhow for the reconversion of larger power plants across the continent.

What are FLEXnCONFU's targets related to the use of non-conventional fuels?

We expect to have some micro gas turbines fully running on electrofuels (i.e. hydrogen and ammonia from electrolysis), whilst the rest of the works in our work package will set the foundations for the retrofitting of larger units to enable the use of these gases. Successful outputs will be measured against the development of novel technologies, the creation of essential knowhow, consolidation of a strong consortia that will seek further projects for the use of ammonia/hydrogen blends across the continent, and the re-assurance that ammonia and hydrogen are two energy vectors that came to form part of our energy future. ■

Recent ammonia/hydrogen/methane experiments (Cardiff University)

www.flexnconfu.eu

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Subscribe to our FLEXnCONFU newsletter **here**

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

New ROBINSON project focuses on innovation for clean energy on islands

Islands often find it challenging to ensure a clean, secure and cost-effective supply of energy. The key is to decrease dependency on fossil fuels and become energy self-sufficient through a mix of renewable energy generation and storage infrastructure. To support islands in their quest to decarbonisation, the European Union's Horizon 2020 Research and Innovation Programme funded a new ROBINSON project, which is coordinated by ETN and involves 18 partners from 10 countries. ETN's Research and Innovation Manager and ROBINSON project coordinator Ugo Simeoni explains the project and its background.

What is the main goal of ROBINSON?

ROBINSON's main mission is to develop an integrated energy system to help decarbonise islands. Its newly developed Energy Management System (EMS) will couple locally available energy sources with innovative energy and storage technologies across different energy vectors (electricity, gas, and heat). This integrated system will ensure a reliable, cost-efficient, and resilient energy supply, contributing to the decarbonisation of the European islands by helping to decrease CO_2 emissions. ROBINSON's energy system will be demonstrated in real-life conditions on Eigerøy, an island off the southwestern coast of Norway. Replication studies will be conducted for Crete (Greece) and the Western Isles (United Kingdom), ensuring flexibility and further replicability. User-friendliness and modularity of the system will facilitate replication to other energy islands with similar conditions.

What are the key elements of ROBINSON?

Technological innovation plays a pivotal role in ROBINSON. With a general technological knowledge brought to the partners assessed at technology readiness level (TRL) 5, several technologies will reach TRL 7 by fulfilling the objectives of the project. ROBINSON will invest significantly in developing, testing, adapting and making market-ready key technologies that will support Europe in its energy transition.

For example, ROBINSON's EMS will ensure an efficient and smart integration of all distributed energy resources (DER), energy surpluses, and storage capacities available on the island, while considering demand-side response, power balancing, weather forecast and market-related costs.

But the innovative potential of ROBINSON does not end at the EMS: several different energy and storage technologies will be installed and demonstrated in a pilot plant on Eigerøy (area of Kaupanes), on the site of Prima Protein.

ROBINSON's system will integrate hydrogen-related technologies (electrolyser and storage system), an anaerobic digester assisted by bio-electrochemical systems to enable the conversion of liquid waste into biomethane, a gasifier to convert bio-waste, an innovative wind turbine, a small gas turbine based combined heat and power, as well as local renewable energy sources such as solar PVs.

Finally, these technologies can further be applied to other sectors such as microgrids, residential and ROBINSON municipality buildings, energy intensive industries, electrified harbours, and cleaner road transport.

What are the objectives of ROBINSON?

To support a whole community in its strive for decarbonisation and emissions reduction requires a broad spectrum of expertise and a comprehensive approach. From the development, optimisation and validation of new innovative technologies, to large-scale applicability, from the replicability of the system, to positive impact on the environment and on the human health, every aspect of ROBINSON is structured so to help islands achieve their decarbonisation goals, while contributing to Europe's technological advancement, improving quality of life, protecting the environment, and being cost-competitive and market-ready.

ROBINSON's key objectives are:

- Develop and validate a modular and flexible Energy Management System integrating different energy vectors
- Optimise, validate and integrate innovative technologies for energy & heat production, and for long-term energy storage
- Demonstrate large-scale applicability and replicability of the ROBINSON system
- Have a positive impact on human health and on the environment
- Be cost-competitive when benchmarked against potential alternative technologies

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What are ROBINSON's expected impacts?

Surely one of the most relevant expected impacts is to accelerate the decarbonisation of islands through reduction of fossil fuel consumption, increased efficiency, better integration of renewable energy sources, and waste valorisation. Moreover, thanks to the use of hydrogen as an energy carrier, ROBINSON will increase the system flexibility in terms of peaks shaving in energy production and demand, decoupling the electricity and thermal power values, and balancing different ramp rates of components in the energy system.

The specific ROBINSON energy systems and their different component will also increase network stability and the security of energy supply thanks to long-term storage, smart integration of energy sources across different energy vectors, and reduction of energy waste.

ROBINSON aims also to offer a concrete solution for decarbonisation for (industrialised) geographical islands, landlocked islands and remote locations of Europe and worldwide; the high flexibility and modularity of the system and the integration of several technologies will facilitate the replicability on energy islands with similar needs, while decreasing potential costs (e.g. carbon taxes, investments for new cable connections, etc.).

Last but not least, ROBINSON is developed with the community and for the community; the involvement of local stakeholders and an increase of (local) economic opportunities are also to be expected.

Any last comments?

There are no silver bullets for decarbonisation of islands: each island has its own unique characteristics related to the RES penetration, weather and geographical conditions, population, tourism, distance from mainland and presence of industries. Thanks to ROBINSON, each unique trait of the island can become its strength and being integrated in a comprehensive system that aims at increasing economic opportunities, broadening the technology market, reducing emissions, and empowering local communities and industries. ■

Project details

Project Grant Agreement:	957752
Start date:	1 October 2020
Project duration:	48 months
Project budget:	€8,369,532.50
Project coordinator:	Ugo Simeoni, ETN
Info:	info@robinson-h2020.eu

Project partners

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This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 957752.

The European Green Deal: one year after

In December 2019, the European Commission President Ursula von der Leyen presented the European Green Deal, EU's new strategy for sustainable growth. The European Green Deal aims at transitioning to a climate-neutral Europe by 2050 in a just and inclusive way. Covering all sectors of the economy, it provides a roadmap of actions to reach these goals. With about 50 different actions listed in the 2019 roadmap, mid-term goals to 2030 and longer-term goals to 2050, ETN sums up where we stand, what has already been delivered, and what we should expect in 2021.

The European Green Deal: status quo

Despite the disruption caused by the COVID-19 pandemic, the European Commission has delivered several pieces of the European Green Deal throughout 2020. With a strong focus on the energy sector, 2020 saw the publication of several key documents:

- The EU strategy on energy system integration provides the framework for the green energy transition. It aims to reform the European energy system through a more efficient and integrated system linking various energy sources and carriers with each other and with infrastructures and end-users.
- The EU Hydrogen strategy for a climate neutral Europe highlights a phased approach to untap the potential of hydrogen to support the decarbonisation of sectors like transport, power generation, and hard-to-decarbonise industries. 2020 also saw the launch of the Clean Hydrogen Alliance, which ETN joined last year.
- Proposal for a European Climate Law aims at setting into legislative form the European Green Deal's goals. It aims to ensure that all EU policies contribute to these goals and that all sectors of the economy and society play their part.
- The EU Strategy to reduce methane emissions presents a set of (legislative and non-legislative) actions to cut methane emissions in Europe and worldwide in order to achieve EU's 2030 and 2050 climate targets.

These are just few of the documents released throughout the year. Other publications include the European Green Deal Investment Plan; the Just Transition Mechanism; the European Industrial Strategy; the Farm to Fork Strategy; the Circular Economy Action Plan; the EU Biodiversity strategy for 2030; the 2030 Climate Target Plan; the Renovation wave; the Chemicals Strategy for Sustainability; the Offshore Renewable Energy; the European Climate Pact; and the European Battery Alliance.

2021: a crucial year

During the latest European Council meeting in December 2020, the EU leaders reached an agreement to cut the EU greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels, an increase from the earlier 40% reduction target. For the European Green Deal, 2021 is the year of the "Fit for 55" package (referring to the 55% reduction target by 2030). The "Fit for 55" is a broad, comprehensive policy framework that will complement the work done in 2020.

The legislative peak is expected in June 2021, when the European Commission will release the proposals for revision of several relevant legislative measures. In particular, the following initiatives are announced for the second quarter of 2021:

- Revision of the EU Emissions Trading System (ETS), including maritime, aviation and CORSIA, as well as a proposal for ETS as own resource
- Carbon Border Adjustment Mechanism (CBAM) and a proposal for CBAM as own resource
- Effort Sharing Regulation (ESR)
- Revision of the Energy Tax Directive
- Amendment to the Renewable Energy Directive (RED) to implement the ambition of the new 2030 climate target
- Amendment of the Energy Efficiency Directive to implement the ambition of the new 2030 climate target (EED)
- Reducing methane emissions in the energy sector
- Revision of the Regulation on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry (LULUCF)
- Revision of the Directive on deployment of alternative fuels infrastructure
- Revision of the Regulation setting CO_2 emission performance standards for new passenger cars and for new light commercial vehicles

Next to the bulk of documents expected in June, the revision of the energy performance of Buildings Directive (EPBD) and the revision of the Third Energy Package for gas (Directive 2009/73/EU and Regulation 715/2009/EU) to regulate competitive decarbonised gas markets are programmed for the last quarter of 2021. ■

© Alexandros Michailidis/shutterstock.com, European Commissioners for European Green Deal Frans Timmermans during a press conference with European Commissioner for Energy Kadri Simson in Brussels, Belgium on Sept. 17, 2020

Revision of EU's Industrial Emissions Directive

The European Commission will propose a revision of EU measures addressing pollutant emissions from large industrial installations by the end of 2021. The aim of the revision is to progress towards the EU's zero pollution ambition for a toxic-free environment and to support climate, energy and circular economy policies.

The Industrial Emissions Directive (IED) has played an important role in reducing emissions of pollutants from industry, especially to air, but has made a more limited contribution to decarbonisation and the circular economy. It is the governance model, which is based on co-creation of environmental standards with EU member states, industry and environmental NGOs that the European Commission would like to see a wider use of.

Several case studies published by the EU Commission have demonstrated that EU industrial emissions legislation creates incentives and opportunities for companies to lower their environmental impact and improve their competitiveness, as well as to gain acceptance of their industrial activities among local communities. The revision will explore opportunities to improve and further develop the IED for a wider scope and impact in line with the European Green Deal.

Seven major areas (Zero Pollution Ambition; Non-toxic environment; Carbon neutrality at EU level; Circular Economy; Deployment of breakthrough technologies; Ensure proportionality of EU law; and Public access to information) are currently under consideration in the EU's impact assessments. Addressing specific issues related to those areas, such as the fact that greenhouse gas emission mitigation is not the primary goal of the IED, misalignment with other legislation (e.g. REACH, Water Framework Directive), or the lack of monitoring of plant-level measures for improvement of resource efficiency in the value chain, would make the IED more instrumental in the achievement of the European Green Deal's goals.

Some of the most pressing items currently being investigated are related to the expansion of the scope of the IED (which could bring to the inclusion of activities such as oil and gas extraction, battery production and recovery, and methane recovery), improvements on data monitoring and reporting, introduction of directly binding greenhouse gas emission limits and/or energy efficiency standards in the IED, upscale and formalisation of the Industrial Emissions Innovation Observatory as a platform to monitor readiness levels of innovative and breakthrough technologies, and promotion of industrial symbiosis.

The revision of the Industrial Emissions Directive is expected to be finalised in the last quarter of 2021. A public consultation on the IED is currently open until 23 March 2021.

As a member of the IED Forum's "Expert Group on the exchange of information on Best Available Techniques related to industrial emissions", ETN is attending the meetings and monitoring the developments, informing our members about the latest updates, and providing opportunities to share input. ■

Upcoming meetings and events

Meeting/Event	Date	Location
Flexible Power Generation webinar: 5th episode	2 February 2021	Virtual meeting
Flexible Power Generation webinar: 6th episode	2 March 2021	Virtual meeting
ETN Annual General Meeting & Workshop Week**	15-22 March 2021	Virtual meeting
ETN LM2500 User Group Meeting	15-17 June 2021	Virtual meeting
ETN High-Level User Meeting**	11 October 2021	Brussels, Belgium
ETN's 10th 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.

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