JUNE 2021

ENERGY INDUSTRY REVIEW

GREEN CEMENT
Is It Truly Environmentally Friendly?

RENEWABLE ENERGY MARKET
Outlook for 2021 and 2022

COAL MINES IN EUROPE
A Reality We Still Need to Accept

Vasile Mogoș, Managing Director & VP Eastern Hemisphere, CDI Oilfield Services ELS

Romanian Business Model to Be Expanded Internationally

clean energy since 1909

ROMGAZ

S.N.G.N. ROMGAZ S.A.

The company is listed on Bucharest Stock Exchange and GDRs are transacted on London Stock Exchange.

Romgaz undertakes geological exploration in order to discover new gas reserves, produces methane by exploiting the reservoirs included in the company portfolio, stores natural gas in the underground deposits, interventions, workover and special operations on wells and technological transport.
Starting with 2013, Romgaz extended its scope of work by taking over the Iernut thermoelectric power station, and thus it became also electric power supplier.

Romgaz is the largest natural gas producer and the main supplier in Romania.

www.romgaz.ro

Green H2, Energy Integrator in Romania

EU leaders have recently recognized gas as a transition fuel that plays a role in ensuring that we phase out more polluting sources of energy, such as coal.

"Europe's renewable drive can come as a challenge, as some countries will see oil and gas export revenues diminish. Therefore, we must turn the green transition into an opportunity. That means helping the region to increase electrification for its own economic development, diversify its supply and increase its export opportunities towards Europe, for instance of renewable electricity or green hydrogen," EU Commissioner for Energy Kadri Simson recently affirmed. "Hydrogen is projected to grow from less than 2% today to 13-14% within the next thirty years," he added.

The only study conducted so far on H2 injection into gas transmission and distribution networks in Romania explicitly shows that the solution for a Romania with mainly green energy is to use H2 as an energy vector. This would also mean reducing the bills to end-consumers. But "a wrong approach, visible today in Romania, to place hydrogen as the exclusive fuel of the future is a mistake that can bring costs by up to 5 times higher at the level of the end-consumer," warns the Intelligent Energy Association, which conducted this study.

The study presents the necessary steps of a Roadmap for implementing H2 as energy vector and integrator. It also identifies 4 scenarios for the development of H2 infrastructure for Romania: (1) conversion of the current gas infrastructure, so that the network is used for gas blended with H2, which basically means the transport of a natural gas-hydrogen mix; (2) gradual reconversion of the current gas transmission and distribution network, so that in the end only H2 can be transported, 100%; (3) partial conversion of only certain transmission or distribution sub-systems - with both options, sub-systems with natural gas-hydrogen mix, or micro-networks with 100% H2; (4) building completely new systems, independent of the current gas infrastructure.

Transgaz has identified certain locations where it will carry out a pilot project for the transport and use of the natural gas-hydrogen mix, in the context in which through the NRRP the distribution infrastructure for gas in combination with H2 has investments of EUR 400 million allocated.

Transgaz provided in the development strategy the integration of hydrogen from renewable and low-carbon sources into the natural gas transmission system, with a view to aligning it with the Existing EU Directives, Strategies and Agreements. The proposed corridors for the transmission of hydrogen ensure the interconnection with all the neighbouring states of Romania, namely Hungary, Serbia, Bulgaria, Ukraine, and the R. of Moldova and also provide access to the existing underground gas storage facilities.

"H2 is the chance for Romania to have mainly green energy in the future, and this will only be achieved if the action is moved from the superficial plan of the current approach to a deeply professional plan," concludes the Intelligent Energy Association.

Lavinia Iancu
Publisher

CONTENTS

ENERGY INDUSTRY REVIEW | June 2021 • Year 4 • Number 36

CONTENTS

OIL & GAS

ENVIRONMENT

POWER

METALS & MINING

RENEWABLES

ANALYSIS

New Processes and Technologies to Produce Value from Waste

Alfa Laval has signed a partner agreement with EasyMining to develop new processes and technologies to extract commercially valuable products from waste materials and enable circular solutions.

Alfa Laval's expertise in mechanical and thermal separation will ensure waste minimization, zero liquid discharge and chemical reuse within EasyMining's processes. These include extracting phosphorus and other resources from incinerated sewage sludge and producing clean road salt and fertilizers from hazardous ash.

"This partnership combines Alfa Laval's technology expertise with EasyMining's innovative processes to accelerate sustainable solutions for the circular economy. With these processes it will be possible to transform waste into valuable products again, which is a key step in building a more sustainable society," says Susanne Pahlén Åklundh, President of the Energy Division.

"With the cooperation with Alfa Laval we see the possibility of speeding up the development and commercialization of our processes, which is important for innovation companies. We also see great value in Alfa Laval's expertise in specific projects since separation technologies are important in many of our processes," ads Jan Svärd, CEO of EasyMining.

Bilfinger Awarded EUR 40mln Inspection Contract

Bilfinger will perform inspection services on the offshore assets of Total E&P Denmark (Exploration & Production). The €40 million contract will be booked under Bilfinger's Engineering & Maintenance Europe segment. Commencing in July 2021, the contract will run for five years with 2x1-year extension options. With a focus on advanced non-destructive testing (ANDT) techniques, Bilfinger will provide a comprehensive range of services on all of Total E&P Denmark's assets. The contract will be managed from Bilfinger's office in Esbjerg, Denmark.

In March 2021, Bilfinger Salamis UK was awarded a multi-million-pound inspection contract by Altera Infrastructure Production AS. The three-year agreement sees Bilfinger extend its existing service delivery with Altera Infrastructure, providing a range of conventional and advanced non-destructive testing (ANDT) services on assets operated by Altera in the UK. The multi-million-pound contract award comes on the back of a successful period of growth for Bilfinger's inspection department, with the company on track to double its inspection revenue by 2023.

Thus, Bilfinger extended its existing service delivery with Altera Infrastructure, providing a range of conventional and advanced Non-Destructive Testing services on assets operated by Altera in the UK.

Baker Hughes and Bloom Energy to Deploy Low carbon Power-generation and H2 Solutions

Baker Hughes and Bloom Energy will collaborate on the potential commercialization and deployment of integrated, low carbon power-generation and hydrogen solutions to advance the energy transition. Baker Hughes and Bloom Energy will begin collaborating on potential customer engagements immediately, with the objective of launching pilot projects over the next 2-3 years and fully commercializing and scaling applications, products, and solutions shortly thereafter.

The companies will focus efforts in three areas: Integrated power solutions; Integrated hydrogen solutions; Mutual technical collaborations.

For hydrogen, Baker Hughes provides compression and energy conversion technology and services that are used across the value chain worldwide, including production, transportation, and utilization. Bloom Energy's modular and fuel-flexible energy server platform can use biogas and hydrogen, in addition to natural gas, to create electricity at significantly higher efficiencies than traditional resources. In addition, Bloom Energy's fuel cell technology can be used to create hydrogen, which is increasingly recognized as a critically important tool to enable the full decarbonization of the energy economy.

Romania and Israel to Cooperate in the Natural Gas Sector

From left to right: CCIR President Mihai Daraban; Israel's Ambassador in Romania David Saranga; Advisor to CCIR President Lazar Comanescu

Romania and Israel want to boost collaboration in the energy sector after gas reserves have recently been discovered in Israel and specialists in the two states could make a useful exchange of expertise. This is one of the conclusions of the meeting that the President of the Chamber of Commerce and Industry of Romania (CCIR), Mihai Daraban, had on May 10 with H.E. David Saranga, Israel's Ambassador in Romania. The meeting was mainly aimed at analysing the status of economic cooperation between the two states and identifying the optimal ways to consolidate bilateral economic relationships.

"Between the two states there is a high level of economic cooperation, with over 8,000 companies with Israeli capital registered in Romania. Although the volume of exchanges of products and services is close to EUR 1 billion, we all agree that the potential of the two states is much higher. Only if we consider that, recently, gas reserves have been discovered in Israel, we can definitely identify opportunities of cooperation between specialists of the two states in the energy sector. In this context, it becomes very important to know in due time the size, turnover and interest in the Romanian market of Israeli companies," said CCIR President Mihai Daraban.

In turn, Israel's Ambassador in Romania David Saranga pointed out: "For Israel, economic cooperation with Romania is a top priority. Therefore, we will need to boost dialogue between the representatives of companies in the two states. We can develop intense relationships in economic sectors such as: agriculture, water management, cybersecurity, health, and digital health solutions. As you know, Israel is leader in innovation and digitization, things that Romania can also take full advantage of."

ENERGY INDUSTRY REVIEW

Publisher:
Lavinia Iancu
lavinia@energyindustryreview.com

Business Development Manager:
Marius Vladareanu
marius@energyindustryreview.com

Scientific Board:
President: Prof. Niculae Napoleon Antonescu PhD
Members:
Prof. Lazar Avram PhD; Assoc. Prof. Marius Stan; Prof. Ionut Purica PhD; Alexandru Patruti PhD

Senior Editor:
Evgenios Zogopoulos

Contributing Writers:
Adrian Stoica, Daniel Lazar, Ioan-Corneliu Dinu, Rona Rita David

Digital Manager:
Justin Iancu

ISSN 2601 - 3819
ISSN-L 2601 - 3819

41 Costache Negruzzi St., 100147,
Ploiesti, Prahova, Romania
Phone: +40 (0)344-143.530;
E-mail: office@energyindustryreview.com

New Technology for Full Recyclability of Wind Turbine Blades

A coalition of industry and academic leaders have developed a new technology to enable circularity for thermoset composites, the material used to make wind turbine blades. The new technology delivers the final technological step on the journey towards a fully recyclable wind turbine value chain. To enable the adoption of this new technology, and to advance a circular economy across the wind industry, a new initiative entitled CETEC (Circular Economy for Thermosets Epoxy Composites) has been established. Within three years, CETEC is aiming to present a fully scoped solution ready for industrial adoption, based on commercialisation of the novel circularity technology.

Developed by DreamWind, an innovation initiative driven by the same partners, the new technology consists of a two-step process. Firstly, thermoset composites are disassembled into fibre and epoxy. Secondly, through a novel chemcycling process, the epoxy is further broken up into base components similar to virgin materials. These materials can then be reintroduced into the manufacturing of new turbine blades, constituting a new circularity pathway for epoxy resin.

EBRD Backs First Green Bond Issued by Raiffeisen

Reinforcing its position as a leader in green finance and a strong supporter of capital markets, the European Bank for Reconstruction and Development (EBRD) has invested RON 53 million (€11 million equivalent) in a senior preferred green bond issued by Raiffeisen Bank Romania, a subsidiary of the Austria-based group Raiffeisen Bank International.

Thanks to healthy demand, Raiffeisen raised RON 400 million (€81 million equivalent) to finance climate and environmental projects. The bonds have a five-year maturity and are expected to be listed on the Luxembourg Stock Exchange and on the Bucharest Stock Exchange. The issuance was 1.6 times oversubscribed.

The EBRD aims to become a majority green bank and dedicate more than half of its work to climate finance by 2025.

The EBRD's investment in Raiffeisen's issuance builds on the Bank's strong commitment to the development of Romania's capital markets. In the past five years the Bank has subscribed to 11 bond issuances for more than €530 million and participated in three initial and secondary public offerings in transactions worth over €80 million.

Engie Romania Acquired New Photovoltaic Park

Engie Romania has completed the acquisition of an operational photovoltaic park, with a total installed capacity of 5.46 MWp, from a company owned by two German investors. The photovoltaic park is located in the southern part of Romania, in the village of Nenciulesti, Teleorman County. The park was commissioned in 2014 and, since then, it has produced ~42 GWh, the equivalent of the annual electricity consumption of 25,000 households.

This acquisition is a new step, after the acquisition of a photovoltaic park with a capacity of 9.3 MW in December last year, towards reaching the goal of developing company's portfolio of installed capacity of renewable energy, both by organic growth and through acquisitions.

Engie Romania currently operates 113 MW of renewable energy in wind and photovoltaic capacities. Prior to this acquisition, Engie Romania was present on the domestic market of renewable energy by operating two wind farms, located in the counties of Braila and Galati, and a photovoltaic park in Harghita County.

2021 Energy Tech Day

Exquisite Coverage of Oil & Gas Tech and PETEC Conferences

24th of June

JW Marriott Bucharest Grand Hotel

The Garden Pavilion and Terrace

Powered by ENERGY INDUSTRY REVIEW

PARTNERS

COMOTI ROMANIAN RESEARCH & DEVELOPMENT INSTITUTE FOR GAS TURBINES

THE SNIFFERS

HIDROELECTRICA

ROMGAZ

Signify the meaning of light

OMV Petrom The energy for a better life.

TRANSGAZ MAGISTRALA ENERGIEI

Atlas Copco

Knowledge Partner

Federația Patronală Petrol și Gaze

Coffee Break Sponsors

DEPOGAZ

GSP

Evergent INVESTMENTS Drive for performance

GIE Setting Out Future Hydrogen Infrastructure

The regulation of the future hydrogen infrastructure is at the core of today's energy debates. GIE publishes a position paper presenting the views and recommendations of its 70 members from 27 European countries.

This paper outlines clear policy recommendations that will boost the establishment of the hydrogen economy. It also presents the unique benefits of the gas infrastructure in integrating hydrogen. With the already acquired expertise, the gas infrastructure operators can build and operate new dedicated hydrogen infrastructure in safe conditions. Within the context of upcoming EU legislation, GIE presents policy recommendations to enable the gas infrastructure to efficiently integrate hydrogen, thereby contributing to the targets of the EU Green Deal.

"Gas infrastructure operators are very well-equipped to integrate hydrogen into their systems. If we want to deliver climate neutrality by 2050 and achieving the targets of the EU Hydrogen Strategy, we need a very well-developed infrastructure for hydrogen. The existing gas infrastructure can offer that. Building on the existing gas network guarantees safe transport, storage and import of hydrogen. It also keeps the costs low for society and brings benefits to the whole energy system," Boyana Achovski, Secretary-General of GIE, states.

GFR'S First ETA Application for Rail Industry in the Region

Grup Feroviar Roman (GFR) launched the first ETA application for rail industry in the region; the proposed solution responds to a real need of rail freight operators, as the industry's main competitor - road transportation, already has access to numerous such solutions, thus giving it an important competitive advantage.

For the first time in Romanian and South-Eastern European railway industry, GFR has developed and implemented a digital service that provides real-time estimates about trains and wagons' arrival at the destination or at certain train stations along the way.

"The ability to estimate the time of arrival has become commonplace for road transport, because today we all have access to many applications developed by some of the largest software companies in the world. In railway, the development of such a platform is much more complex, given the characteristics of this type of transport," explains Amedeo Neculcea, Deputy General Manager of Grup Feroviar Roman and coordinator of this project.

IRENA and Siemens Energy to Advance and Deepen Transition to Renewable Energy

IRENA and Siemens Energy will strengthen collaboration on the application of technology to advance and deepen the transition to renewable energy around the world. The wide-ranging scope of collaboration extends to a variety of opportunities including developing the business case for green hydrogen as a major contributor to deep decarbonisation, furthering joint efforts to promote heat generation and industrial processes, decarbonising hard to abate industries like cement, steel, and petrochemicals, and facilitating private sector investment in the renewables sector.

IRENA and Siemens will also exchange knowledge and expertise on renewable electrification, including the development of roadmaps that prioritise communities and regions currently lacking access to modern energy. "Partnerships are the cornerstone of global efforts to achieve the sustainable development goals and key to the rapid acceleration of the global energy transition," said Francesco La Camera, Director-General of IRENA.

"This partnership leverages and amplifies both of our organisations' strengths to accelerate the energy transition," said Christian Bruch, CEO of Siemens Energy. "Action to tackle climate change is a global imperative. Our best chance of success is through strong partnerships with dedicated organisations. We believe that innovative technologies are the key to combating climate change," he pointed out.

New Presidency Team for Eurelectric

Corina Popescu, CEO of Electrica

On 20 May 2021, Eurelectric's Board of Directors unanimously elected new Presidency team. The new Presidency team 2-year mandate will run until summer 2023, during which the Presidency will give strategic impulse to the association and the electricity industry at EU level, along the lines of the Presidency Manifesto.

Jean-Bernard Lévy, Chairman and CEO of the Paris-based electricity utility EDF Group, was elected President of Eurelectric, the association representing the European power sector which brings together more than 3,500 companies in power generation, distribution, and supply. His two-year mandate will pursue the transformations needed to shift away from fossil fuels, making the Green Deal a reality through electrification.

Upon his election, Jean-Bernard Lévy said: "I am honoured to take on this responsibility, as I am convinced that electricity will be the path to carbon neutrality, and the key enabler of at least 55% of CO2 emissions cuts across the economy by 2030. I have a clear conviction that the power sector, with its range of low carbon technologies, digital solutions and its ability to innovate, can help all EU citizens benefit from an affordable, climate friendly and comfortable lifestyle."

During his Presidency, Jean-Bernard Lévy will be supported by two Vice-Presidents: Corina Popescu, CEO of Electrica, the Romanian electricity supplier and distribution operator, and Leonhard Birnbaum, CEO of the German energy supplier E.ON.

ENTSOG to Incorporate H2 Regulatory Framework into Gas Regulation

ENTSOG has published its position to incorporate the hydrogen regulatory framework into the gas regulation, as the most efficient way of ensuring regulatory alignment and energy system integration between the two closely related gaseous energy forms.

The European Commission (EC) are currently undertaking a review and revision of the Gas Directive 2009/73/EC and Gas Regulation (EC) No 715/2009, referred to as the Hydrogen and Decarbonised Gas Market Package. ENTSOG believes this is an opportunity to maintain an integrated regulation of natural gas, also in decarbonised form, hydrogen, biomethane and other low carbon gases from the outset, resulting in substantial benefits both to consumers and infrastructure operators. EC issued their EU strategy for Energy System Integration in July 2020, calling for stronger cross-sectoral links in the EU's current system to achieve a cost-effective decarbonisation of the EU economies.

ENTSOG believes the energy system integration concept should be applied not only to gas and electricity sectors, but also to gas and hydrogen.

Ukraine's First Industrial Lithium-ion Energy Storage System

On May 21st, DTEK has officially launched Ukraine's first industrial lithium-ion energy storage system, installed at the Zaporizhzhya Power Plant in the city of Energodar, with a capacity of 1 MW/2.25 MWh. The battery will store and dispatch electricity to the grid, as well as maintain the functioning of Ukraine's power system. With this pilot project, DTEK intends to establish a key role for the use of energy storage systems in various segments of the country's energy market, as well as drive the decarbonisation of Eastern Europe in support of the EU Green Deal.

"Our modern energy industry must become the driving force behind the growth of the Ukrainian economy and welfare of Ukrainians. The launch of our country's first industrial energy storage system is DTEK's latest investment into the future of the national energy sector. This project effectively launches a new market for energy storage systems in Ukraine. Moreover, these storage solutions will be key to ensuring the energy security of our country, as well as a new point of development for the Ukrainian energy industry," said Rinat Akhmetov, DTEK owner.

OMV Petrom Divests Kazakh Production Assets to Focus on Black Sea Region

OMV Petrom announced the closing of the sale transaction for its 100% shareholding in Kom-Munai LLP (KOM) and Tasbulat Oil Corporation LLP (TOC) in Kazakhstan to Magnetic Oil. The transaction is part of OMV Petrom's strategy to focus its regional expansion towards the Black Sea area in search of the most profitable barrels. KOM and TOC hold the production licenses for four onshore fields, respectively Komsomolskoe, Aktas, Tasbulat and Turkmenoi.

OMV Petrom announced the signing of the transaction on December 29, 2020, and managed to close it in record time, a notable achievement, particularly in the difficult pandemic context. The impact from the transaction on OMV Petrom's operational indicators is limited, as Kazakhstan operations represented only a small part of OMV Petrom's overall portfolio. In 2020, the cumulated daily production of the four fields was 6.76 kboe/d, representing 4.7% of the Group production, while the 1P reserves of 21.8 mn boe accounted for 4.6% of Group reserves.

OMV Petrom entered the Upstream sector in Kazakhstan in 1998. All fields are located in the Mangistau region of West Kazakhstan near the Caspian Sea. The four onshore fields cover a total area of 86.52 km^2, including approximately 75 wells, production facilities and 200 km of pipelines.

Challenging applications and tough environments

Ever since we first struck oil, it has been a vital asset to us. Every day we use hundreds of things that are made from oil or gas. In an industry with challenging applications and tough environments – Safety, reliability and innovation are key. And a global presence for local needs. It is hard to imagine the world without it. We are global – never far away. We believe in individual solutions. Atlas Copco – safe, high quality products that will increase your productivity.

Atlas Copco Tools Romania
Atlas Copco s.r.o., Elektrarenska 4, 831 04 Bratislava, Slovakia
Phone: +40 730 088 707, e-mail: florin.bujor@atlascopco.com
www.atlascopco.com/ro-ro/itba

Will We Enable a Just and Socially Inclusive Energy Transition in Romania?

"No person and no place are left behind in the energy transition" is the promise that the European Commission made when issuing the EU Green Deal in December 2019. This action plan envisages to make the EU's economy sustainable by turning climate and environmental challenges in opportunities and to foster a just and inclusive energy transition where no person and no region are left behind.

The EU Green Deal covers 9 policy areas (biodiversity, sustainable food systems and agriculture, clean energy, sustainable industry, energy efficiency in buildings, non-polluting transportation, and mobility, eliminating pollution and climate action). Energy and climate policies are at the core of the EU Green Deal. The ambitions of the EU are very high and deeply transformative: achieve climate-neutrality by 2050 and reduce by at least 55% the greenhouse gases emissions by 2030, as compared to 1990 levels. Clear binding targets will be presented by the EC in the revised climate and energy legislative packages, planned to be issued in June 2021.

Financing mechanisms foreseen by the EU Green Deal

The decarbonisation of the economy is set to be achieved by investing in innovation, research, and development (R&D) which will enable the developing of new energy solutions and environmentally friendly technologies to use, store and generate green energy. At the same time, another promise of the EC is that the energy transition will be just and inclusive for all – no one is left behind. That is why, one focal point in this energy transition is in fact the solidarity with the most affected regions in Europe, heavily dependent on fossil fuels, to ensure that the EU Green Deal stands a chance of actually becoming a reality in which a bottom-up approach is implemented, and account is taken of the contributions of civil society, stakeholders and energy citizens.

Understandably, in this energy transition, the starting points of the Member States is not and will not be level, as this depends on their stage of economic development, financing and investment opportunities in low-carbon technologies and infrastructure mandatory to foster a successful energy transition. This latent gap and tensions triggered by the uneven developments between the Eastern

Lavinia Tanase *is an EU energy law and regulation specialist, former Research Associate Florence School of Regulation*

European countries and the West is and will be most revelatory now, during the energy transition. A fair and just transition for all is the goal. Therefore, money will be made available. And a lot of money, as it seems. The time to seize funding opportunities is now!

The investment pillar of the Green Deal is known as the European Green Deal Investment Plan (EGDIP) which plans to mobilise around 1 EUR trillion in sustainable investments until 2030. The EGDIP receives around 30% from EU's long-term budget and NextGeneration EU recovery plan, in amounts of up to approx. 555 EUR bln. In addition to that, the EGDIP receives money from the national budgets of the Member States, from public and private investments mobilised by InvestEU (the guarantor of lenders such as European Investment Bank or national banks) and the Modernisation and Innovation funds (financed from ETS trading).

The time to seize funding opportunities is now!

An important part of the EGDIP is the Just Transition Mechanism, designed at unlocking financial and technical support of around 100 bln EUR for the regions, businesses, and workers most affected by the energy transition and alleviate its socio-economic impact. The Just Transition Mechanism receives financing from the EU's budget and NextGeneration EU, from the Member States, InvestEU, and EIB and comprises of:

1.A Just Transition Fund used to provide grants (17.5 EUR bln by 2027, 7.5 EUR bln from the EU budget and 10 EUR bln under NextGeneration EU recovery plan);

2.A dedicated just transition scheme under InvestEU that will crowd private investments (30 EUR bln in investments);

3.A public sector loan facility of 10 EUR bln, backed by 1.5 EUR bln of the EU budget, mobilising up to 30 EUR bln in investments.

The Just Transition Mechanism is, however, more than funding. The mechanism also includes a strong governance framework and a Just Transition Platform through which the European Commission aims to provide technical assistance to Member States and investors and to ensure that affected communities, local authorities, social partners, and non-governmental organisations are involved. The EC ensures that all the Member States, and especially the regions which are most carbon-intensive in the EU or in which the occupation of the majority of the population is in fossil fuels will receive support.

The funding may be made available to the Member States by submission of territorial just transition plans (TJTPs) which will identify the regions most affected that should receive financial and technical support and should provide an outline of the energy transition process until 2030, consistent with the targets of the National Energy and Climate Plans of the countries concerned for the transition to a climate-neutral economy by 2050. The plans should also set out ways to best address social, economic, and environmental challenges, and give details on needs and measures for economic diversification, reskilling and environmental rehabilitation as appropriate.

A social and just energy transition in Romania's coal-mining regions

The TJTPs are most relevant for carbon intensive regions in Romania, such as Hunedoara, Gorj, Prahova, Mures, Galati and Dolj. According to the preliminary analysis of the EC on the Just Transition Fund Territorial Eligibility, the regions of Jiu and Gorj (Rovinari/Turceni), along with Mures, Prahova, Dolj and Galati have been identified as facing serious socio-economic challenges during the energy transition.

In Romania, the coal-share amounts to a staggering 25% of the total energy production mix. The regions of Jiu (Hunedoara county) and Gorj are the central points of coal mining, where approximately 90% of the country's coal mining workforce lives and works. These coal mining regions emit 90% of the GHG emissions caused by Romania's coal fired power plants, or 30% of all Romania's emissions stemming from mining and manufacturing. Similarly, a significant number of the workforce is

employed in fossil fuel power and heat generation or energy intensive manufacturing and heavy industry (chemicals, metal processing cement, fertilisers, etc.) in Dolj, Galati, Prahova and Mures.

Clearly, considering the ambitious targets of the EC during the energy transition, a phase-out of the coal and lignite in these regions automatically means that the jobs of the workers will be endangered and that the coal economy will be put at risk while being replaced by a green and decarbonised economy of the region. While undergoing a deep transformation from a carbon-intensive region into a green one, these areas must receive financial support from the Romanian Government and the EC under the Just Transition Mechanism scheme.

The initial allocations under the Just Transition Mechanism show approximately 2 bln EUR to be allocated to Romania to support a just transition. These regions must prepare and submit their TJTPs which shall be in line with the country's National Energy and Climate Plan (link). The Romanian Ministry for EU Projects (link) has been established by the Romanian Government as the lead authority in implementing and coordinating the development of the TJTPs in Romania, ensuring transparency and involvement of all involved stakeholders, including the County Councils, as well as private enterprises, civil society organisations and local stakeholders. In addition, the Ministry for EU Projects has set up the Just Transition Operational Programme for the next EU budget financing period in order to streamline the money that will come to the country the Just Transition Fund. It is important that the TJTPs in Romania reflect the implementation of a bottom-up approach for the decarbonisation of the affected regions. Policy creation and the deep economic transformations of the economies in the region cannot and should not only be orchestrated at national level for a country of the dimensions and variety of Romania.

Currently, there are under public consultation the TJTPs for Hunedoara, Dolj, Gorj, Mures, Prahova or Galati counties. It would seem that a participative process at this scale had not taken place in Romania before, according to Bankwatch Romania. A study commissioned by the Romanian Ministry for EU projects has found that the role of the stakeholders and of civil society is seen to be very important during the creation of the TJTPs and less impactful in the period of implementation of these TJTPs. The involvement of the stakeholders is mandatory for a socially just energy transition based on principles of transparency, accountability, fairness, responsibility of the governments and effective monitoring.

In this respect, the EC should become a watchdog over the inclusive finalisation of these TJTPs, following public consultations and their correct implementation. According to a report of Bankwatch Romania, the Romanian authorities still do not see the coal industry's inevitable closure by 2030 in concrete terms and are instead seeking funding to finance individual projects without a long-term integrated vision. Irrespective, the EU trends for carbon-neutrality by 2050, soon to become obligations once the European Climate law will be issued in June 2021, will become impossible to neglect or avoid. Action will have to be taken. No one should be left behind. This is why, the TJTPs for the 6 Romanian regions most affected by the energy transition shall propose that the funds may be used for repurposing projects of the already existing plants or inefficient facilities, deployment of technologies and infrastructures for clean energy, investments in small and medium enterprises, including start-ups or new firms, which may lead to economic diversifications and reconversion, investment in research and innovation, job assistance, upskilling and reskilling of workers.

For a successful energy transition, I reckon that we will not only need financing, even though fundamental, but we will require inclusivity, transparency, participation, and opportunity to become a change factor. The grand energy transition may only be achieved if we acknowledge the need to localise the energy transition and enable citizenship participation. The way in which the TJTPs are now drafted and implemented is now crucial and the gateway to access the funding under the EU Just Transition Mechanism.

Disclaimer: *The views and opinions expressed in this article are those of the author's and do not reflect the official policy or position of any other agency, organization, employer, or company.*

A stronger Romania.

With energy from the Black Sea.

OMV Petrom

The energy for a better life.

Small Wind Turbines in Agricultural Areas

The small agricultural enterprise is interested in two current topics, one related to the business portfolio (cultivated area, production, and distribution); another, recognized as more sensitive, related to economic sustainability the environmental point of view, of one's own activity.

The two topics are also reasons that should be considered as an assumption of electricity supply from renewable sources (wind power in this case), by installing small wind turbines of maximum 25 kW, on poles not higher than 24 m.

The option is very used, although lately both constructors and specialists in energy efficiency put first the optimal ratio between the requirements of development of own company and demand and supply of energy produced.

Advantages and strategic approaches

The advantages of choosing small wind turbines for an agri-food company that obtains production in an area recognized as suitable for wind power are multiple, such as:

- Much lower costs compared to other electricity generation forms;
- Due to incentive schemes, investment in installing the small wind turbines is amortized in a short time;
- The possibility that at the place of energy generation it is either used by the agri-food company, or sold in the network, depending on natural factors, which are decisive. It is necessary that the regulatory energy mechanisms, as well as those for stimulating investments in the production of energy from renewable sources be sustainable and always promoted and approved by the legislative system.

To better understand the possibility of a further expansion of using certain technologies, in particular those related to small power turbines, specialists claim that consultancy firms in this field should be considered. Hiring these consulting firms or independent consultants is important, especially for new technologies about which, unfortunately, there are discussions without knowing the technical and economic implications of their application.

Regarding the installation of the small wind turbines, it is essential not to create false opinions and distortions.

It is fundamental to give possible users the assurance that the intensity of wind, in the area where such plants exist, does not drop below the parameters taken into account and considered as such in the execution project. For this, it is necessary that the investor who chooses to invest in such plants has the possibility to assess wind intensity not only statistically, but also based on appropriate measurements, comparing them with the data found in the special documentation.

Providing details from a conceptual point of view about the portfolio and how the small power turbine must be chosen to the detriment of other sources used to produce electricity (solar sources, for example) it can be stated that compared to the solar power plant with the same production level, i.e., 25 kW, with the current technology the entire investment is around EUR 100.000.

Also considering the dynamics between demand and supply, there are small advantages of the wind power plant,

Ioan-Corneliu Dinu *is a Scientific Counsellor at Romanian,National Committee of the World Energy Council*

although incentive schemes in this case favour the photovoltaic source. What makes attractive the use of the small power turbine is the quicker return on investment (8-10 years), obviously in an area with appropriate wind activity.

Another advantage of the installation and use of the small power turbine in an agri-food farm is the fact that the energy produced can even be sold locally in case of intense wind activity, obviously after ensuring the energy needs of the farm (operation of machines and installations of the farm, space heating/cooling etc.).

In the situation described above, the owner uses the exchange of electricity with the grid, considering it as a large battery for energy produced and left unused after covering the full needs of the agro-industrial farm.

Despite all these advantages, in absence of a long-term strategic approach, containing rules on the future development of the electricity production system from wind sources, obviously taking into account the environmental impact caused by the random installation of generator support poles with propellers, of diminishing the sonic impact felt in the localities in the vicinity of these plants, it is understandable that the future of mini-wind power plants will not be easy. And this not necessarily due to the investment boom in other renewable electricity production sources. We can safely state that in areas with good wind activity, areas exposed mainly to the sun, small wind and solar power plants can be complementary.

A properly integrated project from a technical and economic point of view, supported with investment, an adequate electricity and heat distribution to localities in that area, approvals and permits necessary to develop the investment, proving the complementarity of the two systems (wind and solar) can be highlighted, with the possibility to consider this a good example of similar approaches for other areas.

ROMANIAN BUSINESS MODEL TO BE EXPANDED INTERNATIONALLY

Interview with Vasile Mogoș, Managing Director, VP Eastern Hemisphere at CDI Oilfield Services ELS

by **LAVINIA IANCU**

Photographs by **JUSTIN IANCU**


ENDURANCE
LIFT SOLUTIONS
CDI
OILFIELD SERVICES
S.R.L.

CDI Oilfield Services, a subsidiary of the US company Endurance Lift Solutions, was established in 2007. The initial business model - assembly and repair of downhole pumps, represented the foundation for the subsequent evolution of the company. The same year, CDI opened the first Centre of pump and equipment repair and assembly in Romania, equipped and operated at the international standards of the oil and gas industry. Then, in 2015, the Centre of Excellence was opened, designed as a platform of production, development, innovation, training, storage, processing, and integration of data, to serve clients.

We are talking with Vasile Mogoș - Managing Director, VP Eastern Hemisphere at CDI Oilfield Services Endurance Lift Solutions (ELS), about the important steps taken by the company in the almost 14 years since establishment and about the future stages, in conditions of maintaining the performance of equipment and services both domestically and internationally.

Dear Mr. Mogos, how do you estimate the course of the company in the almost 14 years of activity on the Romanian market, but also at international level? What are the most important achievements so far?

First of all, I would like to personally thank you and also on behalf of CDI colleagues and investors for the attention and support which our company enjoyed since the very beginning of this collaboration.

I would take the opportunity to thank our partners, OMV Petrom, Mazarine Energy, Expert Petroleum, which benefited from the expertise of our services and our well pumping products quality.

The evolution of CDI Oilfield Services is a successful story written by the people and for the people. I say this because the support of our investors and the efforts of my colleagues, from both management and pump shops levels, have a very important contribution to optimizing the activity of our partners in their oil well operations.

Few years back I was telling you that, on its way to the surface, every drop of the millions of barrels produced in Romanian oilfields is passing through the downhole pumps manufactured by CDI. We are proud and honored with our position in the oil and gas industry in Romania.

Our achievements are not necessarily quantified in turnover but rather in increasingly longer life span of our equipment, the swift delivery of pumps and equipment for thousands of interventions and in the client satisfaction. These indicators are at the level of the highest international standards in the sector, and they naturally result in medium and long-term partnerships, thus ensuring the financial sustainability of the company and subsequent investment availability.

Given that some time has passed since our previous discussions, what's new in CDI Oilfield Services' portfolio of products and services for the oil and gas industry?

The novelties made available to our clients are designed to address the increasingly complex problems raised by the operation of brownfields as those in our country. They are designed to optimize production costs by increasing the pumping system efficiency and reducing the total cost of ownership.

I would mention here the diversification of the downhole pumps' portfolio in terms of metallurgy and design, the expansion to a large range of fiberglass rods, installation and maintenance of wellhead gas compressors and downhole equipment having a special contribution in reducing and eliminating production losses due to accidental shutdowns of production wells.

Also, for the wells prone to paraffin deposition, thermochemical treatment solutions have been tested which proved their effectiveness by swiftly cleaning

the rods and tubing string without pulling the wells.

How do you manage to maintain the performance curve of equipment and services for clients, both locally and internationally?

The performance of CDI equipment is a day-to-day priority which is primarily based on an excellent collaboration between our teams working in the pump shops, procurement, operational, engineering, quality and financial departments and our partners' teams of specialists.

The quality of CDI services and products represents the second ingredient for the current performances and a guarantee for the future ones.

The services provided by CDI have a spectrum that goes beyond the activity of pumps and downhole equipment maintenance carried out at the shop floor level. The support of this activity is provided by dedicated engineering and logistics services.

Moreover, the Upstream Interface Platform used for the registration, tracking, analysis, and reporting of causes of malfunctions connects the monitoring team with each pump shop and with our partner team of specialists resulting in solutions which are further optimized to make the right decisions in a timely manner. Therefore, this team effort results in extending the runtime of the equipment between interventions with tens or hundreds of days beyond the increasingly higher targets.

With regard to international clients, the quality of CDI products recommends us to continue collaboration and develop the same towards replicating CDI integrated model of manufacturing and delivery of new pumps along with providing the inspection and repair services thereof in spite of occasional local limitations.

You said the development of partnerships with national and international companies to replicate the CDI business model is a priority for the company. What actions do you carry out in this regard and what are the partnerships currently in progress? What programs and plans are there for the future in this respect?

By far, the longest-running partnership is with OMV Petrom which has a history of over 13 years and will continue with a seven-years contract which was awarded to CDI following a highly competitive public tender in December 2020. We pay the same attention to the other local operators such as Mazarine Energy and Expert Petroleum whereby we act in a similar manner supplying downhole equipment under "CDI inventory on customer's shelf" concept.

Internationally, we pursue on our priority projects with our partners in Oman and Indonesia. These projects implementation has suffered delays due to travel restrictions. Fortunately, facilities meant to accommodate the downhole pump assembly logistics and the necessary inventory have been completed.

Special attention is paid to operators in Europe. We are currently qualifying our products in Serbia, Croatia, Hungary, and Germany with local operators.

CDI has a strategic position being the only API 11AX licensed pump manufacturer in the region having the ability to cover immediate needs due to a generous and diversified inventory.

Due to improved exploration technologies, we can have access to new oil and gas fields. However, challenges faced by the oil and gas industry are constantly growing. What are CDI's strengths in supporting operators interested in the increase in productivity, as well as in cost optimization?

As mentioned earlier, the effort is either to manage the problems raised by pumping wells in mature reservoirs with low pressure and flow rates, but also, as you mentioned, new fields at depths that exceed traditional limits.

The package of solutions and products proposed

by CDI to meet the needs of operators aims at optimizing the well operation costs by increasing the efficiency of pumping and, where possible, increase the wells production.

Another direction we plan to develop is rental of pumping equipment to operators who are planning to test new wells or resume pumping at wells which have shut down for economic reasons.

What are the most important segments to which company's investments are currently directed?

Thanks to a particular interest of our investors in the company's development based on a solid position on the market, CDI has initiated an investment of over EUR 500,000 which will be completed this year through which we aim to develop the domestic manufacturing of an extensive range of pumping equipment. This project joins the efforts of our R&D department, which aims at researching the most efficient solutions and equipment to meet the increasingly complex requirements of our partners.

What measures do you consider for the efficient conduct of business in conditions of the COVID 19 pandemic? What are at the moment the greatest challenges for the company?

As we speak, the measures taken by CDI in 2020/2021 in the context of the pandemic have already shown their effectiveness. We are proud to confirm that, although a large part of our suppliers are US or Canadian companies, the risk plan we have prepared with our partners starting with Q1/2020 enabled us to carry out the activity without delay due to inventory or staff availability. We are talking here about thousands of pumping wells, thousands of inspections and repairs along with the delivery of hundreds of new pumps and equipment at any time of the day and night.

This period has allowed us to assess and prove our capacity of supporting both financially and logistically the management of an inventory that ensures the performance of our clients' activity without interruption under restrictive conditions on delivery and international transport.

Challenges always follow challenges. Today, amid an imbalance between demand and supply, we are facing alarming increases in the raw materials prices with impact on suppliers' prices for parts and equipment. I would expect this phenomenon to be temporary and that the situation will be balanced in the short and medium term.

Integration of labor force in the oil and gas sector remains a sensitive point on employers' agenda. What is the situation at CDI in this chapter?

CDI pays special attention to conditions of ensuring the stability of employees and the pandemic period has proven the importance of a team prepared to comply with the principles of organizational culture and company's procedures, including the extreme ones imposed by the need to protect against infection at work.

Rejuvenation of the workforce is an ongoing concern, and we are making special efforts to recruit young talent. To this extent, we are happy to have two key positions, managing the business development department and the engineering department, which are held by persons just little over 30 years of age. We are equally focusing on the knowledge transfer from the senior employees to the young generation.

We also support the partnerships with the Petroleum-Gas University of Ploiesti and other institutions or national and local communities in the development of joint internship programs and in the direction of popularizing the company's activity.

You registered, over the years, remarkable results in your field of activity. What are your estimates for this year?

For us, the current year is a year of resetting goals and priorities. It is a year in which we reposition our company in the light of the investments we have initiated but also under the new market conditions. Mankind is slowly awakening from numbness. The stones may no longer fit on top of each other after many of the

buildings we consider millennial have been demolished.

Beyond these trials for which we are prepared, we are aware that better results require increased efforts by the entire CDI team. I have great faith in my colleagues!

What are CDI objectives/prospects for the following period and the medium and long-term strategies for a sustainable development of the company?

As mentioned, CDI enjoys the confidence of investors. I would thank Mr. John D. Schmitz, CEO Endurance Lift Solutions (ELS), who has always shown his confidence in CDI performance and pursued on well-founded investment projects.

In addition to the own portfolio, we also have access to the product portfolio of ELS Group, ESP pumps, Plunger Lift, Fiber rods and other special equipment and solutions, which will definitely strengthen our position as supplier of products and services for the whole spectrum of pumping applications.

We are closer to replicating the Romanian business model on international markets. Travel restrictions have slowed down this project but did not cancel the partnerships developed over time.

Although the focus on renewable energy sources is extremely strong, oil and gas will continue to be essential sources of energy in the following decades. Owners, investors, operators are facing large investments, new technologies, increasingly stringent legal, commercial, and environmental requirements. How do you see the future of this significant sector of the economy?

The oil and gas industry in Romania is by far an emblem we should be proud of. Romanian specialists are met in companies with global tradition and reputation.

I would add that, in Romania, looking at the number of filling stations and especially at the car market growth and the overcrowded traffic, petroleum products have a generous market.

How the needs will be met under more aggressive environmental conditions is a question whose answer will be found in the continuous development of technology, from the drilling, extraction, refining activities to marketing. I would leave the emissions from the exhaust pipe to car manufacturers. However, since CDI is found in this puzzle, it is natural for us to be part of the effort to make the oil and gas industry more friendly. ■

Products

API and non-API downhole pumps
Fiberglass Sucker Rods (FSR) and accessories
Steel Sucker Rods (SSR) and accessories
Plunger lift equipment and accessories

Product Services

Downhole API pump repair service
FSR/SSR technical service and installation
Rod string design and optimization
Rod pump failure analysis
Customized services and solutions

Performance-Based Asset Management

Full-line production and run-life optimization
Asset tracking and condition monitoring utilizing our Proprietary Interface Upstream Platform

7 Piatra Craiului St. | DIBO Industrial Parc | Negoiesti | Romania
Phone: +40 244 542 029
For more information please contact us at office@endurancelift.com

CDI
OILFIELD SERVICES

PETROCHEMICALS IN EUROPE

In simple words, petrochemistry constitutes a branch of chemistry that focuses on how crude oil, but also natural gas can be processed and eventually transformed into raw materials for useful products. Such products are nowadays considered an essential part of the modern economies and societies which places petrochemistry right at the very core of value creation for an economy and therefore an incredibly valuable field. It would probably make sense to go over what petroleum is in order to examine the petrochemical industry as a whole.

by **Evgenios Zogopoulos and Konstantinos Michalopoulos**

Natural changes in organic materials have been producing petroleum, in the span of millennia, which usually appears and accumulates near the Earth's surface. Porous sandstone areas are really prone to withhold petroleum. Crude oil is naturally occurring thick liquid consisted of various hydrocarbon compounds. The breakdown of their composition usually gives mainly carbon, hydrogen, Sulphur, and extremely small amounts of nitrogen, oxygen, metals and maybe salt. Depending on the Sulphur they consist of, crude oils are characterized as sweet or sour.

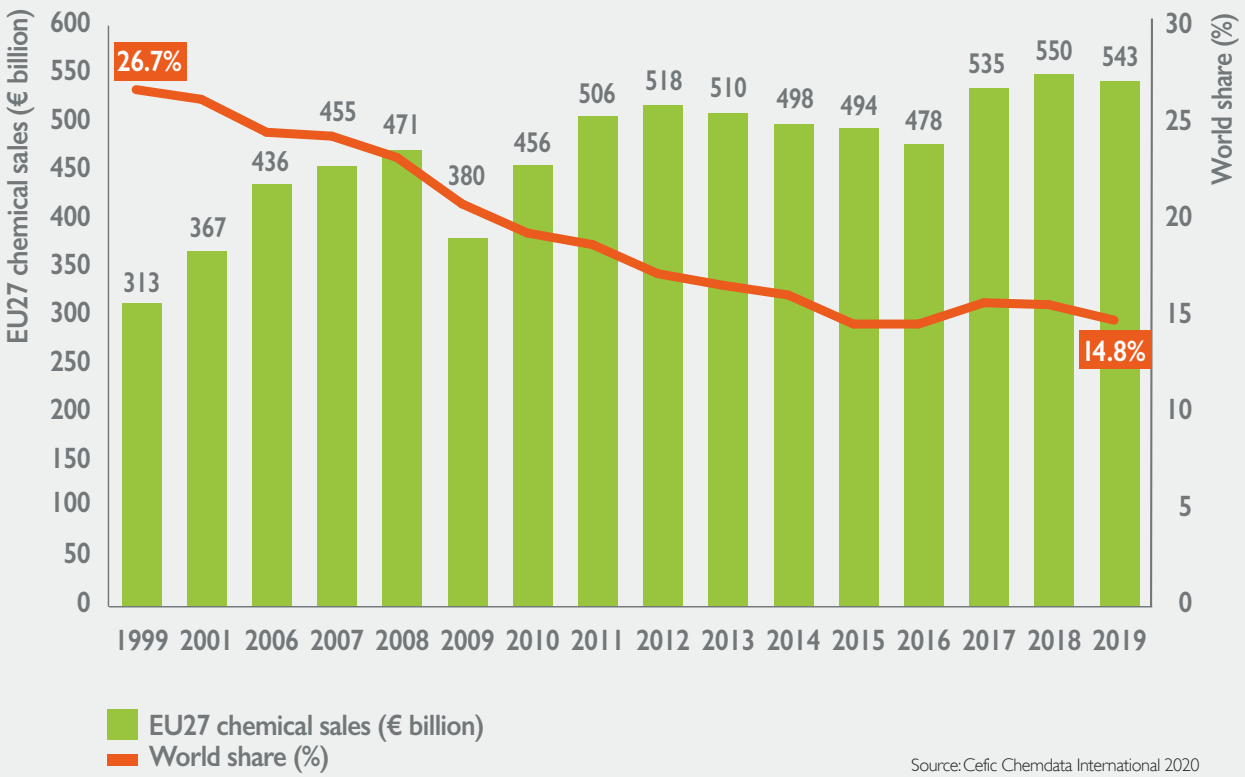
Petrochemistry made its debut in the 1900s contributing to the scientific effort to develop basic materials such as synthetic rubbers. Really early on we got the first petrochemical-derived plastics, a bit later we saw the first petrochemical solvents and around 1930 we had polystyrene. The industry subsequently boomed with the production and innovation of an immense arsenal of materials with almost infinite applications.

Naturally, the petrochemical and chemical industries are immensely important for the European societies and economies. Both are essential for Europe, especially today, when innovative solutions are really required to deliver a low carbon and circular economy both on a European and global scale.

The European council has praised these industries and commented on them as 'indispensable', eager to support innovative projects through the European 'Green Deal' and as part of the goal to be carbon neutral by 2050. This huge challenge will present problems requiring innovative solutions, but it will inevitably give birth to great opportunities for the evolution of the industry. Europe has shown to be more than eager to claim the leadership when

World market share of European chemical sales drops by half

EU27 share of global chemicals market



Source: Cefic Chemdata International 2020

it comes to innovating and deploying competitive new technologies for delivering a climate neutral, circular, and digital transition. Specific examples of that could be technologies for chemistry for batteries, chemical recycling, solar panels, wind turbines, insulation. Part of the range of opportunities will be the road to sustainable economic growth and new jobs creation for the countries of Europe.

The future, especially now with the global pandemic impact, is more uncertain than ever. For example, Cefic, the European Chemical Industry Council, reported a decline in chemical production in the European Union for 2020 but the projections now indicate incremental growth for the years to come. Cefic Director General, Marco Mensink, said: "Cefic welcomes these encouraging green shoots of economic improvement for our sector. 2020 has proven the chemical value chains to be among the most resilient in Europe. The industry stood up, rose to the expectations, and has delivered valuable support on for example disinfectants supply. Full recovery will need further support. A strong industrial policy does not only support the sectors in need but also starts to build upon the sectors proven to be most resilient, which are the basis for tomorrow's economy. To secure the massive investments required for the Green Deal transformation of our industry, and to maintain the European chemical sector's export success story, we look forward to the EU Commission's new industrial policy strategy to provide the markets and conditions for industry to become more sustainable, more competitive globally and more resilient."

In one of their recent studies, Cefic concluded that the industry is at risk and that to sustainable long-term competitiveness, decisive action was required both on a private but also institutional levels. Many reorganization attempts have proven to be effective to that regard and eventually DSM's petrochemical operations were acquired by Sabic, Solvay sold its polymers to bp, Bayer split up Lanxess, Total made Arkema independent. It was still not enough as production kept moving away from Europe and shifting towards Asia.

"Our investment in a gas cracker and world-scale PDH unit is the largest of its kind in Europe for more than a generation and is an important development for the European petrochemical industry. We believe this investment will reverse years of decline in the sector." - **Jim Ratcliffe, Founder and Chairman of INEOS**

Some of the below projects are expected to make a difference for the industry through.

One of the is the INEOS Project ONE, in Belgium, with a cost of 3.4 billion USD. Jim Ratcliffe, Founder and Chairman of INEOS mentioned that: "Our investment in a gas cracker and world-scale PDH unit is the largest of its kind in Europe for more than a generation and is an important development for the European petrochemical industry. We believe this investment will reverse years of decline in the sector."

The project has two parts: an ethane cracking component and a propane dehydrogenation (PDH) unit for the production of ethylene and propylene. The ethylene cracker will be the first to be built in Europe for two decades and will produce 1.54mtpa of ethylene. The PDH plant will use McDermott's Lummus CATOFIN dehydrogenation process technology to produce 750,000 tpa of propylene using CATOFIN catalyst. Both will be located in INEOS' existing polymer-production sites and connected by pipeline to several of the operator's ethylene and propylene derivative units in the region.

The project will reemphasize the strategic importance of Antwerp's port, creating thousands of jobs. Another project has to do with covering the supply shortages of polymer resins. People of the European Plastics Converters (EuPC) trade group have stated that more than 50000 SMEs (small and medium enterprises) have faced severe shortages hindering their operations. Ron Marsh, Chairman of the company, stated: "Europe is a net importer for polymer raw materials and is therefore above-average vulnerable to market disruptions. Logistical problems due to a shortage of containers to Europe also contribute, as does the lower production of plastics in the USA. Furthermore, the demand for certain raw materials used for protective articles against Covid-19 is extremely high. In addition, we see an unprecedented great number of declarations of force majeure,". Furthermore, the trade association mentioned: "This situation is threatening the economic survival of numerous

"Europe is a net importer for polymer raw materials and is therefore above-average vulnerable to market disruptions.This situation is threatening the economic survival of numerous SMEs but also endangering the production of countless products, ranging from applications in the building and automotive industry to essential goods for the food packaging and pharmaceutical supply chains." - **Ron Marsh, Chairman of EuPC**

SMEs but also endangering the production of countless products, ranging from applications in the building and automotive industry to essential goods for the food packaging and pharmaceutical supply chains."

During the European Petrochemical Association (EPCA) annual meeting, important sector players have been cautiously optimistic discussing the projections for a better operating environment; some of them even went to the extent of talking about early signs of a surge in buying interest in the months to come. Set against that relative optimism has to be concerns in Europe over localized its production while surges of COVID have definitely been not helpful; petrochemicals took a major hit and recovery has been patchy; the usual trade flows and export demand have been severely impacted. Those players integrated back to refineries, producing ethylene and polyolefins, have struggled to continue operations with very tough conditions.

Cyclical moves will come but will be influenced by trends that have been impacted or accelerated by the pandemic and therefore the data will not be 'regular'; fundamental shifts in demand patterns will most probably become apparent in time. The demand part of the equation is even more uncertain. The example of Ethylene demand in Europe is characteristic'; even though it been described as 'reasonable' the exact situation is difficult to assess due to planned turnarounds at derivatives units and other derivatives issues. Tranches of cracker maintenance were expected in 2020 but some of them have been moved 2021. Propylene in Europe is somewhat tighter than ethylene with demand into polymer seemingly healthier than that into other derivatives, a reflection, perhaps, of more general industrial uncertainty.

The volatility in the global economic landscape has decisively deterred companies from proceeding to anything more than the absolutely necessary capital expenditures. Markets will most probably shape up, as healthier rates of demand return.

Petrochemical producers know that their future is bound with the commodity capacity cycles, but they still wish for something better.

The European Green Deal, aiming at carbon neutrality by 2050, will have a significant impact on petrochemicals and any such derivative. The EU is pushing hard its green initiatives designed to underpin economic recovery. Additionally, the sharp decline in oil price earlier this year is symptomatic of significantly reduced oil demand due to transportation slowing down. Many players, and their refineries, opted out and shifted towards 'greener' and more sustainable solutions in tandem with the EU's vision. And refineries are mentioned here as they are key for the industry, bound with it through a symbiotic relationship. This works naturally as the petrochemical sector 'recycles' its (by)products to refineries, like hydrogen (used for desulphurization) and other components used for blending fuels. Logistics also play a crucial role in this relationship; for example, many components like gases, which are tricky to transport, making long-distance transportation almost prohibitive. Given this need, many of the EU's petrochemical complexes lie adjacent to refining complexes. This proximity not only gives a solution for the gases but also facilitates many other synergies (pipeline interconnectivity, shared ports, common utility service) resulting to economies of scale and eventually energy optimization. This is part of the reason for which refineries lie at the very centre of regional hubs, with many SMEs located around them.

The industry is also very dependent on some of its main products, like bitumen. Around two-thirds of EU refineries produce bitumen, a very technical and sophisticated construction product, with high level of viscosity and elasticity, extremely performant as glue and extensively used for asphalt with concrete being a near competitor (but it lacks many useful qualities of bitumen). It is also used for roofing and other industrial uses. Shipping and storing it has proven to be very expensive because it has to be maintained hot to remain fluid. It therefore is dependent on refineries being close to customers. Despite its low volumes, bitumen can significantly contribute to a refinery's operations and can prove to be a decisive factor for the whole industry from end-to-end.

drilchem
Loss Control Experts

PARTNER SPOTLIGHT

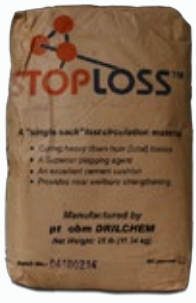
DOSCO PETRO SERVICES

FRACSEAL

FRACSEAL™ is a finely sized (micronised) organic cellulose fibers that is used to minimize fluid invasion, stabilizing unconsolidated sand formations, reducing torque & drag in highly deviated wells, stabilizing shale & coal beds and improving return permeability.

It is to be added in the active mud system for borehole protection by reinforcing / strength-ening the filter cake. The FRACSEAL™ fibers matrix within the thin wall cake will form an impermeable filter cake resulting in a very minimum fluid invasion (loss) into the formation.

FRACSEAL™ is ideal for drilling into various formations such as shale, coal, uncon-solidated sand and limestone. It is also non-damaging and in fact gives a better return when drilling through the payzone. This is due to the matrix of the FRACSEAL™ fibers trapping fine colloidal solids preventing it from invading the pores. The external cake is easily removed when the well is brought into production.



STOPLOSS

A proprietary “single-sack” broad spectrum blend of sized and shaped materials designed to be effective in curing severe to total lost circulation. STOPLOSS™ is ideal for use in highly fractured/vugular formations without the addition of other conventional LCM.

STOPLOSS™ is packaged such that it can be used in remote area or where there is limited space for materials storage. It is thermally stable to > 450oF, 100 % Biodegradable and can be used in all type of drilling fluids.

Dealing with severe losses?
Get in touch with Dosco

DOSCO PETRO SERVICES

Visit dosco.ro
for all our partners & products

Our **Product** is our **Service**

CASE STUDY

LCM Strategy Significantly Cut Down Non-productive Time During Total Loss Scenario at Onshore Drilling Operation

Dosco PetroServices received an LCM (Lost Circulation Material) call-out for a total loss of circulation during an onshore drilling operation in Buzau, Romania. The operator had been experiencing severe to total losses in excess of 5000 m3 on a vertical exploration well. In total, in excess of 5000 m3 of polymer based WBM had been lost while drilling fractured limestone and vertical fault zones on the 6" interval of the well.

Operator had exhausted all conventional LCM options with the fluids company, with no success. This resulted in a cement plug being set on the previous interval, before drilling to TD (total depth) and running the casing. The Operator encountered the same type of total loss scenario when drilling ahead on the subsequent 6" interval and then decided to request Dosco PetroServices to provide an alternative LCM solution.

A two-pronged LCM strategy was developed to deal with both the total loss scenario anticipated to be encountered from the karstified vertical fault zones with the product Stoploss. And a Fraseal LCM program to deal with continuous losses while drilling ahead. The second part included the use of sweep pills pumped on the fly while drilling and also larger volumes of the same Facseal LCM pill formulation spotted on bottom when the loss rate exceeded an acceptable rate of losses > 10 m3/hr.

Actions taken

The loss zone was located at a depth of 3,436 mMD in a suspected vertical fault zone. At this depth, it was not possible to pass, and the Operator had been stuck for a prolonged period while troubleshooting alternatives to solve the problem and allow drilling to continue.

A specific LCM strategy was developed to manage the risks from the heavy losses in a way that would enable drilling to continue. It was agreed to start preparations for the application of a Stoploss LCM pill at a concentration of 95 kg/m3. Prior to taking this decision, an attempt was made to RIH and continue drilling on two occasions. In both instances, conventional LCM with CaCO3 had been pumped without success. On the second attempt, the high concentration of coarse CaCO3 had caused a number of the drill collars and the drill bit to plug and the BHA was POOH.

A concentration of 95 kg/m3 was selected for the application based on the scale of losses and the suspected type of thief zone. The plan was to mix a volume equivalent to two pumpable pills. This provided for a second pill to help plug the thief zone, which was believed to require a large volume of LCM material to finally stop the losses.

A total volume of 30 m3 of the LCM was pumped to cure the losses that were encountered.

A separate 35 m3 tank was used for the mixing and storage of the Stoploss LCM pill slurry. For the pumping operation, it was advised to use the cement unit in order to isolate the LCM application from the rig pumps.

The first two LCM pills were pumped in quick succession. After pumping the first pill and observing decreasing loss rate, the BHA was pulled up to the last casing shoe and the well monitored while using the ECD to squeeze the pill into the formation. The loss rate was observed to reduce by 50%. Prior to pumping the second pill, a 5 m3 Fracseal LCM pill was pumped ahead and the loss rate evaluated. It was then lined up to the cement unit for spotting the second Stoploss pill 50 m off bottom and the BHA pulled out to the casing shoe for a hesitation squeeze to force as much of the pill as possible into the loss zone.

Maximum pressure achieved during the hesitation squeeze was 10 bar. The loss rate after finishing the LCM application was recorded as static. A third LCM pill was prepared and pumped 16 hours later to further strengthen the bridge inside the loss zone. The same procedure as for the second pill was followed by pulling up to the previous casing shoe to perform the hesitation squeeze. The pill was spotted with 700 lpm, and final pressure recorded as holding at 10 bar. After re-establishing circulation at 700 lpm, the well was monitored and found to be stable. The total volume pumped to cure the losses was 30 m3 LCM material indicating a large loss zone taking a large volume before effectively plugging back deep into the loss fracture network.

TD for the interval was based on passing the loss zone with a target for casing setting point in the deeper and more compact limestone. The losses continued to cause problems for the operation. A combination of Fracseal based sweep pills pumped on the fly and larger volumes of the same LCM pill spotted on bottom were used to successfully manage the losses and allow drilling to section TD without the requirement for long delays or trips out of hole.

Results of the LCM strategy

The use of Stoploss cut down significantly on the NPT related to curing the losses and enabled drilling to continue. A total of 130 m3 LCM material was pumped downhole on the operation in attempts to cure the total losses at depth 3,436 m. The Stoploss volume of this total was 30 m3, pumped as 3 separate LCM pills at a concentration of 95 kg/m3 each. In comparison, the other LCM formulations which were tried unsuccessfully had concentrations between 376 kg/m3 to 440 kg/m3.

The Fracseal strategy for managing losses while drilling was able to get the Operator to target TD without unnecessary disruptions to the operation caused by long delays to deal with curing losses. No further total loss scenarios were intercepted, and the subsequent casing run operation for the 6" interval was run with no major issues reported.

KREIF Starts Construction of New Cogeneration Plant at Petromidia

The Kazakh-Romanian Energy Investment Fund (KREIF) starts the construction of the cogeneration plant on the Petromidia platform, an investment that amounts around $148 million. The estimated deadline for the commissioning of the new plant is the end of July 2023.

"It is an important step in consolidating and developing the energy sector in Romania. We start to build a new production capacity at the highest technological standards, which leads to energy efficiency and environmental protection. It supports the reduction of imports and the increase of energy exports in the region, but also the consolidation of electricity production and distribution in the Dobrogea region." - **Virgil Popescu, Minister of Energy.**

"It is an important step in consolidating and developing the energy sector in Romania. We start to build a new production capacity at the highest technological standards, which leads to energy efficiency and environmental protection. It supports the reduction of imports and the increase of energy exports in the region, but also the consolidation of electricity production and distribution in the Dobrogea region. At the same time, it will be able to use and transform the natural gas extracted from the Black Sea into finished products, with high value and which can be exported (extra energy, fuel production and other petroleum products)," declares Virgil Popescu, Minister of Energy.

Established in October 2018, KREIF is owned by KMG International and the Romanian State through the Administrare a Participatiilor in Energie (Energy Participation Management Company) – SAPE company. At the same time, the two shareholders - KMGI and the Romanian State through the Ministry of Energy are also present in such companies as Uzina Termoelectrica Midia and Rompetrol Rafinare - the operator of the Petromdia Navodari and Vega Ploiesti refineries, the single polymer producer in Romania.

The new unit for combined production of electricity and heat will operate on natural gas basis as the main fuel, the mix of necessary resources being provided in proportion of 25% of the technological process of the refinery and 75% of the national network.

Through the technical configuration (two Siemens SGT-750 turbines of high efficiency and performance and two heat recovery boilers), the new plant will generate approximately 80 MW of electricity - of which about 60-70 MW will fully cover the electricity needs of the Petromidia platform, technological steam of up to 180 tons/hour, plus the necessary hot water for the heating system of Navodari - up to 20 MWt/hour. The project will generate about $ 11 million in taxes paid to the state budget each year.

Through the programs of modernization and efficiency of the units and production flows within the Petromidia refinery, KMG International aims to reduce constantly the electricity consumption. Thus, the surplus generated by the new plant will be sold on the domestic market and will provide additional revenue for the investment vehicle (SPV) - Rompetrol Energy.

Rompetrol Energy is the majority owner of the Kazakh-Romanian Energy Investment Fund, together with Rominserv and the Uzina Termoelectrica Midia.

At the same time, the plant will allow a significant reduction in the price of electricity delivered to the Petromidia platform - by eliminating part of the regulatory tariffs (e.g.,

"The new plant will contribute to the development of refining activities by improving processing costs, reducing the carbon impact and footprint from the industrial platform, and creating the necessary premises for new investments," - **Beimbet Shayakhmetov, CEO of KMG International.**

transmission and distribution tariffs) and the price of thermal energy delivered to the city of Navodari. It will also support the Group's carbon reduction targets generated by production activities, and thus allow an annual reduction of about 290kt CO2 for electricity production and a saving of energy resources used of about 1.2 MWh.

"The start of the construction of the new plant reconfirms KMG International's commitments to continue to be a strategic investor in Romania, to support the energy sector and the national economy, and what more to be an important supplier of petroleum products in the region. The new plant will contribute to the development of refining activities by improving processing costs, reducing the carbon impact and footprint from the industrial platform, and creating the necessary premises for new investments," stated Beimbet Shayakhmetov, CEO of KMG International.

In August 2020, the Investment Fund selected Calik Enerji as the general contractor of the project (Engineering, Procurement and Construction), based on an extensive evaluation and selection process depending on the capability of the companies, which expressed their interest (similar projects carried out in the last 10 years - minimum 3 projects, the existence of ongoing projects, a solid financial situation, letters of recommendation, qualified staff, etc.), as well as the criteria and technical proposals, as well as their financial offers.

It is a brownfield type of investment, which will integrate the assets of Uzina Termoelectrica Midia, as well as its staff for the operation of the existing equipment and the new plant. Starting this year, a series of stages were carried out prior to the actual start of the project - land preparation, geotechnical study, obtaining/updating specific permits/authorizations for the demolition of old buildings, organization of the site and environment.

The project will also involve the performance of additional works to ensure the raw material, such as the construction of a new pipeline of approximately 4 km, an installation for compression, filtration, heating, and mixing, but also 2 gas measuring units (SRM). According to estimates, over 20% of the budget allocated to the project will be assigned to Romanian companies for various products/equipment and services/works.

The Kazakh-Romanian Energy Investment Fund was established in October 2018 by KMG International and the Societatea de Administrare a Participatiilor in Energie, its main and strategic objective being the development of energy projects in Romania.

Another important project of the Fund aims at developing a network of 84 fuel stations in Romania, which will sell exclusively car fuels produced by the Petromidia Navodari refinery. These fuel stations will ensure a consolidation of the profile market and fuel supply, supporting both an increase in revenues to local and central budgets, and the creation of over 1,000 new jobs, over 5,000 people involved in various stages of development (design, execution, construction) and over 1,200 business partners. The total value of the investment is estimated at about $120 million.

Currently, the network amounts 30 fuel stations, of which 10 units were completed and opened during last year.

Also in 2020, two other projects were approved, aiming at modernization of the Petromidia refinery, but also consolidation of the single polymer producer (the raw material for medical protection products such as sanitary and surgical masks FFP1 and FFP2, as well as medical accessories such as caps, coveralls, etc.).

The projects' value amounts $43 million and consists of the construction of a dewaxing installation on the Petromidia platform, which will allow the refinery to improve the process of obtaining diesel fuels during winter and increase the production of special aviation fuel, as well as to increase by more than 30% the polymer production, by converting the high-density polyethylene (HDPE) installation into a polypropylene (PP) installation.

Currently the total amount of KREIF's investments in energy projects is $311 million. ■

FLOWSERVE

Choose the Flowserve SIHI equipment!

Customer Trust Remains the Focus of Our Commitment

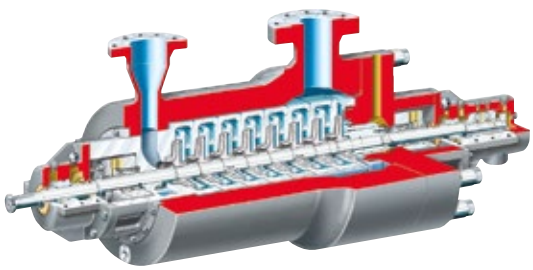
Using our resources and collective experience, we support our customers, at global level, to exceed their business targets. We fulfil this promise by the careful way in which we listen to customer requests and subsequently by delivering the products and services they need.

Our strengths

- A business model underscoring the advantages for customers, such as: predictable/low maintenance costs and increased reliability.
- The large number of customers, proof of increased productivity, optimization of equipment maintenance and repair costs, contributing to obtaining competitive positions in their markets.
- We expand technological innovations whenever possible, with the aim to improve our ability to meet the needs of our customers.
- We are open to new challenges and potential projects, which we will approach with the particularly successful team of Flowserve SIHI.
- Starting on 14th April 2017, the name of our company has changed from Sterling Fluid Systems (Romania) to Flowserve SIHI Romania - the only official entity of Flowserve SIHI Corporation for Romania and Moldova.

FLOWSERVE
SIHI® Pumps

Flowserve SIHI România SRL
105-107 Mihai Eminescu
RO-020074 Bucharest
Tel.: + 40 21 211 76 78
Fax: + 40 21 210 82 87
www.flowserve.com



WIK Pump - according to API 610 (BB5) Standard

Experience In Motion

flowserve.com

Energy Sector in Q1

Declining Results for Oil and Gas Companies

After an extremely difficult year for everyone, companies have presented the financial results for the first quarter of this year, one which all analysts see as one of economic recovery. As regards oil and gas companies, but also the energy sector in Romania as a whole, things don't seem so dramatic as one could expect a year before, when the entire planet went into lockdown.

by **Daniel Lazar**

OMV Petrom posted a net profit by 32% lower

From the reports of OMV Petrom Group, including the unaudited simplified consolidated interim financial statements as of 31 March, show that the rapid measures and the integrated business model have partially offset the challenging environment. Therefore, the Clean CCS operating result of RON 0.7 billion was by 33% lower and the Clean CCS net income attributable to OMV Petrom stockholders of RON 0.5 billion plunged by 32% compared to the similar period of last year. The Cash flow from operating activities of RON 1.2bn was also by 15% lower; CAPEX, of RON 0.6bn, fell by 40% and the Free cash flow after dividends, of RON 0.4bn, surged by 212%.

In Upstream, the Clean Operating Result was RON 311mln, compared to RON 157mln in Q1/20, mainly due to higher oil price and lower total costs. Production decreased by 7.6%, due to natural decline in main fields and lower investment level in 2020. In turn, production cost increased by 15% to USD 12.5/boe, driven by lower production available for sale and unfavourable FX, partly compensated by ongoing cost optimization.

In Downstream Oil, Clean CCS Operating Result was RON 308mln, down 40%, reflecting the weaker margins environment, as well as the high base effect due to one-off revenues in Q1/20. The refining margin indicator reached USD 2.80/bbl, down 58%, as a result of falling product spreads, while the refinery utilization rate stood at 95%, above European refineries' average. Retail volumes were flat compared to the similar period of the previous year, mainly on recovering demand, particularly in Romania.

In Downstream Gas, the Clean Operating Result of RON 181mln was by 23% higher than in Q1/20, reflecting the better performance of both the gas and power businesses. Gas sales volumes down by 23%, in part due to a high base effect from regulatory-driven sales in Q1/20. Net electrical output, of 1.18 TWh, was 6% higher, on supportive spark spreads.

Romgaz, increasing quantity of gas delivered

Romgaz recorded in the first quarter of 2021 a turnover of RON 1,327.2 million, falling by 7.21%, respectively RON 103.1mln, compared to that posted in the first quarter of 2020. However, the quantity of gas delivered was by 14.12% larger in Q1/2021 than in Q1/2020. This year, Romgaz collected part of the impaired receivables at the end of 2020, which led to a net gain from the impairment adjustments of RON 31.6mln, and the expenses with the windfall tax decreased compared to Q1/2020 by RON 63.9mln.

In the first three months of this year, Romgaz registered an additional provision for the acquisition of greenhouse gas emission allowances of RON 67.3mln, as a result of the increase in the price of these allowances compared to the estimate taken into account in December 2020.

The consolidated net profit of RON 463.8mln was by 18.91% lower than in the similar period of the previous year, which leads to net consolidated earnings per share (EPS) of RON 1.2. The achieved margins of the consolidated net profit (34.9%), consolidated

EBIT (41.3%) and consolidated EBITDA (52.4%) decreased slightly as compared to Q1/2020 (40.0%; 46.8% and 57.0% respectively) but maintain a high rate.

Natural gas consumption estimated nationally for Q1/2021 was 49 TWh, approximately by 6% higher than the consumption recorded in Q1/2020, and gas production was 1,311.5 million cubic meters (mcm), by 3.7% or 50.8mcm below that recorded in Q1/2020.

Gas production recorded in the first quarter of 2021 was 1,311.5mcm, by 3.7% lower than that recorded in the similar period of the previous year. The production level in Q1/2021, relatively high considering that every hydrocarbon production company records a production decline, was supported by: continuous rehabilitation projects for main mature gas fields, mitigating production decline in such fields; performing recompletion operations in wells that led to reactivation of several wells with important flow rates.

These results were obtained given that: the import of natural gas entered consumption was about 9.66 TWh, 6.7% higher than the same period last year; from the gas stocks of Romgaz in the underground storage facilities by 150% more was withdrawn than in the same period of 2020.

The estimated national gas consumption for Q1/2021 was 49.13 TWh, about 6% higher than that recorded in Q1/2020, of which approx. 9.66 TWh was covered with imported gas, and the difference of 39.47 TWh with gas from domestic production, in which Romgaz participated with 18.14 TWh, accounting for 36.92% of national consumption and 45.96% of the consumption covered with domestically produced gas. Romgaz's market share increased by 2.5% as compared to Q1/2020.

Electricity supplied amounted to 185.8 GWh, by 22.67% lower than for the similar period of last year (240.3 GWh) and electricity production reached 202.1 GWh, by 21.96% lower than production in the similar period of last year (258.9 GWh), the difference against the electricity supplied into the National Power Grid representing own technological consumption of the power plant.

Oil Terminal, net profit by 58.5% higher

Oil Terminal posted, in the first quarter of this year, a net profit of RON 6.341 million, 58.5% higher than in the same period last year, which was almost RON 4 million, according to the financial data submitted to the Bucharest Stock Exchange. As a result of exceeding by 4.7% the total planned revenues and due to the reduction by 2.2% of the total expenses, in the first three months of 2021 the company had a gross profit in the amount of RON 7.359 million, higher by RON 3.069 million, compared to the approved gross profit, in the amount of RON 4.29 million. The company's net turnover was RON 47.828 million, revenues totalled RON 48.329 million and expenses - RON 40.97 million. On March 31, 2021, Oil Terminal had assets of RON 563.221 million and debts of RON 108.238 million, of which RON 25.115 million current debts. Oil Terminal has a strategic position in the Black Sea region, being the largest operator by sea, specializing in handling crude oil, petroleum products, liquid petrochemical products and other liquid products and raw materials, for import, export, and transit.

Oil Terminal is one of the oldest Romanian companies in the oil industry. It was set up in 1898, part of the most modern refinery in Europe at the time, 'Steaua Romana'. The company was listed at the 1st category of BSE, on January 30, 1998. Its shareholders are the Romanian state, through the Ministry of Economy, with a 59.6222% stake, Dumitrescu Sebastian Valentin with 16.7346% and others.

Conpet posted a 3.7% lower turnover

The net profit of Conpet fell by over 41% in the first quarter of this year, to RON 9.55 million, as the turnover, which decreased by 3.7%, to RON 101.75 million, from RON 105.71 million in the first three months of 2020. "The total quantity transported during January - March 2021 was lower by approximately 199,000 tons compared to the same period of 2020, of which: 130 thousand tons on the import transport subsystem (2021 Q1: 834 thousand tons; 2020 Q1: 964 thousand tons), and 69 thousand tons on the domestic subsystem (2021 Q1: 805 thousand tons; 2020 Q1: 874 thousand tons). Within the first three months of 2021, the rail transport volumes amounted to 35% (282 thousand tons of crude oil) out of the total product throughput (crude oil, rich gas, condensate) coming from the domestic production which have been delivered to the refineries," reads the report of the company.

In the first three months of 2021, Conpet made investments amounting to RON 11.89mln, the program for this year comprising mainly rehabilitation works of the main transport pipelines and modernization works of the installations and equipment related to the National Petroleum Transport System. The investment projects aim at increasing the efficiency of the transmission activity, as well as the safe operation of the National Transport System. Conpet holds a monopoly position in the market of crude oil transport through pipelines, OMV Petrom being the client with the largest share in the company's transport revenues (81.2%). The pipeline transport system has a length of approximately 3,800 km, of which 3,161 km of pipelines are currently used for the transport of crude oil, gasoline, and condensate.

Transgaz revenues fell by 11%

In the first quarter of this year, Transgaz's operating revenue before the balancing and construction activity, according to IFRIC12 decreased by 11% as compared to Q1/2020,

recording a decrease by RON 57,013 thousand. Operating costs before the balancing and construction activity according to IFRIC12 increased by 1% in Q1/2021 as compared to Q1/2020, their level being by RON 3,669 thousand higher. Compared to the achievements in Q1/2020, the gross profit obtained in Q1/2021 decreased by 19%, respectively by RON 45,556 thousand. The variation of the consolidated economic and financial indicators on March 31, 2021, compared to those achieved in the similar period of 2020 is mainly determined by the variation of individual economic and financial indicators recorded by Transgaz on March 31, 2021, compared to those achieved in the similar period of 2020.

Electrica revenues increased by 2%

Electrica Group obtained, in the first quarter of 2021, a consolidated net profit of RON 58 million, registering a reduction of RON 22 million, respectively 27.7%, compared to the same period of the previous year, and the consolidated EBITDA reached the value of RON 199 million, decreasing by RON 25 million compared to the value in the first three months of 2020. The reduction in EBITDA was mainly due to the evolution of the supply segment, amid the increase in electricity purchase prices, as well as non-recurring positive elements in the first quarter of 2020.

The total revenues of Electrica Group, in Q1/2021, amounted to RON 1,729 million, representing an increase by 2% compared to the same quarter of the previous year. In the supply segment, revenues were higher by 4.5%, while in the distribution segment revenues decreased slightly, by 0.4%. Consolidated costs for the purchase of electricity and natural gas increased by 9.9%, to RON 1,140 million, in the first three months of 2021, this evolution being generated mainly by the supply segment, where costs increased by approximately RON 120 lei, or 15%, especially from the increase in electricity purchase prices, following the complete liberalization of the electricity market, correlated with the non-recurring effect in 2020 consisting of recovering the differences of electricity purchase costs on the regulated segment supply, from the periods prior to the previous year. Regarding the distribution segment, the evolution of costs with the purchase of electricity to cover network losses had a favourable effect on consolidated costs, of RON 18mln or 7.4%.

Nuclearelectrica, revenues growing by 0.8%

The revenues realized by Nuclearelectrica on the electricity market related to electricity deliveries in the first quarter of 2021 were RON 683,746,453 (of which RON 43,857 represent redistributed revenues resulting from the balancing of the system), higher by 0.8% compared to budgeted revenues for the first quarter of 2021 and respectively 9.1% higher than the achievements in the first quarter of 2020. The weighted average selling price for the electricity quantities sold (without the regulated market), resulted in Q1/2021, is RON 249.25/MWh. Therefore, the EBITDA indicator increased by 10%, to almost RON 420mln, and the net profit climbed by 9%, to RON 234mln. The electricity quantities sold on the competitive market of bilateral contracts accounted, in Q1/2021, for 81.45% of the total volume of electricity sold, compared to 39.7% in Q1/2020.

The average sale price for bilateral contracts in this period was RON 247.50/MWh (Tg included), representing a decrease of 8.4% compared to the average price recorded in the first quarter of 2020, of RON 270.13/MWh (Tg included); given that the value of the transportation fee for introducing electricity in the network Tg has remained unmodified since January 2020 (1.30 RON/MWh according to ANRE Order no. 218/11.12.2019). On the spot market (DAM and IDM), in the first quarter of 2021, a quantity of electricity representing 18.26% of the total sale volumes was sold, as compared to the percentage share of 35.4% recorded in the first quarter of 2020. The average energy selling price on the spot market (DAM and IDM) achieved in the first quarter of 2021 was RON 257.05/MWh (Tg included), compared to RON 184.14/MWh (Tg included) recorded in the first quarter of 2020.

Transelectrica improved its profit

In the first quarter of 2021, Transelectrica registered an improvement in terms of business profitability compared to Q1 2020. Thus, the gross profit increased from RON 92 million in January-March 2020 to RON 94 million in January-March 2021, an increase mainly due to the reduction of all operating costs including depreciation, as well as efficient management of available resources in the company's accounts. The total operational revenues increased by 20% compared to the same period of the previous year (RON 726 million compared to RON 603 million), mainly due to the increase in the amount of electricity delivered to consumers, the increase in the average transmission tariff and the increase in revenues realized on the balancing market. Compared to the same period of the previous year, the total amount of electricity transported increased by about 4% (14.93 TWh compared to 14.41 TWh) at the same time as the increase in expenditure on own technological consumption, which was higher by RON 29mln compared to the first quarter of 2020, mainly due to the average price of energy purchased on the Balancing Market, which increased by about 11% in January 2021 compared to the similar period of the previous year (from RON 421.85/MWh to RON 472.29/MWh), in the context of important changes in the balancing market starting with September 1, 2020, with the entry into force of ANRE Order No. 61/2020. ■

Kraftanlagen Romania
A member of Bouygues Construction

ipip S.A.
A member of Bouygues Construction

Kraftanlagen Romania S.R.L. was founded in 2007 as a subsidiary of the German company Kraftanlagen München GmbH and expanded its local services successfully in 2016 with IPIP S.A.

We engineer, design and build complex piping and plant systems for the chemical and petrochemical industry. Our technical competence covers also requirements for new plants and maintenance for refinery, extraction & production and industrial plants.

The range of our solutions:

- Feasibility, process studies
- Basic design and front end engineering design
- Multidisciplinary detailed engineering
- Technical documentation for authorities
- Project management
- Technical assistance for commission, start-up, test run, guarantee test
- Supply and installation of all pipelines and brackets
  Basic and precision installation of all components, such as devices, columns, pumps and compressors
- Steel construction
- Installation of cracking and reaction furnaces
- Tank farm construction
- System integration, operating checks and commissioning
- Plant revisions
- Pipeline and bracket corrosion protection
- Insulation
- Scaffolding

Plastics: A Modern Curse that Needs to Be Lifted

It is a fact that if human civilization was ever to be wiped out of the face of the Earth, there would be a very easy way to tell our story and that an intelligent life form walked on our planet: plastics.

by **Konstantinos Michalopoulos**

The production of plastics has escalated very rapidly over the years. From the 1950s until today about 8.4 billion metric tons of plastics have been produced with half the volume made since 2004. Given the fact that plastics are not fully recyclable and do not degrade naturally, these huge volumes are piling up on landfills, the ocean and even float in the form of microplastics in very air we breathe.

While salt and sunlight can cause plastics physically to break apart into smaller pieces, chemically the hydrocarbons linked together into the polymer chains of which plastics are made do not spontaneously decompose into other compounds. Much like crude oil they decompose only if they are burned at a high temperature to release mainly carbon dioxide and water. In all other circumstances, plastics simply accumulate in the environment, as carbon dioxide does in the atmosphere. This way about 11m metric tons of plastics enter the seas each year, and without drastic action this amount could nearly triple by 2040. Most plastic packaging is used only once, and just 14% is collected for recycling every year, with tens of billions of dollars' worth of plastic packaging material lost to the economy.

But before presenting the philosophy and mindset behind the basic pillars that - in our opinion - form a strategy of tackling this issue we believe that we should take a quick look to basic drawbacks.

1. You cannot manage what you cannot measure. The first step is to gather data. In fact, many companies in the consumer-goods industry do not know what their plastics footprint actually is, therefore they have no strategy to reduce it.
2. Products that are designed only to be used without taking into consideration their ultimate disposal. Companies should be in a position to design products that contain less plastic, using materials with a lower carbon footprint and easy to process. Products for which plastic is the best material should be designed for reuse or use polymers that are easy to recycle.
3. Lack of recycling infrastructure and circular economy mindset. One major issue is cost for plastics recyclers which they find it hard to compete with producers of virgin plastic: challenges include consistency in the supply and quality of materials, and the costs of collecting and processing waste plastic.
4. Change doesn't happen due to lack of collaboration of all players (governments, plastic producers, recyclers and consumers). Even major players cannot act alone and actually consumers may be a barrier to change because although they are aware of plastic-waste issues, more research is needed to test how much change in products they are willing to accept and how much they are willing to pay for different packaging. In fact, consumer demand for plastic packaging increased during the covid-19 pandemic, with consumers preferring packaged over loose foods, for example.

When you surf the web these days you may find out that there are thousands of different ways described in detail in order to mitigate the use of plastics in everyday life that pretty much sum up to the below four interconnected pillars:

Reduce

To efficiently reduce plastics pollution, there is a

Plastic waste on a beach in Panama City. Research shows that 4.4 million to 8.8 million tons of plastic enter the sea every year. Credit: Luis Acosta/Agence France-Presse — Getty Images

need of reducing our usage of plastic. It means that changing our everyday behaviours and not use plastic when there is a better alternative to it and only using plastic when strictly necessary.

Reuse

Plastic can cause pollution if poorly managed, but it has lots of advantages too, such as being resistant. Many plastic products can serve us more than one times before finding their way to the garbage bin. Therefore, before throwing away plastic items, it is important to consider how they can be reused.

Recycle

Plastics recycling consists of collecting plastic waste and reprocessing it into new products, to reduce the amount of plastic in the waste stream.

Educate

Maybe the most crucial solution is education aiming to increase awareness and behavioural change.

Leaving aside all the technicalities and bold solutions proposed in various ways about the growing problem of plastics, the most important fact is that individuals are the first line of defence. The goal should be to prevent plastics ending up in the garbage the wrong way and this can only be achieved if people are fully aware of the impact their consumer behaviour has on the environment, their quality of life, even their children's and grandchildren's quality of life. Earth is undeniably becoming a planet of plastics with a rhythm that was further accelerated disproportionally in the past two years, since the COVID-19 pandemic has spiked the demand for plastics in all aspects of everyday life.

We need to realize that the victory towards this enemy won't come overnight, it won't come easy and actually the effort should start from each one of us, by changing our habits: each person, each town, each country at a time.

At the end of the day, when we look at the mountains of plastic waste piling around us, we must realize that before they end there, they were in fact, in people's hands. ■

Ursula von der Leyen and Bill Gates Committed to Boost Investments in Clean Technologies for Low-carbon Industries

European Commission President Ursula von der Leyen and Bill Gates announced a new partnership to boost investments in the critical climate technologies that will enable the net-zero economy. This partnership between the European Commission and Breakthrough Energy Catalyst aims to mobilise new investments of up to €820 million/$1 billion between 2022-26 to build large-scale, commercial demonstration projects for clean technologies – lowering their costs, accelerating their deployment, and delivering significant reductions in CO_2 emissions in line with the Paris Agreement.

The partnership intends to invest in a portfolio of high-impact EU-based projects initially in four sectors with a high potential to help deliver on the economic and climate ambitions of the European Green Deal:

- Green hydrogen;
- Sustainable aviation fuels;
- Direct air capture;
- Long-duration energy storage.

In doing so, it seeks to scale up key climate-smart technologies and speed up the transition towards sustainable industries in Europe.

"With our European Green Deal, Europe wants to become the first climate-neutral continent by 2050. And Europe has also the great opportunity to become the continent of climate innovation. For this, the European Commission will mobilise massive investments in new and transforming industries over the next decade. This is why I'm glad to join forces with Breakthrough Energy. Our partnership will support EU businesses and innovators to reap the benefits of emission-reducing technologies and create the jobs of tomorrow," Ursula von der Leyen, President of the European Commission, said.

"Decarbonising the global economy is the greatest opportunity for innovation the world has ever seen. Europe will play a critical role, having demonstrated an early and consistent commitment to climate and longstanding leadership in science, engineering, and technology. Through this partnership, Europe will lay solid ground for a net-zero future in which clean technologies are reliable, available, and affordable for

all," Bill Gates, Founder of Breakthrough Energy, added.

The European Commission-Breakthrough Energy Catalyst partnership will target technologies with a recognised potential to reduce greenhouse gas emissions, but which are currently too expensive to get to scale and compete with fossil fuel-based incumbent technologies. The world cannot wait for technologies to develop on their own. By bringing together the public and private sectors to invest in large-scale demonstration projects, the partnership will help lower the costs of these critical technologies, accelerating their take-up and use. It will help turn scientific leadership into the foundation of the sustainable industries of the future. Support will take the form of financial instruments and grants.

EU funding for the partnership is envisaged from Horizon Europe and the Innovation Fund within the framework of InvestEU, according to the established governance procedures. The Breakthrough Energy Catalyst Programme will mobilise equivalent private capital and philanthropic funds to finance the selected projects. The partnership will also be open to national investments by EU Member States through InvestEU or at project level.

The Catalyst Program - Accelerating the Deployment of Clean Technologies

The Catalyst Program, which would provide a platform for rapidly commercializing emerging technologies, would significantly decrease the price of new clean products, increase their availability in the market, and demonstrate how to finance the infrastructure of decarbonization at scale.

Catalyst would start by focusing on four critical technologies for decarbonization: Green hydrogen; Sustainable aviation fuel (SAF); Long-duration energy storage (LDES); Direct air capture (DAC).

These clean innovations have already proven their potential at a small scale, but right now, the timelines for their development are still way too long. They are at the critical turning point where an influx of capital can turn them into viable commercial products much more quickly – the catalytic stage.

Background

The EU is supporting a range of partnerships under the Horizon Europe programme (building on those supported under previous EU research and innovation programmes), which mobilise private funding to deliver on pressing global challenges and modernise industry through research and innovation. A €100 million investment fund established with Breakthrough Energy Ventures in 2019 has yielded promising investments across major energy-related sectors where efforts are essential in fighting climate change.

Breakthrough Energy intends to join forces with existing EU programmes such as Horizon Europe and the Innovation Fund to finance the new partnership, which will be implemented by the European Investment Bank and other interested financial institutions under the InvestEU programme.

A call for expressions of interest for potential InvestEU implementing partners is currently open until 30 June 2021. The Commission is organising a public information session before this deadline in order to present the opportunities of the Catalyst partnership. ■

Europe at the Top of Hydrogen Electrolyser Projects

According to Aurora Energy Research, the vast majority of electrolyser projects are located in Europe (85%), with Germany the clear front-runner with 23% of planned electrolyser capacity globally. Germany remains the most attractive market for low carbon hydrogen investment in Europe, despite promising policies and strategies recently being released by Italy, Poland, and the UK.

Key success factors for 'green' hydrogen from electrolysers are the cost and carbon footprint of electricity. France currently offers the lowest wholesale power prices, and its grid carbon intensity is one of the lowest in Europe. However, hydrogen made directly from renewable energy rather than the power grid can achieve the lowest carbon footprint. This may be the only type of hydrogen that can meet the carbon intensity thresholds set by the EU.

The UK and Europe have set challenging targets for Net Zero emissions by 2050, involving switching energy consumption across the whole economy to zero-carbon sources. Hydrogen could play an important role in reducing emissions particularly in 'hard to abate' activities in industry, heating, and heavy-duty transport.

Since defining Net Zero targets, governments around Europe have turned significant attention to the potential of low carbon hydrogen, which can be produced either from electrolysis of water ('green hydrogen') or from natural gas with CO2 capture ('blue hydrogen'). Many governments in Europe are especially promoting electrolysers; the EU targets 40 GW of electrolyser capacity by 2030, and national governments in Europe combined have already pledged a total of 34 GW by the same date.

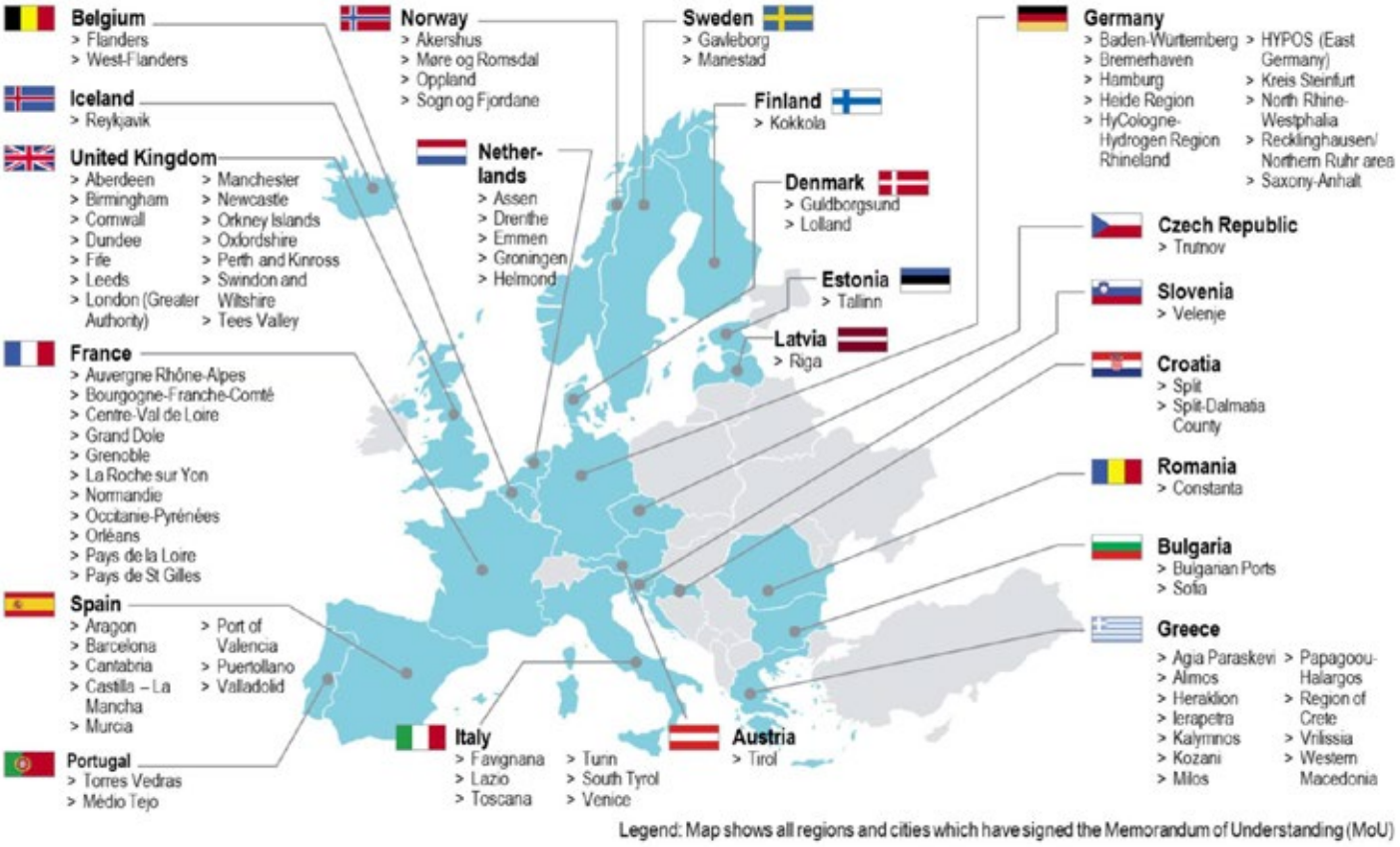
Green Hydrogen: global development pipeline and projects size is scaling up rapidly

The new report by Aurora Energy Research, highlights just how quickly companies are responding to this opportunity and developing new hydrogen production facilities. Drawing on its global electrolyser database, Aurora finds that companies are planning electrolyser projects totalling 213.5 GW for delivery by 2040 – of which 85% of projects are in Europe. Excluding the early-stage projects, which are in a conceptual planning phase, within Europe, there is a pipeline of over 9 GW in Germany, 6 GW in the Netherlands, and 4 GW in the UK, all scheduled to be operational by 2030. Current global electrolyser capacity is just 0.2 GW, mainly in Europe, meaning that if planned projects deliver by 2040, capacity will grow by a factor of 1,000.

Electrolyser project sizes are scaling up very quickly too as the technology and supply chain matures: to date most projects have been between 1-10 MWs. By 2025 a typical project will be 100-500 MWs, typically supplying 'local clusters', meaning that the hydrogen will be consumed locally to the facility. By 2030, typical projects are expected to scale up further to 1 GW+, with the emergence of large-scale hydrogen export projects, deployed in countries benefiting from cheap electricity.

Electrolyser project developers are exploring a range of different business models in terms of the power sources they harness, and the end user of the hydrogen produced. Of the projects that state a power source, most will be using wind power,

Fuel Cells and Hydrogen for Green Energy in European Cities and Regions



Legend: Map shows all regions and cities which have signed the Memorandum of Understanding (MoU)

followed by solar, with a smaller number of projects utilising grid electricity. A large portion of the electrolysers indicate that the end user will be industry, followed by mobility.

Hydrogen Market Attractiveness Rankings

Although Germany still offers the most attractive market for low carbon hydrogen development, in the last six months both Poland and Italy have released their hydrogen policies. Italy's is a long term, strategic policy – positioning itself as a hydrogen bridge between Africa and Western Europe – and aiming to convert 20% of final energy consumption to hydrogen-derived sources by 2050. Poland has released a policy focusing on shorter term goals, including a 2 GW electrolyser build target and a plan to introduce its own Carbon Contract for Difference scheme by 2025, which will encourage more expensive, low carbon production methods.

The success of green hydrogen from electrolysis will be driven by two key factors: the cost of the power – which makes up most of the cost; and the carbon footprint. For grid-connected electrolysers, France is expected to have the lowest grid power prices to 2040, followed by Germany. The countries with the lowest grid carbon intensity will be Norway, Sweden, and France. To achieve the lowest carbon footprint, electrolysers can bypass the grid and connect directly with renewable power sources such as wind, solar and hydro. The European Union is starting to determine carbon footprint thresholds within their laws and policies which will increasingly reserve the label of 'sustainable' hydrogen to renewable-connected electrolysers only.

On 21st April 2021, the European Commission approved a Draft Delegated Act containing a new classification for 'sustainable' hydrogen. The Draft Delegated Act of EU Sustainable Finance Taxonomy requires a reduction in lifecycle emissions of 73.4% relative to a fossil fuel comparator of 94 gCO2e/MJ, implying a limit of 3 tCO2/tH2. For hydrogen production using grid electricity, this equates to a grid carbon intensity of 53.3 kgCO2e/MWh, before considering other sources of emissions. This is a relatively low threshold, which Aurora expects only the power grids in Norway, Sweden, and France could meet by 2030. ■

EU Action Plan 'Towards Zero Pollution for Air, Water and Soil'

On May 12th, the European Commission adopted the EU Action Plan 'Towards Zero Pollution for Air, Water and Soil' – a key deliverable of the European Green Deal and the main topic of this year's EU Green Week. It sets out an integrated vision for 2050: a world where pollution is reduced to levels that are no longer harmful to human health and natural ecosystems, as well as the steps to get there. The plan ties together all relevant EU policies to tackle and prevent pollution, with a special emphasis on how to use digital solutions to tackle pollution. Reviews of relevant EU legislation are foreseen to identify remaining gaps in EU legislation and where better implementation is necessary to meet these legal obligations.

"The Green Deal aims to build a healthy planet for all. To provide a toxic-free environment for people and planet, we have to act now. This plan will guide our work to get there. New green technologies already here can help reduce pollution and offer new business opportunities. Europe's efforts to build back a cleaner, fairer, and more sustainable economy must likewise contribute to achieving the zero-pollution ambition," Executive Vice-President for the European Green Deal Frans Timmermans said.

"Environmental pollution negatively affects our health, especially the most vulnerable and socially deprived groups, and is also one of the main drivers of biodiversity loss. The case for the EU to lead the global fight against pollution is today stronger than ever. With the Zero Pollution Action Plan, we will create a healthy living environment for Europeans, contribute to a resilient recovery and boost transition to a clean, circular and climate neutral economy," Commissioner for the Environment, Oceans and Fisheries Virginijus Sinkevičius, mentioned.

To steer the EU towards the 2050 goal of a healthy planet for healthy people, the Action Plan sets key 2030 targets to reduce pollution at source, in comparison to the current situation. Namely:

- Improving air quality to reduce the number of premature deaths caused by air pollution by 55%
- Improving water quality by reducing waste, plastic litter at sea (by 50%) and microplastics released into the environment (by 30%)
- Improving soil quality by reducing nutrient losses and chemical pesticides' use by 50%
- Reducing by 25% the EU ecosystems where air pollution threatens biodiversity
- Reducing the share of people chronically disturbed by transport noise by 30%, and
- Significantly reducing waste generation and by 50% residual municipal waste.

The Plan outlines a number of flagship initiatives and actions, including:

- Aligning the air quality standards more closely to the latest recommendations of the World Health Organisation
- Reviewing the standards for the quality of water, including in EU rivers and seas
- Reducing soil pollution and enhancing restoration
- Reviewing the majority of EU waste laws to adapt them to the clean and circular economy principles
- Fostering zero pollution from production and consumption
- Presenting a Scoreboard of EU regions' green performance to promote zero pollution across regions
- Reduce health inequalities caused by the disproportionate share of harmful health impacts now borne by the most vulnerable
- Reducing the EU's external pollution footprint by restricting the export of products and wastes that have harmful, toxic impacts in third countries
- Launching Living Labs for green digital solutions and smart zero pollution
- Consolidating the EU's Knowledge Centres for Zero Pollution and bringing stakeholders together in the Zero Pollution Stakeholder Platform
- Stronger enforcement of zero pollution together with environmental and other authorities.

KAESER COMPRESOARE®

Portable Compressor for Industrial Applications (II)

Image: KAESER KOMPRESSOREN SE

The M 27E proved the perfect portable solution for UNIMATIC.

Compressed Air for FFP2 Protective Masks

From the onset of the Coronavirus pandemic, the demand for FFP2 protective masks shot up rapidly. UNIMATIC Automationssysteme GmbH, a successful manufacturer of customised assembly, production, and testing systems from the Bavarian municipality of Grub am Forst, were able to erect the necessary production systems from scratch in next to no time. Their existing compressed air supply, however, could not cope with the sudden increase in demand. Ever fast and flexible, KAESER were on hand to assist. Their unconventional solution? A MOBILAIR M 27E portable compressor with electric drive.

Insufficient compressed air supply

Alexander Raps, Managing Director of UNIMATIC, had underestimated one important aspect: "I had the big picture in view, and we had employees who could operate the systems, but there was one thing I had not considered and that was the infrastructure". In other words, the compressed air supply. In normal times, the company only runs one production cycle in which systems are tested. Furthermore, the test process does not usually take long, nor do multiple systems normally have to be run in parallel. Inevitably, this meant that the existing compressed air station could not deliver the required air demand.

"It transpired that we needed almost 1000 litres per minute, when we had only planned for 500," explains the Managing Director. Despite this setback, however, a solution was quickly arrived at. A key stage in the production process – attaching the headbands and connecting the lengths of fabric via ultrasonic welding – relied on a significant amount of cooling by means of compressed air. Air demand for this part of the process was so high that the existing supply could not cope. The combined daily output of the three production systems amount to some 150,000 FFP2 protective masks, meaning that a day's downtime results in a severe impact on the customer.

The solution: Portable and electrical

A solution was needed – and fast. "Alexander Raps contacted us and asked for our advice," recalls MOBILAIR Production Manager Ralf Hereth. "Their existing air station was designed for the demands of normal production circumstances at UNIMATIC, so it was no surprise that the delivery volume proved inadequate when additional consumers were brought into the picture." However, expanding the compressed air supply was no simple task. A general lack of space and the absence of compressed air hosing posed a considerable challenge for KAESER's experts: it was not just a matter of installing an extra rotary screw compressor.

"Some of the hurdles we encountered included the issue of space and the limited strength of the electrical connection," explains Ralf Hereth. "We needed to find a solution that could manage with a connection of 32 amps maximum, because UNIMATICS could not provide more without installing new equipment." Not only that, but this family business was located in close proximity to a residential area – which had ramifications in terms of the permissible exhaust and sound emissions. It was this factor above all that pushed thoughts of a diesel-powered portable compressor out of the running and brought into play an electric version.

"We found the perfect solution in the shape of the M 27E," Ralf Hereth, MOBILAIR Product Manage, says.

KAESER KOMPRESSOREN S.R.L.
Address: 179 Ion Mihalache Blvd.,
011181 - Bucharest
Tel.: +40 21 224 56 81
Fax: +40 21 224 56 02
Web: www.kaeser.com
Email: info.romania@kaeser.com

Talking to Experts: Teodor Chirica, PhD, Honorary President of the Romanian Atomic Forum

Graduate of the Polytechnic University of Bucharest, with a solid experience in Romania's nuclear industry, Teodor Chirica, PhD, has significantly contributed to the establishment of the Romanian Atomic Forum (ROMATOM), as co-founder, and to its affiliation to the European Atomic Forum (FORATOM), whose President he was during 2018-2019. In an extensive interview, Mr. Teodor Chirica, PhD, discusses about Romania's entry in the elite club of European professionals in the nuclear field, the implications of completing Units 3 and 4 in Cernavoda, the production of hydrogen in Romania, and the role of nuclear power in the energy mix of the future.

Text by **Lavinia Iancu**
Photo by **Justin Iancu**

Certification of Romanian experts' competencies in the nuclear industry has contributed to Romania's positioning on the European map of this field, also based on strategic nuclear projects carried out by our country. How was ROMATOM founded and how did Romania join the elite club of European nuclear power experts?

After December 1989, several professional associations started to emerge in Romania, as a result of a natural trend of the various professions and fields of activity to promote and defend their interests, aligned with similar international or European associations. In the engineering field, in 1990, the General Association of Engineers in Romania (AGIR) takes back its old name from 1918. Also, the Romanian National Committee of World Energy Council (RNC-WEC), a founding member of the World Energy Council created in 1923, and the Romanian National Institute for Energy Development Studies (IRE), re-established in 1990 and affiliated with EURELECTRIC, are two respectable associations operating in the field of electricity.

It was normal for the nuclear sector in Romania to develop its own associations, the first being the Romanian "Nuclear Energy" Association (AREN), founded in 1990 as a learned association of professionals, individuals in the field of nuclear power.

Also, on May 7, 1996, the Nuclear Union of

Romanian Industry (UNIR), was founded in Cernavoda, an association consisting of individuals, which made its voice heard, publishing statements and calls to decision-makers, documenting the proposed objectives, through numbers that proved the benefits of continuing the Romanian Nuclear Program. UNIR dissolved itself after the establishment of the Romanian Atomic Forum.

In 2000, the nuclear industry in Romania had the first contacts with the European Atomic Forum (FORATOM), an association of the European nuclear industry, bringing together the national fora of the nuclear industries in the Member States of the European Union or those in the process of accession to the European Union. FORATOM acts as the voice of the European nuclear industry in energy policy discussions with EU Institutions and other key stakeholders.

At the time, the need for an association promoting industry's interests, having the necessary strength and representativeness, consisting of individuals activating in the field of nuclear power was very clearly understood. Also, the importance for this association to operate in Bucharest, the capital of Romania, where it could have an easier access to state institutions, to media, as well as to the other energy associations, was realized.

Then, an initiative group was set-up, consisting of representatives of Nuclearelectrica (Teodor Chirica, director), Nuclearmontaj (Mihai Cornescu, director), UNIR (Horea Mocanu, secretary general) and GeneralTurbo (Dinu Vasiliu, director), legal advice being provided by Mr. Vlad Chiripus. The initiative group analysed the options, foreshadowing the new association, proposing the name of Romanian Atomic Forum (ROMATOM), defined its objectives, and prepared the first drafts of the Articles of Incorporation and Statute.

The Initiative Committee, eager to become part of the European nuclear industry as soon as possible, addressed to the FORATOM General Assembly the approval of ROMATOM accession. FORATOM answer was favourable, ROMATOM becoming a member of the European Atomic Forum on December 13, 2000. We are proud that the Romanian nuclear industry has opened the door to the European Union, as the vanguard of Romania's accession to the European family!

On January 10, 2001, Constituent General Assembly, including 16 founding members, - Nuclearelectrica, 13 companies and two associations (AREN and UNIR) founded the Romanian Atomic Forum (ROMATOM), a Romanian legal entity governed by private law, an independent union representative at national level, non-profit and non-lucrative, non-governmental, apolitical, consisting of Romanian and/or foreign legal entity members. The Constituent General Assembly approved the Articles of Incorporation and the Statute of the Association, elected the President and the Board of Directors, approving the activity program and the budget for the current year.

By resolution of the Bucharest District Court 1, following the session of May 3, 2001, ROMATOM acquired legal personality, obtaining the Certificate of registration with the register of associations and foundations at the Registry of the Bucharest District Court 1 on June 19, 2001.

Since then, ROMATOM has carried out a continuous activity, having the direct support of its members, both nationally and internationally. Within FORATOM we are represented in most Working Groups and task Forces, taking part in drafting the policy documents of the European nuclear industry, including positions addressed to European Institutions, together with EU's nuclear companies. ROMATOM has an active participation in public consultations and public debates initiated by European institutions, as well as those of national interest.

Currently, ROMATOM has 40 members, legal entities in the fields of power production, research, innovation and development, engineering and consulting, manufacturing of nuclear equipment and components, construction-erection, radioactive waste management and new applications of nuclear power.

Today, ROMATOM presidency is held by Water Tosto Bucharest, Chairing the Board of Directors, too. The other members of the Board of Directors are Automatica, Ansaldo Nucleare Romania, ICSI Ramnicu Valcea, Kinectrics Romania, Matefin and Nuclearelectrica, and as alternate members - Elcomex and Titan Echipamente Nucleare.

However, according to data published by Eurostat for 2019, Romania is among the 13 EU Member States that produce electricity in nuclear power plants, but production has fallen below that of the other countries in the region. What is the explanation?

Indeed, Romania is part of the 'European nuclear club' starting with December 2, 1996, when Unit no. 1 from Cernavoda NPP started commercial operation, with an installed capacity of 706,5 MWe, doubled in September 2007, when Unit 2 started the commercial operation of the second unit. Unit 2 from Cernavoda is still the last nuclear unit commissioned in the EU. Before Cernavoda Unit 2, other two units of 1000 MW each in Temelin, Czech Republic (2002, respectively 2003), and two in Mochovce of 440 MW each, in Slovakia (1988, respectively 2000) have been commissioned. In this entire period, production of electricity delivered into the Romanian energy system remained relatively constant, around the figure of 10,000,000 - 10,500,000 MWh.

We can therefore say that the power production from nuclear sources has neither decreased nor increased in Romania compared to other states in the Central and Eastern Europe. The situation of nuclear capacities installed and operational in the last 15 years, in the region, is the following:

1. Czech Republic, 6 nuclear reactors - 3,932 MW net, 35% of the country's electricity production
2. Bulgaria, 2 nuclear reactors - 1,966 MW net, 35%
3. Hungary, 4 nuclear reactors - 1,902 MW net, 49%
4. Slovakia, 4 nuclear reactors - 1,814 MW net, 55%
5. Romania, 4 nuclear reactors - 1,300 MW net, 18%
6. Slovenia, 1 nuclear reactor - 688 MW net, 37%

It should be noted that in the region Slovakia has two new units at Mochovce, delayed projects, Unit 3 just obtained the operating license in May 2021, and Unit 4 is closer to be operational, and Hungary is more advanced on the construction of new nuclear reactors, having a contract with ROSATOM for two VVER nuclear units of 1,200 MW each and received the construction permit from the Hungarian nuclear safety authority in the second half of 2020. Czechia, Bulgaria, Poland, and Romania have plans to build new nuclear capacities, included in the energy strategies of these states.

An example worth mentioning is France, which obtains over 70% of its electricity from nuclear power plants, and which has selected nuclear projects within the National Recovery and Resilience Plan. Do you know similar examples in Europe? What is the situation in Romania?

It is difficult to make a comparison between France and Romania, the priorities being different and hence the distribution of funds requested by the two states through the National Recovery and Resilience Plan (PNRR) is different. For example, we cannot compare the situation of railways or road infrastructure in France with Romania's situation, and our decision-makers fought a diplomatic battle for financing highways. Also, there are tight deadlines imposed by European institutions, as projects subject to NRRP should be implemented by 2026, deadline which is incompatible with Romania's nuclear projects. In France, relatively small projects were selected within the NRRP, focused on investments in new activities and upgrades, such as the development and qualification of a new production capacity for manufacturing accident tolerant fuel, these projects being able to meet the aforementioned deadlines.

I don't know other EU Member States that have selected nuclear projects for funding within NRRP.

In Romania, nuclear energy covers 18% of domestic production and 35% of total clean energy produced in the country, according to Nuclearelectrica annual report for 2020, creating 11,000 jobs in production, research, engineering, works, production of equipment, innovation, education. What would the completion of Units 3 and 4 in Cernavoda mean from this point of view?

I can add that in Romania from the commissioning of Units 1 and 2, the release of around 170 million tons of greenhouse gases (GHG) was avoided. The volume of high-risk waste is very low compared to other sources of baseload energy production, these being stored at the Cernavoda plant, in intermediate facilities and at the right time being transferred to final radioactive waste repositories.

As economic and social impact, today, nuclear industry's contribution to Romania's GDP is about EUR 590 million. Also, the completion of Units 3 and 4 in Cernavoda NPP will increase the number of jobs in the nuclear industry to around 19.000 people, mostly highly qualified staff, with a corresponding increase in the Gross Domestic Product of our country. The amount of the investments estimated until 2030 in Romania's new nuclear projects is of about RON 8-9 billion.

The new nuclear units in Cernavoda NPP, Unit 3 following to be completed

by 2030 and, respectively, Unit 4 by 2031, will contribute to consolidating Romania's security of supply, reaching the assumed environmental targets, as well as an increase in welfare of the population.

The up-dated Feasibility Study for Cernavoda Units 3 and 4, shows that the Project is financially sustainable, the cash flow requirements being met, and by refurbishment of Unit 1, we add another 30 years of operation and clean production, at a half cost than a new unit – here the economic efficiency is not too difficult to be demonstrated. Analyses made by the European Commission and other international institutions show that the life extension of nuclear units will have a significant impact on the reduction of GHG emissions, with economic benefits, in the transition period, until the resumption at large-scale of new nuclear projects. Also, studies in the USA and Europe have shown that every dollar or euro spent on the nuclear industry results in four times that investment in the broader economy.

Development of new nuclear capacities, with low carbon emissions, will contribute to the stability of the energy system, ensuring the diversification of electricity supply sources, together with the new technologies using renewable sources (RES), by taking over the decommissioning of conventional, coal-fired power plants, at the end of their lifetime.

According to Integrated National Energy and Climate Plan (PNIESC), Romania aims to reduce GES emissions by 2030 by 43,9%, compared with 2005 and to reduce its dependency on energy imports from 20,8% today to 17,8% by 2030 which is one of the lowest levels in the EU. These targets cannot be achieved without the contribution of additional nuclear power capacities. Cernavoda NPP Units 3 and 4 are envisaged in the PNIESC as pillars of energy independence and decarbonization.

It's important that in Romania there is an active "supply chain", with the experience of Units 1 and 2 from Cernavoda, ready to embark on a new nuclear project, a large part being among ROMATOM members. Even if in recent years the pace of development of the nuclear program has been reduced, many of our members are involved in nuclear projects, such as the construction of new nuclear power plants outside Romania or in ITER Tokamak experiment, being interested in advanced technologies, for example the ALFRED Project, as well as providing support for operating and maintenance services for existing Cernavoda units.

According to the analyses made by ROMATOM in 2013 and updated in 2018, investigating both ROMATOM member and non-member companies, 42 companies answered to our questionnaires, representing about 60% of the companies contacted. Most respondents have maintained and updated their quality management programs. Therefore, it was estimated that the potential participation of Romania's nuclear industry to the completion of Cernavoda Units 3 and 4 Project is evaluated at around EUR 1-1.6bn, which would account for 25-40% of the total value of the Engineering, Procurement, Construction and Commissioning (EPCC) contract. In 2018, at the update of the assessment of Romania's nuclear industry capability, ROMATOM had 33 members.

In the new policy of the European Commission known as Green Deal, nuclear power is not eliminated. From this perspective, is there a possibility to obtain competitive financing for the completion of Units 3 and 4 in Cernavoda?

At the moment, nuclear power is neither included nor excluded, its assessment in view of the criteria of not causing significant harm (Do Not Significant Harm – DNSH principle) to the environment, during its entire life, being in progress. Natural gas, agriculture and forestry are in the same situation!

Statements by European officials such as "The Commission is technology neutral, so if countries come to the conclusion that they want to use nuclear energy then the huge advantage of it is, of course, that it's emission free" sounds ungrounded in reality, if nuclear power would not be able to access sustainable financing mechanisms!

The interest of the industry is to access financing under reasonable, non-discriminatory and competitive terms, within a framework facilitating investments and sustainable development, similar to the other economic activities that fall within the DNSH criteria.

We recall that, under Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020, it "establishes the criteria for determining whether an economic activity qualifies as environmentally sustainable", in the context of adopting the climate targets for 2050, redirecting investments to sustainable projects and activities. The Regulation requires the European Commission to adopt Delegated Acts (DAs), which will establish the classification criteria (taxonomy) related to economic activities according to how they do not cause significant harm, throughout their life cycle, affecting the assumed environmental targets.

The first DA established the economic activities, selected based on DNSH analyses, according to the Report of the Technical Experts Group (TEG) on Sustainable Finance, as well as the technical annexes thereto. Regarding electricity production based on nuclear technology, TEG concluded that it is very close to 'zero' GHG emissions but declined its authority to assess DNSH throughout the life cycle of these technologies, mainly in its final part, which includes management and final disposal of highly radioactive waste. Therefore, the first Delegated Act, already published, mentions that "for nuclear power, evaluation is still ongoing, and the Commission will report the results in the context of the revision of this document".

The scientific evaluation of nuclear energy during its life cycle has been entrusted to the Joint Research Centre (JRC), which is the

scientific arm of the European Commission. The JRC report currently evaluated independently by two groups of independent experts - (i) the Group of independent experts on protection against radiations and management of radioactive waste, which operates according to Article 31 of EURATOM Treaty and (ii) Scientific Committee on Health, Environmental and Emerging Risks, within DG SANTE. In the end, JRC will issue the final Report, also considering the feed-back from the two independent groups expected by the end of June, this year.

The first DA has already been adopted by the European Commission at the end of April 2021 and will be examined by the European Parliament and the Council within the next six months. If DA survives the review process, the technical screening criteria for the environmental targets evoked by taxonomy will apply as of January 1, 2022.

For all areas still under analysis, nuclear energy, natural gas, agriculture, and forestry, one or several complementary Delegated Acts are envisaged, with a high-level political debate on the inclusion of these areas in the taxonomy. It is difficult to estimate an exact timetable at this point. An alternative would be to present these areas not included in the first DA, together with the second DA, at the earliest in October of this year. The second DA aims to establish the corresponding activities and technical screening criteria associated in relation to the other four environmental targets defined in the Regulation (EU) 2020/852. Given the delays of the program of issuing the series of delegated acts, the nuclear industry and pro-nuclear Member States insist that nuclear energy be included in the first complementary DA, envisaged for the 4th quarter of 2021.

The "revision zero" of the JRC Report "Technical assessment of nuclear energy with respect to the 'do no significant harm' criteria of Regulation (EU) 2020/852 ('Taxonomy Regulation')" was published in March 2021, and recognizes that nuclear energy does not cause significant harm, the impact of nuclear energy being comparable to hydropower and renewable energy sources when it comes to non-radiological effects, stressing that "there is broad scientific and technical consensus that disposal of high-level, long-lived radioactive waste in

deep geologic formations is, at the state of today's knowledge, considered as an appropriate and safe means of isolating it from the biosphere for very long time scales", concluding that "the nuclear energy-based electricity production and the associated activities in the whole nuclear fuel cycle (e.g. uranium mining, nuclear fuel fabrication, etc.) do not represent significant harm to any of the TEG objectives, provided that all specific industrial activities involved fulfil the related Technical Screening Criteria".

The nuclear industry is confidently awaiting the completion of this assessment, conditional on accepting that scientific arguments must prevail over subjective, political, and ideological ones, in the context of a visible rift between the Member States of the Union on nuclear energy.

For Romania, nuclear power is a strategic option for reaching the national targets in the field of energy and climate change, having an important role in ensuring energy security and decarbonization of the electricity production sector, being supported by an infrastructure that covers the entire nuclear fuel cycle. How do you see the future of this industry in Romania?

It is difficult to challenge the role of nuclear energy in the national energy mix, as part of the solution to reach the assumed targets of reduction of GHG emissions, but also as vector of supply and prosperity, under the conditions of an almost complete nuclear fuel cycle. The nuclear industry is confident in the future of Romanian nuclear energy, included in the strategic documents of the Romanian Government, but also by the political programs of the main parties in Romania.

The major projects of the Romanian nuclear field, mentioning the Tritium Removal Facility, Unit 1 Refurbishment and the completion of Units 3 and 4, all located in Cernavoda, the Final repository for low and intermediate radioactive waste (DFDSMA), which will be located in Saligny, near the nuclear power plant, the ALFRED 'demonstrator' reactor and related laboratories, under development at the Nuclear Research Institute from Pitesti, the completion of the critical ELI-NP infrastructure in Magurele, as well as the deployment after 2030-2035 of the small modular reactors (SMR) imply a local component, a capable and solid industry that will work in partnership with international companies.

Development of nuclear energy is inescapable, both in Romania and internationally, if we really want a planet with zero carbon emissions in 2050. We can see that already the targets assumed for the immediate stage, until 2030, are starting to falter, increasing year to year as we approach this target, becoming more and more unrealistic. Today we are talking about a 55% reduction in emissions by 2030 compared to 1990, while in 2014 the reduction was 40%! The subject is presented as "positive", as an "increase in ambition", but in fact it expresses a weakness, partly generated by the decline of nuclear energy.

Unfortunately, the early closure of nuclear power plants is compensated by maintaining and even construction of new coal-fired power plants (see Germany), and renewables, although indispensable in this endeavour, cannot ensure reaching the targets set, both as pace of increasing the installed capacity, and by the uncontrollable fluctuations due to the day-night alternation or weather conditions.

Nuclear power is also looming as a source of production in efficient conditions of clear hydrogen at a reduced price and can also contribute to sectoral integration. However, there are pros and cons regarding the production of hydrogen in Romania. What is your opinion?

Hydrogen is part of the solution, but like most new technologies it is idealized more than it should be, as there are still many unresolved issues that are subject of both European and Romanian debates. Unfortunately, there is a fierce policy, without solid technical argument, at the European Union level on the electricity source that would fuel hydrogen production, as well as a debate on terms, such as "renewable hydrogen", vs. "hydrogen with low carbon emissions". The differences between the two terms are minor, especially if we consider the emissions during the life cycle of renewables. It is not random that wind energy is exempt from the analysis of emissions during the entire life cycle in TEG Report!

If we look in the North Atlantic space, already in the US at the Idaho National Laboratory the technology of producing 'clean' hydrogen by high temperature electrolysis is being tested, using both thermal and electrical energy provided by nuclear power plants. In France, a report published by the French Parliamentary Office for Scientific and Technological Assessment (OPECST) warns that only nuclear and renewable energy (mainly hydro) have the dual advantage of being controllable and free of GHG emissions for hydrogen production, noting that it would cost four times more to produce hydrogen from renewable sources than from a modular reactor.

"The European Union's target to install 6 GW of electrolysers for the production of one million tonnes of hydrogen from renewables by 2024 and then 40 GW for 10 million tonnes by 2030, would require, respectively, at least 15,000 and 150,000 wind turbines, or solar PV panels covering an area of about 800,000 hectares and eight million hectares," mentions the OPECST report.

I believe that nuclear energy is one of the best partners for the hydrogen production process, in cooperation with renewable technologies, nuclear energy ensuring the necessary stability, benefiting from a high degree of availability, 24 hours a day. Another advantage for nuclear energy, which is not negligible, is the area occupied by energy sources. In France, to produce 1000 MW in nuclear plants requires a surface representing 10% of the area needed to produce the same amount of energy from solar panels.

What are the global echoes regarding the role of nuclear energy in the future energy mix, without excluding climate and energy policies and benefits?

As long as we are in the area of scientific, technical and economic arguments, without excessive ideological policies, the studies, analyses and strategies abound in arguments on the role of nuclear energy in the future energy mix, in the context of achieving environmental goals assumed by the international community, energy security and welfare of the population. I will try to briefly review the most relevant documents, presented in chronological order, coming from the Intergovernmental Panel on Climate Change (IPCC), the European Commission, the Organization for Economic Co-operation and Development (OECD) or the World Energy Council (WEC).

- Global Warming of 1.50 C° Report, IPCC/UN, October 2018, IPCC Special Report on the Impact of Global Warming to 1.5°C above pre-industrial levels, in the context of strengthening the global response to the threat of climate change, sustainable development and efforts to eradicate poverty. Regarding nuclear energy, the report concludes that by the middle of this century, most primary energy comes from non-fossil sources (i.e., from renewable sources and nuclear energy), in most paths to the 1.5°C target.
- A Clean Planet for All. A long-term strategic European vision for a prosperous, modern, competitive, and climate-neutral economy, Communication from the European Commission, Brussels, 28.11.2018. The document analyses eight scenarios for the evolution of consumption within the European Union until 2050, nuclear energy being found in each of the solutions to cover consumption. The communication reiterates the role of nuclear energy as an important component in the energy mix of 2050, estimating an installed capacity of 99 - 121 GW, representing about 15% of the mix. Maintaining this level means building new units, to replace the capacities that have exhausted their lifespan, but also a massive program of refurbishments/extensions of the lifespan of the existing capacities, which are suitable for this approach. The document is accompanied by a detailed analysis.
- Nuclear power in a clean energy system, OECD/IEA, May 2019 specifies the following: "With nuclear power facing an uncertain future in many countries, the world risks a steep decline in its use in advanced economies that could result in billions of tonnes of additional carbon emissions" and "In the absence of further lifetime extensions and new projects could result in an additional 4 billion tonnes of CO2 emissions."
- World Energy Scenarios. The Future of Nuclear: Diverse Harmonies in the Energy Transition, World Energy Council, September 2019, which concludes that "there is increasing and widespread recognition that nuclear energy will feature in the future global energy mix and make its contribution to sustainable development", nuclear energy growing in all the three scenarios analysed: Modern Jazz, Unfinished Symphony and Hard Rock.
- United Nations Economic Commission for Europe report on "The Role of Nuclear Energy in Sustainable Development" clearly explains how nuclear energy fulfils all the 17 sustainable development goals of the UN having a significant contribution to clean environment, reducing energy poverty and economic growth.

I don't think I can comment further on this topic, the solidity and probity of the developers being above any suspicions. ■

Crucea Wind Farm, First Successful M&A Achieved by Romanian State Company

The inclusion of Crucea Wind Farm into Hidroelectrica's portfolio is the first successful M&A achieved by a Romanian State company, the objective being taken over by Steag Gmbh.

On May 27th, 2021, the Minister of Energy Virgil Popescu, together with the Secretary of State George Niculescu, and accompanied by President of Hidroelectrica Bogdan Badea, and by other representatives of the authorities and of the company, visited Crucea Wind Farm in Constanta County, an objective that recently entered the portfolio of the power company. On this occasion, the Minister was presented with the control room, the turbines, as well as the transformation station related to the wind farm.

"The development of the energy system towards the green area of power generation is one of the priorities of my term as Minister. Beyond making acquisitions, very useful in diversifying the intra-company production mix, I would like to encourage Romanian companies to move decisively towards the initiation of development projects of new objectives. We are in Dobrogea, the wind gateway to Romania and the center of interest for many of our green projects. The Black Sea is also a short distance away, and I take advantage of my presence here to reiterate the Romanian State's interest in the offshore wind potential," Virgil Popescu stated.

"Hidroelectrica aims to diversifying its production objectives, a fact it has assumed through an ambitious strategy proposed to shareholders and approved by them. We want to go exclusively in the direction of green energies in terms of developing the production portfolio. We have committed to add 300 MW of offshore wind power in the coming years, but it is not our only project. We also want 300 MW in onshore wind, but also green hydrogen production capacity on the Danube, just to mention a few of our projects," President of Hidroelectrica's Management Board Bogdan Badea mentioned.

Hidroelectrica is a leader in the power generation and the main provider of ancillary services required in the National Energy System and it is a vital company for a strategic sector, with implications for the national security. Hidroelectrica has a number of 187 capacities in operation with an installed capacity totaling 6,372 MW. The company also has in its portfolio the wind farm from Crucea, with an installed capacity of 108 MW. ■

OPTIMIZING THE
OPERATION & MAINTENANCE
OF THE WORLD'S ENERGY PRODUCING INDUSTRIES

www.dietsmann.com

Dietsmann is the leading independent specialist in Operation & Maintenance services and Maintenance Engineering & Inspection for continuous-production plant. With over 40 years of accumulated know-how of plant and equipment, we serve clients in the oil & gas, conventional & nuclear power generation and mining industries. A trusted partner to improve operational output by optimizing maintenance, maximizing availability and extending life-time of machinery and installations, without compromise to quality and safety.

Contact
Dietsmann SRL
CUBIC CENTER
1B Pipera Boulevard
Jud. Ilfov
077190 Oras Voluntari
Romania

e-mail: romania@dietsmann.com

SMART MAINTENANCE SOLUTIONS
FOR CONTINUOUS-PRODUCTION PLANT

Dietsmann
Maintaining Energy

Engie and Mazda Promote Electric Mobility in Romania

Engie Romania has concluded a partnership, at national level, with Mazda Romania to promote electric mobility. Through the partnership, Engie meets the needs of Mazda customers who purchase, in the following 12 months, a Mazda MX-30 car from the partner network of authorized dealers and facilitates for them the installation, at their homes or in any other location, of an Elvi electric charging station, produced by EVBox, global leader in the production of charging stations for electric vehicles.

In addition to the Elvi EVBox charging station received as a gift, Mazda MX-30 customers can also obtain a subscription for e-mobility services, by concluding a contract for the supply of electricity from renewable sources with Engie. In this way, customers can benefit from technical assistance from Engie team, access to the e-charge network with over 160 charging points at national level, free charging for the first 3,000 km and online monitoring for the charging made.

"Decarbonization of road transport is one of the trends that are emerging more and more not only at European level, but also in Romania. Therefore, we aim to become the partner for electric charging solutions for automotive manufacturers that, in their turn, have the goal of providing their customers with integrated green products. We are glad that the partnership signed with Mazda is yet another step in this direction," said Nicolas Richard, Deputy General Manager Energy Supply & Solutions, Engie Romania.

"We want to ensure for Mazda MX-30 customers all the necessary infrastructure to enjoy and focus on the pleasure of driving and the feeling of communion with the car, central attributes of Mazda. Therefore, we chose Engie as partner and together with provide Mazda MX-30 owners with Elvi charging stations of 22 kW free of charge, to eliminate the concern of charging the vehicle when they are at home," Cristian Rigu, Country Manager Mazda Romania, added.

Mazda MX-30 is the first electric model of the Japanese manufacturer. Made under the MX emblem, the model enters the series of Mazda cars that defied the conventional and stands out with its simple and elegant exterior, freestyle doors and the dynamism instilled by the evolved version of the KODO design line. The interior, crafted with Mazda-specific artistry, includes high-quality eco-friendly materials, as well as state-of-the-art technology and connectivity that transform the driver-centred driving experience, characteristic to Mazda. The Mazda MX-30 launch version not only provides a neutral environmental footprint, but also a very high level of equipment.

In the first three months of 2021, Romania recorded an increase by 65% in purchases of electric and full hybrid vehicles compared to the similar period of last year, according to a report by the Automotive Manufacturers and Importers Association (APIA). According to the same study, 'electrified' vehicles, respectively the electric vehicles (100% and plug-in hybrid) and full hybrid ones (which also have electric propulsion without charging from an external source) have, after the first 3 months of 2021, a market share of 12.2%, which is 2.2 times higher than in the same period last year (5.5%). This growth occurs in the context in which the automotive market experienced a significant contraction, of 25%. ■

OMV Petrom and Renovatio to Develop Most Ambitious Electric Mobility Project in Romania

OMV Petrom, the largest energy company in South-Eastern Europe, together with Renovatio, the operator of the largest network of recharging stations for electric vehicles in Romania, lay the foundations of a partnership to develop the most ambitious electric mobility project in Romania. The companies will install, by the end of 2022, at least 40 fast and ultra-fast recharging stations in OMV and Petrom filling stations, in Romania.

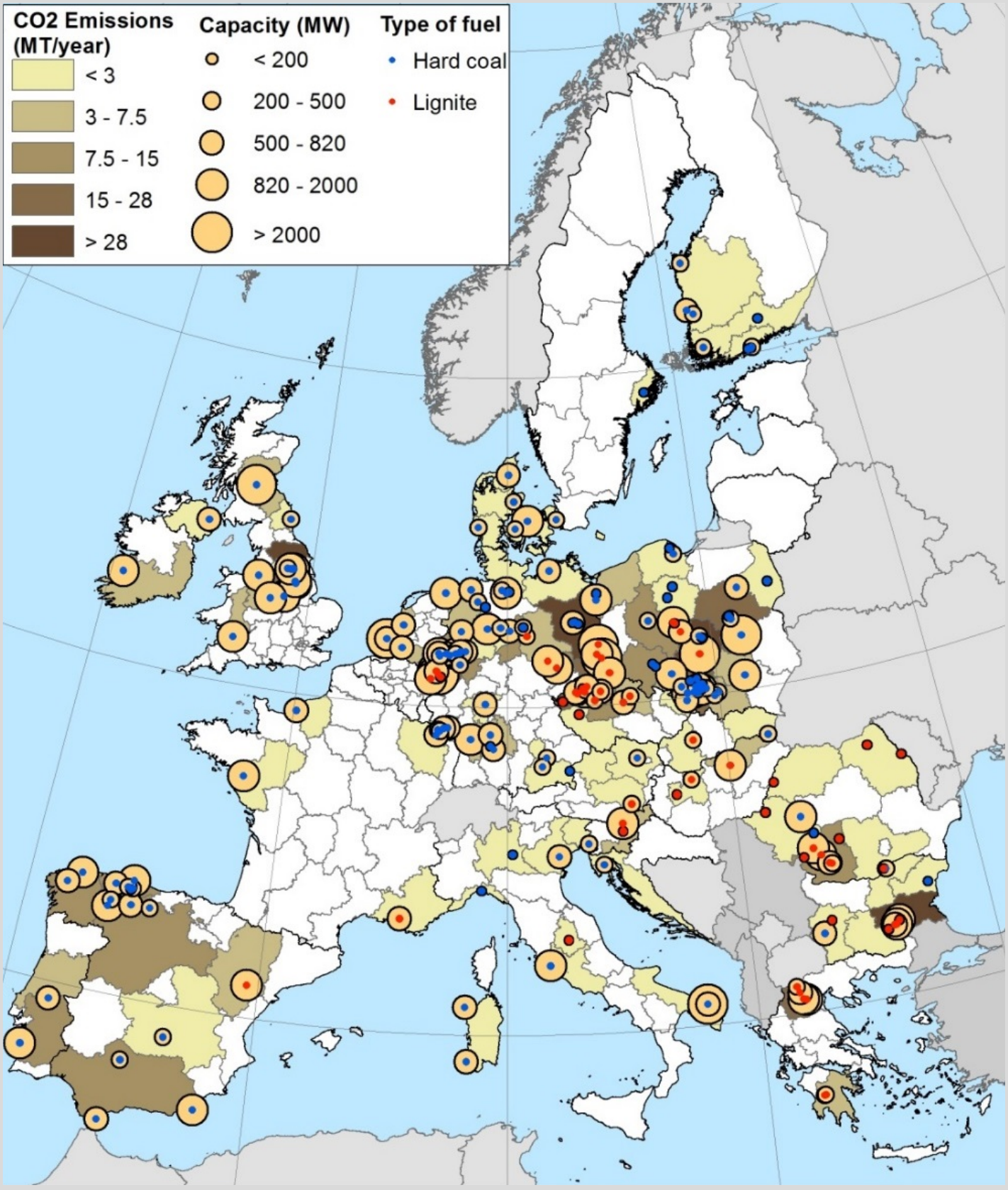
"Electric mobility represents a long-term project and meets an increasingly diverse demand for the road transportation. Lately, we see that more and more Romanians are opting for electric and hybrid vehicles. Even if, in Romania, the number of these vehicles is currently low, the prospects are for electric mobility to become a mainstream option, especially over short distances. And we are preparing to provide in the coming years the necessary infrastructure for various mobility options," Radu Căprău, member of the OMV Petrom Executive Board, responsible for Downstream Oil, stated.

"Sustainability is the concept at the core of Renovatio's business, whether we are talking about renewable energy projects, the supply of green energy to our customers or charging services for electric vehicles. We believe in electric mobility and we develop the infrastructure of fast charging stations nationwide. We have built the e-charge network for customers who are living at a fast pace, for which short charging times and the proximity of stations are a daily need. In this way, we are contributing to the European strategic goal of reducing carbon emissions to which our country has also adhered," Alexandru Teodorescu, Managing Parter Renovatio, mentioned.

All locations will have at least one recharging station with a minimum power of 50kW, and at least 20 of them will have recharging stations with an installed capacity of 350 kW right. The latter will form the largest network of ultra-fast charging stations in Romania.

An electric vehicle's battery recharging cycle varies depending on the battery's configuration and the vehicle's technological compatibility with the charging solution. The purpose of these recharging points is to allow drivers of electric vehicles to be back on the road in less than 20 minutes. The recharging stations will be located with priority along the corridors of the Trans-European Transport Network (TEN-T) in Romania, as well as in urban areas.

Four years ago, OMV Petrom was the first energy company in Romania that, as part of a pilot project, installed the first fast recharging station for electric cars, in an OMV filling station. In 2020, OMV Petrom announced that it will install, by the end of 2021, another approximately 40 recharging stations in OMV and Petrom filling stations in Romania and Bulgaria. ■



Location of coal power plants with information on capacity and fuel type; and regional CO2 emissions at NUTS-2 level.

COAL MINES IN EUROPE

A Reality We Still Need to Accept

Coal mines are not just images from 'Germinal', Émile Zola's famous novel. Although doomed to disappear due to the catastrophic impact on the environment, coal mines remain a reality in many European countries. However, coal accounts for only 15% of European Union's energy production. In the 27 Member States, 53,000 persons are working in thermal power plants and in mines - 185.000, according to the European Commission. Mines in Germany and Poland are the most active, these being supported by modern technologies and improved working conditions. And yet, according to European institutions, two thirds of coal-fired power plants must cease operations by 2030. Even if the European Union manages to spare the black ore, it will remain widely used on the continent, even only for the fact that Russia is one of the main global producers. At European level, Green Deal provides for financial support measures through the just transition facility: in the following seven years, approximately EUR 40bn will represent public and private funds to help the regions characterized by coal mining.

by Rona Rita David

Most desired transition path in Eastern Europe: natural gas

Eight EU countries, mainly from the former communist bloc, have defended the use of natural gas and support for investments in this energy during energy transition.

However, the place of natural gas in EU's energy transition remains controversial. The European Investment Bank has decided to cease, as of 2022, financing for any projects related to fossil fuels, including gas. The EU hasn't regulated yet the draft legislation on green investments. In discussions aimed to establish a classification of investments, depending on their contribution to green transition, the role of gas hasn't been determined. Therefore, this production was not explicitly excluded from the regulation.

Eight European countries advocate for natural gas

Almost a year ago, Bulgaria, Czechia, Greece, Hungary, Lithuania, Poland, Romania, and Slovakia signed together a 2-page text, which they submitted to the European Commission and Council, advocating for the integration of gas and other gaseous fuels (biomethane and carbon-free gas) in the strategy to a carbon-neutral Europe by 2050.

The countries signatory of the document consider that natural gas can be "an important backup and balance source", giving time to the development of renewable energy. "It is essential to maintain the support and financial assistance of the EU for the development of gas infrastructure through a favourable framework, structural funds and investment loans," the signatories claim.

Transition from coal to renewable energy sources through natural gas in Romania

Romania is preparing to mark its permanent elimination of coal. A transformation far from easy, as Romania prides itself with a long and rich mining tradition and continues to use coal, turning it into electricity in its power plants and therefore ensuring its electricity demand. Two electricity production capacities, located in Oltenia and Hunedoara regions, continue to produce coal-fired electricity. While before 1989 the Romanian mining sector employed almost 100,000 people in 450 mines, its current situation is far from encouraging. Indeed, most mines had to be closed, including the oldest mining exploitation, in Petrila, which was opened in 1859. The poor economic performance of coal today is a consequence of several factors, including the lack of investments in operation technologies, costs generated by obsolete technologies, lack of investments necessary to make the production efficient and to comply with environmental standards and, in the end, the lower demand for coal.

On April 21, 2021, Energy Minister Virgil Popescu stated: "Today we completed a memorandum through which we are building a package of social protection for absolutely all those who are working in the mineral resources sector, in the sector related to electricity production: social protection will be directed to those who work underground at Complexul Energetic Hunedoara, to those who work at Mintia Thermal Power Plant and those in Paroseni, if necessary. We are talking about the same social protection for those working at Complexul Energetic Oltenia, where there are surface lignite quarries. The memorandum obviously includes a package of social protection for miners in Crucea mine, which will close because it has no deposits left".

At the same time, Virgil Popescu insisted to reassure that the Ministry of Energy, Nuclearelectrica, and the current management of CNU make extensive efforts so that following the closure of Crucea mine and by opening the uranium mine in Tulghes-Grinties, Romania will continue to have the integrated nuclear circuit ensured.

European Commission Vice-President Frans Timmermans mentions that Bucharest should propose as soon as possible to the European Commission its plan for the permanent elimination of coal.

"This could become an opportunity for creating new jobs, made available to redundant miners. Romania has funds to do it," Timmermans mentioned.

According to Green Peace, the Ministry of Energy has to pursue the following objectives to comply with the European climate targets:

- To stop unsustainable support for coal-fired energy production (too polluting and too expensive) and communicate a clear date and a realistic plan to phase out coal from the national energy mix and replace it with new renewable energy capacities; the first step is the urgent establishment of the coal phase-out committee, a committee which would have a mixed composition and would find solutions for the social and economic impact in the area.
- To correlate these efforts with the financial support program announced by the European Commission, the Just Transition Fund, a program dedicated to mining areas that will undergo an extensive decarbonization program. It aims to maintain the economic production and increase the level of employment for those affected by coal elimination (EUR 2.2 billion will be allocated for Romania).
- To amend the Restructuring and Decarbonization Plan of Complexul Energetic Oltenia, so as to be in line with the principles of granting European funds, to pursue and access the existing opportunities of funding for investments in the development of technologies and infrastructures for clean energy.

In Romania, a sensitive project is Jiu Valley.

Mihai Melczer, expert in the mining industry and former CEO of Complexul Energetic Hunedoara, has recently stated for RRI (Radio Romania International) that: "When you see that coal mining is no longer profitable and exploitation costs are rising, exploitation must be stopped. There is a need for a reorientation towards industries that offer a margin, which allow to reduce operating costs and increase profits. Coal from Jiu Valley is difficult to extract, does not allow the use of advanced technologies. We are not in Poland. Here, coal deposits are more difficult to exploit. And stubbornly pursuing mining activities is just throwing money out the window."

Also, the former CEO of Complexul Energetic Hunedoara highlights the social consequences generated by the plan to restructure mining activities. Among projects that should help the affected industrial regions, we can note the creation, in Petrosani, of an institution that develops training courses, and which should train former miners for jobs in the field of green energy. The project should open to the inhabitants of this mono-industrial region other professional prospects and not only mining careers. Another project, which should provide professional alternatives to the inhabitants of the mining region of Jiu Valley, aims to take advantage of properties of hydrogen, which some see as the energy of the future.

"It is crucial to take coal regions along in the European energy transition – we need a just transition. In practice this means that new jobs need to be created for fossil fuel workers – and they need to be trained to fill these jobs. This is the only way for coal regions to go through a successful transition along with the rest of Europe," WindEurope warns.

The Romanian Wind Energy Association (RWEA) has been working on this issue over the past years and has now been able to fully establish a reskilling project for miners.

It all started with the Renewable Energy School of Skills in Constanta, where 4,500 technicians have been schooled who now take care of O&M of wind farms in Romania and abroad. But starting in July the School's facilities will be expanded to the Jiu Valley – a former coal region. This facility will train 400 miners per year who will be able to work in the wind industry afterwards.

It is highly critical for these regions to be offered help in their transition. Just like many European coal regions, the Jiu Valley used to have a strong economy. But after the closure of all its mines, its communities were left behind and almost half of the region's population has left ever since.

These local initiatives can be a big support in reawakening the local economy. Wind energy has grown a lot in Romania recently. It now provides about 12% of Romania's electricity but is expected to provide up to 35% of Romania's electricity by 2030.

The closing of mines does not have to mean the downfall of these regions. New opportunities will arise, and the wind industry can make its contribution here by creating jobs for locals.

No new coal-fired power plant will be built in Romania

Energy Minister Virgil Daniel Popescu confirms that no new coal-fired power plant will be built in Romania. Romania will receive no less than EUR 4.4bn within the European Just Transition Facility. "Romania is one of the largest gas producers and reserve owners in Europe. We aim that energy transition from coal to renewable energy be made with natural gas."

Despite its efforts to develop renewable sources, Romania depends for energy supply with over 60% on fossil fuels, mainly related to coal extraction. But the rising costs and global heating

force a transition. The challenge appears especially for Jiu Valley, the famous coal basin of the country. This landscape marked by industrial decline raises the question: what will be the fate of mining regions in Europe; how about in Romania?

Bulgaria. Extremely costly transition

Countries in Eastern Europe rely to a great extent on fossil fuels. In Bulgaria, almost half of national energy is produced by coal-fired power plants. A very polluting energy, in terms of CO2 emissions, but also due to the production of sulphur dioxide, a toxic gas that irritates the airways and produces acid rain. Therefore, the country is trying to produce less polluting coal, due to new infrastructure. But this transition is very expensive. Completed in 2011, the new power plant that uses flue gas desulphurization technology cost EUR 1.3 billion. "Our efficiency coefficient for these emissions sometimes reaches from 98% to 99%. So, you can imagine the quantity of sulphur dioxide we capture in our plant. Captured sulphur dioxide reacts with limestone and forms industrial gypsum," said Ivan Tzankov, CEO of AES Bulgaria.

Following Bulgaria's accession to the EU in 2007, sulphur dioxide emissions have been significantly reduced, from 800,000 tons per year to less than 100,000 tons today. But this remains insufficient in the eyes of the European Commission, which referred Bulgaria to the EU Court of Justice in 2019.

According to several experts, Bulgaria will not be able to comply with new

European rules on pollution, due to its aging coal plants. Some of the most recent plants are less than 20 years old. The others are power plants of 50, 60, 70 years, which are reaching the end of their life. In 2018, prices increased from EUR 5 to EUR 25 per ton of coal, as old coal-fired power plants had to comply with EU system of emission quotas. An example is the public power plant Martiza Iztok 2, for which the situation is particularly difficult, as it has accumulated hundreds of millions of euros in debts and produces expensive electricity, which is difficult to sell. The power plant is even more important as it generates up to half of the entire electricity in Bulgaria during the cold season. This is why its closure or upgrade is such a sensitive topic in the country. According to trade unions, over 100,000 people depend economically on this power plant. The Ministry of Energy is trying to expand its life at least until 2050.

Poland – 'coal country', a nice history chapter that must be closed

In September last year, under pressure from the European Union, Warsaw decided to begin energy transition. The first measure: closing all coal mines by 2049. A decision with serious consequences, as electricity production relies 80% on this fuel. Artur Sobon, minister responsible for state assets, acknowledges that there is no future for coal in Poland. "We have to do deeper and deeper extractions; it is hard work that will be done less and less. It is a nice chapter in Poland's history, which must be closed," said the minister in February this year.

To reduce coal share in electricity production from 80% to 32% by 2040, the Government wants to build, by then, six reactors, of which the first in 2026. Also, Poland undertakes to develop renewable energy, especially solar power, and offshore wind power, in the Baltic Sea. The Minister detailed the problems of heat production,

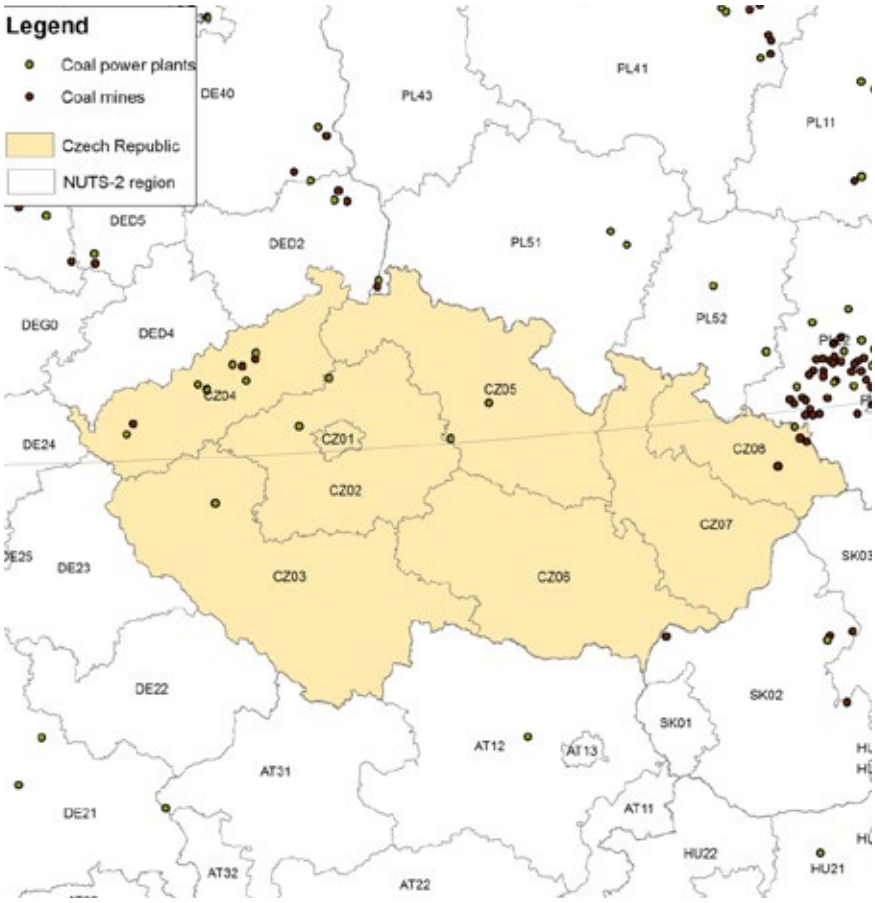
especially to decarbonize the chemical industry. The country is interested in the technology of high-temperature gas reactors (HTGR). Discussions continue with the Japanese Atomic Agency (JAEA) on this technology and the 30 MW high temperature test reactor (HTTR) also received the green light from the Japanese Safety Authority (NRA) to bring the reactor in line with the new safety standards in order to restart it. Poland wants to make sure that the model of financing these reactors will ensure competitiveness of nuclear power.

Czechia: Construction of new reactors in Temelin and Dukovany

While for several years Czechia has expressed its desire to focus more on nuclear power, today, with the strong support of the state, Czechia is turning to the national energy company CEZ.

In 2015, Czechia adopted a strategic plan for 2040-2050, in line both with the national objective of keeping energy security and the European decarbonization objective. This plan provided for the construction of an additional reactor, on each of the two sites, Temelin and Dukovany, with the goal of reaching 50% of nuclear power production by 2050, instead of 35% at the moment. The new nuclear construction project was confirmed by government resolution on July 8, 2019 and it was decided to begin work at Dukovany site. Czechia currently has two nuclear power plants: Temelin and Dukovany.

In May 2020, Czech state officials and players in the nuclear sector, including CEZ, agreed on a financial plan articulated around a state loan for the renewal



of Dukovany nuclear power plant, including the estimated cost of the following reactor: EUR 5.80 billion. This orientation takes shape to help lower electricity bills. Waiting for the approval requested from the European Commission on the main conditions of this project, the Czech state has held for long-time discussions with CEZ (the majority shareholder, 70%) about the project's options to renew its nuclear park, to anticipate the shutdown of its first reactors in the following decades. The country's priority is to guarantee its energy independence and its related status of net electricity exporter. Moreover, it's about a drastic decrease in the share of fossil fuels, starting with coal, which accounts for 50% of the electricity mix.

At European level, Czechia defends the objective of nuclear power, considered a source with reduced carbon emissions, in accordance with the European Union rules. According to Karel Havlicek, Minister of Industry and Commerce, it would also contribute to the reduction of its financing costs.

Hungary. Coal phase-out by 2025

"The last coal-fired power plant of the country will be closed in 2025, not in 2030," said Hungary's Secretary of State for European Affairs, Attila Steiner, at the annual summit 'Powering Past Coal Alliance (PPCA)', on March 2, 2021.

"We want to achieve 90% carbon neutral electricity production by 2030, and to do this, Budapest intends to maintain existing nuclear power production and increase photovoltaic production to 6 GW - three times more than the existing nuclear capacity of the country," said Attila Steiner.

The Secretary of State added that he wanted the closure of the last major lignite-fired thermal power plant of the country, in Mátra, by 2025, as through this closure Hungary would benefit from European funding to support the affected works in the coal industry.

Greece 2.0. Energy transition in Greece, lagging behind other European countries

The European Investment Bank (EIB) agreed to help manage up to EUR 5 billion as part of implementation in Greece of the National Recovery and Resilience Plan, known as 'Greece 2.0'. Technical, financial, and environmental experts of EIB will identify high-impact projects, priority sectors and efficient financial structures to ensure the best use of the new European support and loan subsidies for Greece to mitigate the social and economic impact of the coronavirus pandemic. It seems that Greece has breached the European Commission rules on electricity market liberalization. Some still request a fair and real competition by breaking the monopoly of Public Power Corporation S.A. (PPC); therefore, the Greek energy transition is lagging behind other European countries. And as in Europe discussions focus on gradual elimination of coal and lignite, while ensuring a smooth transition for regions that have depended for years on coal extraction and electricity production, in Greece lenders have put pressure to sell 40% of PPC lignite stations to 'upgrade' the electricity market, as part of the rescue agreement.

For WWF Greece, the decision to sell a large part of coal assets could be a disaster for consumers and the sustainability of the energy model of the country. A study on Greece's long-term energy plan, published by the National Observatory in Athens and WWF Greece, showed that electricity costs would be significantly higher if the country's dependence on lignite were extended. "While the rest of Europe is focused on decarbonization,

the claim by Athens officials that the Greek market will become competitive by selling one or two PPC lignite plants is simply a lie," said in 2019 Nick Keramidas, European director for metallurgy and industrial businesses.

The new European industrial strategy proposes the creation of new alliances

Weaknesses in EU capacities of extraction, processing, recycling, refining and separation (e.g., for lithium) reflect a lack of resilience and a high dependence on sources of supply in other parts of the world. Some materials extracted in Europe (such as lithium) must currently leave the continent to be processed elsewhere. The technologies, capacities and abilities of refining and metallurgy are a key link in the value chain. Thanks to the European Battery Alliance, public and private funds have been widely mobilized and should, for example, make it possible to meet 80% of European demand for lithium from European sources by 2025.

The European Commission has presented its action plan on critical raw materials defined as "raw materials that are the most important from an economic point of view and that present a high risk of lack of supply." For example, 75 to 100% of metals extracted in Europe come from third countries. In order to overcome this excessive dependence and materialize its green deal, the European Commission is implementing a strategy to secure supplies to the EU.

The Commission Communication to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions is structured in two directions. It first provides the list of critical raw materials for the EU and sets out the measures to be taken to strengthen the Union's resilience and strategic autonomy. The Commission reviews the list every three years, the first being published in 2011 and containing only 11 substances compared to 30 in 2020. Bauxite, lithium, titanium, and strontium appear for the first time in the new list. Helium and nickel are not listed but remain under surveillance due to growing demand.

This list is used to support the development of EU policies, to play a role in negotiating international agreements and to identify investment needs for different programs (Horizon 2020, Horizon Europe).

The criticality assessment method could be revised for the next list (2023) to incorporate the latest knowledge. The EU will contribute to global efforts for better resource management and cooperate with relevant international organizations. This knowledge base should enable strategic planning and forecasting, reflecting the EU's goal of creating a climate-neutral digital economy by 2050 and strengthening its influence on the world stage. The geopolitical aspect should also be an integral part of this forecasting exercise, thus enabling Europe to anticipate and meet its future needs.

The EU Action Plan for critical raw materials will pursue objectives such as:

• Establishing resilient value chains for industrial ecosystems in the European Union;

- Reducing dependence on primary and critical raw materials through a circular use of resources and the design of sustainable and innovation products;
- Strengthening supply and sustainable and responsible processing of raw materials in the EU;
- Diversification of supply sources through sustainable supply to third countries, by consolidating open and regulated trade in raw materials and eliminating international trade distortions.

Romania, Europe's Economic Growth Champion in Q1 2021

According to provisional data reported by Eurostat, Romania is the champion in the European Union, having the highest economic growth in Q1 2021, followed by Cyprus with an increase of 2%, Hungary of 1.9% and Lithuania of1.8%.

Compared to the same quarter of last year, the Romanian GDP has exactly the same value, which means that the Romanian economy has fully recovered after the COVID19 pandemic and now we are registering a relaunch.

After this advance, analysts believe that there are great chances for the Romanian economy to end the year with an GDP growth of even 7%. The government had initially estimated an increase of 4.3% for the whole year, recently changed to 5%, a target that will certainly change if it is a good agricultural year as shown, but also an increase beyond industry expectations.

The European Commission indicated in the spring forecast an advance of the Romanian economy of 5.1% this year, while the IMF revised its estimates to 6%.

In 2022, the IMF expects Romania's economy to grow by 4.8%, the Fund said in the April edition of its World Economic Outlook (WEO) report.

The IMF also said it expects the GDP of Emerging and Developing Europe area comprising Romania, Russia, Turkey, Poland, Ukraine, Hungary, Belarus, Bulgaria, Serbia, and Croatia to grow by 4.4% in 2021 and by 3,9% in 2022.

After a milder-than-anticipated decline in 2020, Romania's economy is set to recover from the COVID19 crisis and return to pre-crisis levels of economic activity before the end of 2021. Nevertheless, uncertainty remains high given the unpredictable evolution of the pandemic and possible disruptions in the supply of vaccines. The budget deficit is projected to decline gradually on account of incipient fiscal consolidation efforts and strong GDP growth.

Strong recovery ahead

According to Eurostat, real GDP is forecast to increase by 5.1 % in 2021 and 4.9% in 2022. Private consumption is expected to recover as the vaccination roll-out progresses and social distancing measures are gradually lifted.

The phasing in of projects under the RRP is set to lend new impetus to investment growth. After a sharp contraction in 2020, exports are expected to rebound in 2021, supported by the gradual recovery of global trade, while higher consumer spending should spur import growth. Overall, the contribution of net exports to growth over the forecast horizon is set to remain negative. The current account deficit is expected to decline slightly to 4.9% in 2021 and 4.6% in 2022.

Policy measures to limit job losses adopted in 2020 helped contain the rise in the unemployment rate to only 5% from 3.9% in 2019.

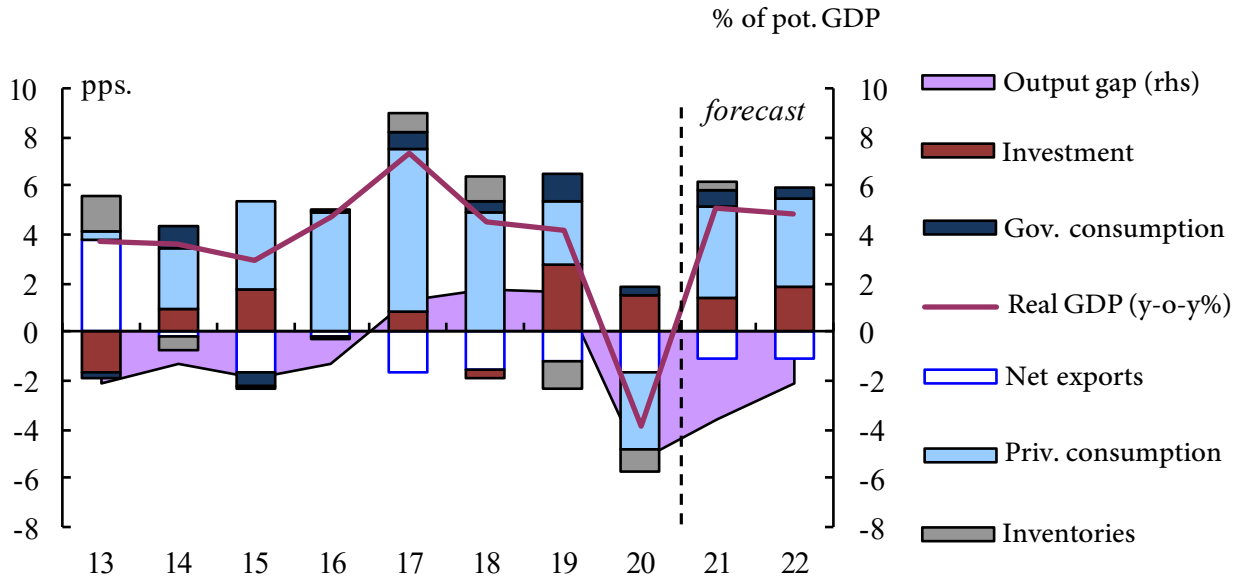
Unemployment is projected to reach 5.2% in 2021 as headcount employment looks likely to be almost stagnant and because of growth in the labour force.

In 2022, the unemployment rate is expected to decline on the back of a rise in employment.

Nominal wages growth is projected to be relatively steady over the forecast horizon, but clearly lower than the double-digit rates seen in recent years.

HICP inflation declined from 3.9% in 2019 to 2.3% in 2020, largely on account of the sharp drop in oil prices but also due to falling food and services prices. Inflation is projected to increase to 2.9% in 2021, mainly as a result

Romania - Real GDP growth and contributions, output gap



Figures are based on the Commission services' calculations using the latest published available data.

of the recovery in oil prices and the rise in electricity tariffs following market liberalisation. It is subsequently expected to decline to 2.7% in 2022.

Risks to the growth forecast

Risks to the growth forecast are broadly balanced.

On the one hand, confidence effects and a better-than-expected progress of projects financed under the RRP could provide an extra boost to domestic demand. However, delays in the implementation of the RRP could result in a more muted recovery.

The forecast follows the authorities' backloaded projection on the plan's implementation, according to which only a limited amount of the grant allocation will be used in 2021 and 2022.

Public deficit on a downward trend

The general government deficit was 9.2% of GDP in 2020, almost 5 pps. of GDP higher than in the previous year. This increase was mainly the result of pre-existing expansionary policies, including double-digit increases in pensions, as well as of the impact of temporary measures against the COVID19 pandemic and the overall deterioration in the macroeconomic environment. However, the government avoided an even larger increase in the deficit and in its debt by reversing earlier decisions to increase pensions by 40% and to double the child allowance.

The deficit is forecast to fall to around 8% of GDP in 2021. This improvement is mainly due to a suspension of new increases in pensions and public wages, additional cuts to some bonuses and other expenditure, and the partial withdrawal of emergency measures. Moreover, the fiscal position is forecast to benefit from higher revenues thanks to the recovery of the economy.

As the economic recovery continues in 2022, and crisis-related measures are discontinued the budget deficit is expected to fall further, to 7.1% of GDP.

Moreover, the suspension of increases in public wages is set to continue, while pensions are expected to increase following a standard indexation rule, instead of the faster pace that had previously been planned.

General government debt increased substantially in 2020, to 47.3% of GDP. In 2021, public debt is forecast to increase at 49.7% of GDP and continue increasing in 2022, mainly due to the still high primary deficit.

The fiscal forecast is subject to upside risks as the Romanian government put forward a medium-term fiscal policy plan to reduce its deficit to less than 3% of GDP by 2024, which should be accompanied by deficit-reducing measures as of 2022. ■

Renewable Energy Market: Outlook for 2021 and 2022

Renewables were the only energy source for which demand increased in 2020 despite the pandemic, while consumption of all other fuels declined. Will renewable energy source uptake therefore expand more quickly as the global economy recovers from the crisis? In exploring recent market and policy developments, the Renewable Energy Market Update by IEA forecasts new global renewable power capacity additions for 2021 and 2022. It also provides updated biofuel production forecasts for these years, as the sector suffered significant losses with declining transport demand during the pandemic.

Highlights

- In 2020, annual renewable capacity additions increased 45% to almost 280 GW – the highest year-on year increase since 1999.
- Exceptionally high-capacity additions become the "new normal" in 2021 and 2022, with renewables accounting for 90% of new power capacity expansion globally.
- Solar PV development will continue to break records, with annual additions reaching 162 GW by 2022 – almost 50% higher than the pre-pandemic level of 2019.
- Global wind capacity additions increased more than 90% in 2020 to reach 114 GW. While the pace of annual market growth slows in 2021 and 2022, it is still 50% higher than the 2017-2019 average.
- Annual growth in China's renewables market will decelerate following the exceptional expansion that resulted from developers rushing to complete projects before subsidy phase-outs. However, the rest of the world compensates for China's slowdown and maintains the pace of renewables expansion.
- Europe's capacity growth accelerates thanks to further policy support and a booming corporate PPA market as PV costs continue to decline.
- The updated forecast for the United States is more optimistic because of federal tax credit extensions. New US emissions reduction targets and the infrastructure bill, if passed, will boost renewables expansion after 2022 (beyond the timeframe of this forecast update).
- Although India's capacity additions in 2020 declined almost over 50% from 2019, the country is expected to set new records for renewables expansion in 2021 and 2022 as delayed projects from previous competitive auctions are commissioned.

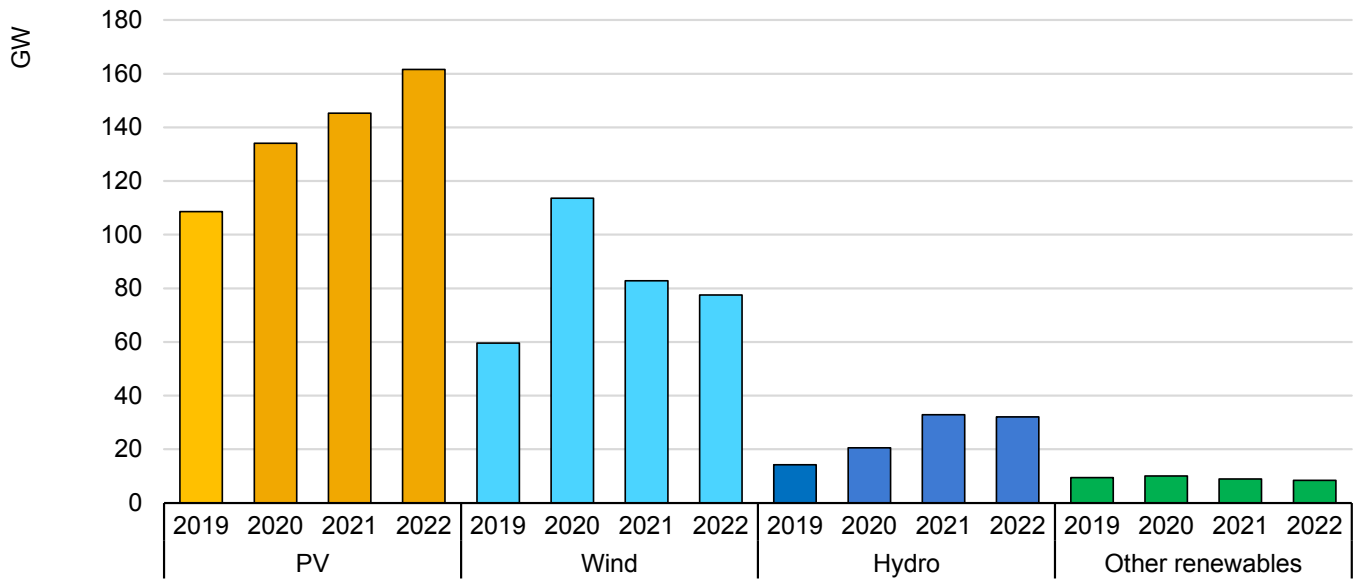
However, the current (April 2021) surge in Covid-19 cases has created short-term forecast uncertainty for this year.

- Transport biofuel production is expected to rebound to 2019 volumes in 2021, after having fallen 8% in 2020. Production is also forecast to expand another 7% in 2022.
- Mainly driven by clean fuel standards and policy support in the US, global Hydrotreated Vegetal Oil (HVO) production capacity is expected to nearly double in the next two years, significantly expanding the capability of producing biofuels from waste and residue feedstocks.

A quick look back at 2020

Despite pandemic-induced supply chain challenges and construction delays, renewable capacity additions

Net renewable capacity additions by technology, 2020-2022



in 2020 expanded by more than 45% from 2019 and broke another record. An exceptional 90% rise in global wind capacity additions led the expansion. Also underpinning this record growth was the 23% expansion of new solar PV installations to almost 135 GW in 2020.

Policy deadlines in China, the United States and Viet Nam spurred an unprecedented boom in renewable capacity additions in 2020. China alone was responsible for over 80% of the increase in annual installations from 2019 to 2020, as onshore wind and solar PV projects contracted under China's former FIT scheme, and those awarded in previous central or provincial competitive auctions, had to be connected to the grid by the end of 2020. In the United States, wind power developers rushed to complete their projects before expiration of the production tax credit (PTC), although it was extended for another year, in December 2020. In Viet Nam, phaseout of the FIT for solar PV projects led to an unprecedented rush in commercial and residential installations.

The rush to commission projects prior to policy deadlines in these countries took place in the last quarter (Q4) of 2020, especially in December. In fact, developers connected almost 150 GW of new renewable capacity in Q4 of 2020 – more than double the number of gigawatts commissioned in Q4 of 2019 and exceeding the amount installed in the first three-quarters of 2020. Overall, IEA quarterly deployment estimates indicate that the slowdown in renewable capacity additions was limited to Q1 2020 only, mainly in China, while construction activity continued strongly in the rest of the world despite continuous movement restrictions and supply chain delays. The December surge in new installations also indicates that solar and wind construction supply chains were able to furnish record numbers of projects in China, the United States, Viet Nam and various European countries.

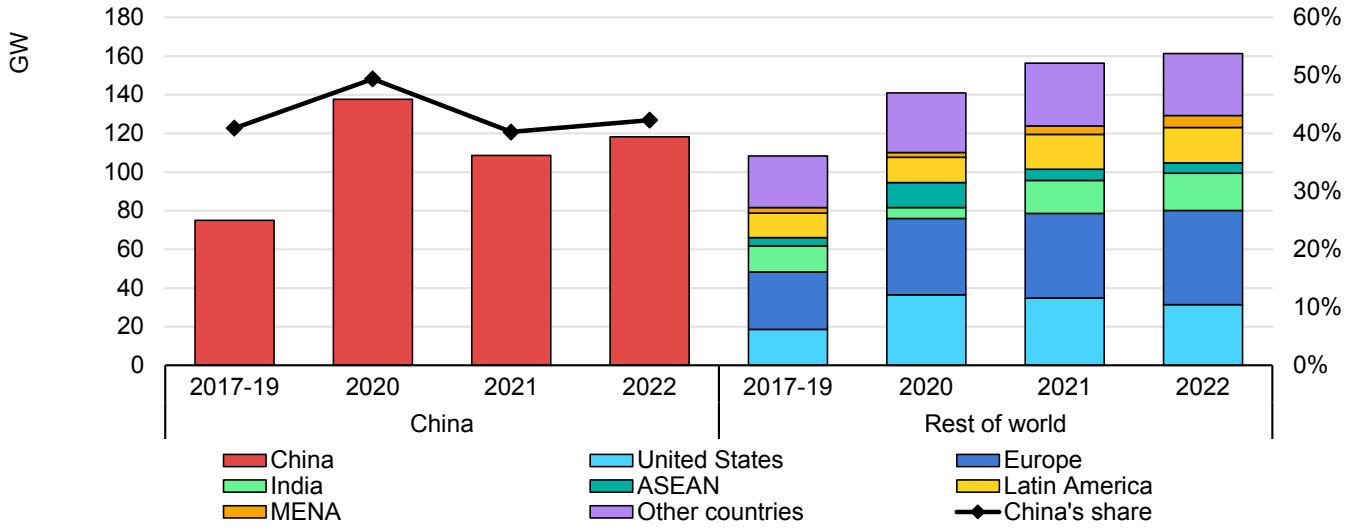
2021 and 2022 forecast summary

Renewables' deployment geared up in 2020, establishing a "new normal" for capacity additions in 2021 and 2022. The exceptional level of renewable energy capacity additions is expected to be maintained, with 270 GW becoming operational in 2021 and 280 GW in 2022. This expansion exceeds the record-level annual capacity additions of 2017-2019 by over 50%, such that renewables are expected to account for 90% of total global power capacity increases in both 2021 and 2022.

Although the amount of annual wind capacity additions is expected to decrease in 2021-2022 after the exceptional jump last year in China, 80 GW of annual installations are still anticipated globally, i.e., almost 35% more than in 2019.

Continuous growth in solar PV additions, spurred by lower investment costs and ongoing policy support, partly compensates for lower wind capacity additions. IEA expects annual solar PV expansion to reach 145 GW in 2021 and 162 GW in 2022, breaking records and accounting for almost over 55% of all renewable energy expansion this year and next. The acceleration of hydropower additions through 2022 is driven by the commissioning of mega-scale projects in China. Meanwhile, expansion

Annual renewable capacity additions by country and region, 2017-2022



Notes: The "2017-19" bar represents average annual capacity additions for that three-year period. ASEAN = Association of Southeast Asian Nations. MENA = Middle East and North Africa.

in other renewables, led by bioenergy, remains stable and represents 3% of total new renewable capacity additions.

China's policy transition slowing expansion

Although China has accounted for 40% of global renewable capacity growth for several years already, for the first time in 2020 it was responsible for 50% – a record level resulting from the unprecedented peak in new installations in December. IEA expects China's renewable capacity additions to decline by one quarter in 2021 compared with last year because of the government's decision to phase out subsidies for both wind and solar PV projects at the end of 2020. There is also uncertainty about the structure of the new incentive schemes that will be announced towards the end of 2021.

Nevertheless, China's anticipated annual renewable capacity additions (+45% in 2021 and +58% in 2022) remain significantly above the 2017-2019 average despite this slowdown. Growth may accelerate again after 2022 only, stimulated by new policy measures aligned with the country's ambitious long-term target to attain net-zero emissions by 2060.

Europe, second largest renewable power market after China

In Europe, annual capacity additions are forecast to increase 11% to 44 GW in 2021 and 49 GW in 2022. With this expansion, this year the region will break the record for annual additions for the first time since 2011 and become the second largest market after China. Germany will continue to deliver the largest renewable capacity additions in Europe, followed by France, the Netherlands, Spain, the United Kingdom and Turkey. This strong growth results from multiple countries extending their policies to meet the EU 2030 climate target, and by corporate power purchase agreement (PPA) markets booming in several countries.

- Germany – support for solar PV, wind, and bioenergy with higher auction volumes through Germany's Renewable Energy Act 2021 (EEG)
- The Netherlands – allocation of the new SDE++ scheme in December 2020
- Turkey – extension of feed-in tariff (FIT) scheme for all renewables
- Poland – new auction awarded almost 1 GW of PV in December 2020
- Spain – record corporate PPA agreements signed in 2020
- Sweden – low wind generation costs stimulate a boom in the corporate PPA market; continuation of the PV rebate programme
- The United Kingdom – proposal to re-include onshore wind and solar PV in the 2021 contracts for difference auction.

Read the magazine everywere.

You will always find a good story!

ENERGY
INDUSTRY REVIEW

Schlumberger and NOV to Accelerate Adoption of Automated Drilling Solutions

Schlumberger and NOV started a collaboration to accelerate automated drilling solutions adoption by oil and gas operators and drilling contractors. The agreement will enable customers to combine Schlumberger surface and downhole drilling automation solutions with NOV's rig automation platform to deliver superior well construction performance. This integrated offering enables the automation of manual workflows, improving safety, decision making, consistency, and efficiency in drilling operations.

"We are pleased to collaborate with NOV and to integrate their rig automation interface with our drilling automation solutions to unlock higher performance for operators and drilling contractors. Leveraging downhole and surface automation applications, we can deliver enhancements in operations safety and efficiency, and deliver top-quartile wells for our customers consistently," comments Olivier Le Peuch, CEO, Schlumberger. "This partnership will help accelerate customers' adoption of drilling automation technologies, enabling superior well construction performance."

"Through this collaboration, NOV demonstrates its commitment to deliver an open digital automation platform that enables drilling contractors to achieve higher consistency, safety, and efficiency with improved wellbore quality," said Clay Williams, Chairman, President and CEO, NOV. "We continue to invest in digital solutions that provide value for our customers. Drilling automation allows rig crews to focus on the big picture to drive performance and less on manual, repetitive tasks."

The combined solution leverages advanced AI from the Schlumberger DrillOps on-target well delivery solution, while NOV's NOVOS process-automation platform controls all NOV rig equipment within the operational envelope. The two technologies will work seamlessly together to manage compliance to procedure and to reach best-in-class operational performance.

The family of DrillOps solutions includes open and modular technologies that leverage Schlumberger's deep drilling domain knowledge and advanced machine learning applications to execute the digital drilling plan consistently and to automate drilling tasks, attaining higher levels of efficiency.

On-target well delivery solution

The DrillOps on-target well delivery solution is the execution component of Schlumberger fully integrated digital well-constructing planning and operations solution. It ensures rigs operate at peak performance while implementing the digital drilling plan and builds new levels of instrumentation, automation, and cognition directly into existing drilling operations. With the DrillOps solution, operators accomplish consistency through

autonomous drilling while securing progress toward their own business goals for drilling efficiency and more productive wells.

The DrillOps solution adopts a goal-based automation methodology, using powerful data analysis and learning systems to assist and optimize every task, from setting ROP to drilling a stand. Users choose from a preset menu of automatable drilling tasks, and using data analysis and models, share a plan to achieve the specified goal, taking any measurements required to calibrate itself. Operators have the flexibility to modify and replan activities dynamically, based on a live appraisal of equipment, personnel, and supplies.

Automation enables reduced staffing levels on mechanised rigs and delivers unparalleled consistency of repetitive tasks, helping you reach your technical limit on every well.

Alert and escalate procedures are built directly into the DrillOps solution—making it easier to resolve any potential conflicts and administer corrective action. Everything that happens is automatically documented within the digital well file to streamline reporting and drive continuous improvement.

The DrillOps solution monitors and captures a broad range of operational data to support operators during drilling with real-time advice and coaching to improve decision-making and reduce risk. Intelligent advisory systems guide crews to stay within operating windows and safety thresholds. Predictive analytics continuously identify drilling dysfunctions, alerting personnel before pre-defined limits are due to be exceeded to reduce Non-Productive Time (NPT).

Progress is continually compared with targets

defined in the drilling plan across a range of criteria, including operating costs and other KPIs, to deliver a live picture of performance. Any deviations from the plan are recorded in the digital well file, alongside all of the relevant operational data. By capturing the full operational context across multiple domains, the DrillOps solution increases the value of reporting and post-job analysis to improve every subsequent well.

The DrillOps solution executes the digital drilling plan and ensures plan adherence. It improves collaboration and coordination by directing the relevant information to the right people, at the right time, and always in the right context. Since workflows are curated centrally by the system, step-by-step activity plans are automatically generated for individual operations teams to keep all teams aligned (town and rig). With all well construction activities from tripping to cementing continually monitored and dynamically updated with the latest operational activity, your operations team is always up to date.

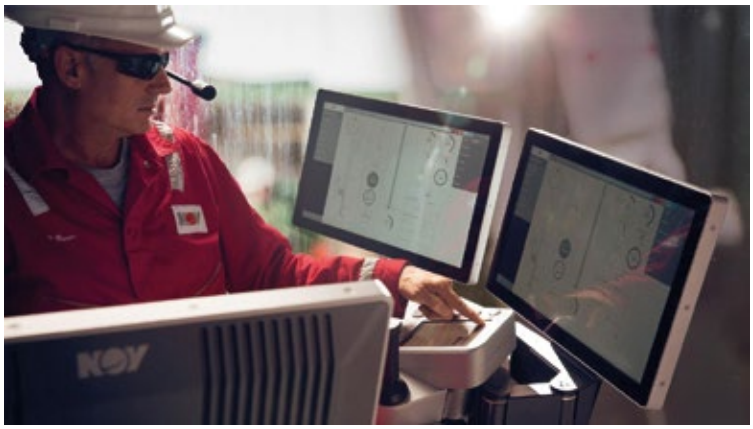
Make the most of every minute downhole, by utilizing relevant downhole tool data and surface measurements, combined to make the best use of the information available. Step-by-step simplified workflows, reduction of human dependencies, and transformation of how directional and data services are delivered, enabling a consistent approach, which allows your experts to be closer to you anytime and anywhere.

The DrillOps solution is a part of the DELFI environment, built upon a secure data platform that is accessible and open to everybody. Your solutions can be customized to your rig capability, from standard and instrumented rigs to fully mechanized and connected rigs. Edge and cloud devices seamlessly interact to ensure complete integrity of your operations with office support.

NOVOS Reflexive Drilling System

NOVOS is the industry's only reflexive drilling system, automating repetitive drilling activities, benefiting contractors by allowing drillers to focus on consistent process execution and safety, and benefiting operators by optimizing drilling programs.

A reflexive drilling system is designed to perform a series of actions when prompted, just as human reflex responds when acted upon by a specific stimulus. The NOVOS reflexive drilling system is easily scalable and can augment existing people and processes for greater control, consistency, and enhanced performance, or expand all the way to full closed-loop automation.



NOVOS Advantages

NOVOS provides control and consistency for any operation. It allows drillers to automate repetitive drilling activities, such as making a connection (offshore), coming off and on bottom, with specific parameters for circulation, weight-on-bit and more. The result is greater consistency, with every driller – regardless of individual experience level – able to achieve the same improved performance time and time again.

Precise Control

Set the exact parameters to meet the needs of your drilling program, from circulation to weight-on-bit and everything in between, and the NOVOS system performs at the push of a button.

Unmatched Consistency

Regardless of who's at the controls, the NOVOS system offers the same performance, again and again, eliminating NPT and protecting your equipment.

Increased Performance

With more consistency comes greater performance. Because the reflexive system automates repetitive tasks, you'll achieve better average performance throughout the entire drilling lifecycle, regardless of the experience level of the driller.

Infinite Customization

With additional off-the-shelf apps that can be tailored to your needs or completely custom designs, the NOVOS system can be updated to meet specific needs with just a bit of software.

Minimal Interruption

The whole system can be installed in 12 hours and requires limited additional hardware. ■

Next-generation Battery Safety Technology for European Space Agency

Xerotech, a leading manufacturer of advanced lithium-ion battery systems, announced that it will qualify one of its core proprietary battery safety tec

"This is a very exciting project with ESA under the Building Blocks General Support Technology Program (GSTP), that will enable Xerotech to stay at the forefront of battery pack design. Demonstrating that our proprietary PPR solution exceeds the extremely stringent requirements for space applications will provide tremendous technical validation of a core pillar of Xerotech's battery safety concept which has already been proven in ground-based applications," Barry Flannery, CEO and Founder of Xerotech, said.

"Xerotech already utilizes its proprietary PPR technology in the Hibernium™ product line for Off-Highway Vehicles and Non-Road Mobile-Machinery, that was launched in Q4 2020" he added.

"We have experienced an excellent market reception of our recently launched Hibernium™ platform, partially thanks to the market leading safety-first design. This project with ESA further strengthens our position as leaders in module and pack technology, not only for heavy duty vehicles, but for battery packs in general," Thomas Tomaszewski, VP of Business Development at Xerotech, pointed out.

The technology, known as passive propagation resistant (PPR) design, is a critical safety requirement of future space missions including manned spaceflight. Xerotech's PPR technology is capable of preventing single and multi-cell thermal runaway within a battery pack by utilizing an ultra-lightweight fire-retardant structural foam which is 90% lighter than competing PPR technologies. The technology can be applied to all current space battery designs and has the potential to enable previously impossible mission profiles and applications.

About Hibernium™

Xerotech's Hibernium™ platform is the market first battery system platform developed for low-volume high-diversity customers. Utilizing its patented safety and thermal management technology Xerotherm™, Xerotech enables electrification of "everything else" that uses internal combustion engine today.

The battery system is the core of Xerotech's new electric vehicle and powers everything. It consists of battery modules, battery management system, battery disconnect unit and overall pack housing. Its battery platform, Hibernium™ is built on a modular platform, allowing for high flexibility and economies of scale. All of their packs are built with: Battery cells; Scalable modules; Xerotherm™ liquid thermal management; Passive Propagation Resistant technology; Battery Management System. ■

Hydrite® and AMA XpertEye to Launch RITE-Sight™ to Support Customers and Field Service Personnel

Hydrite®, an integrated manufacturer and supplier of chemicals and related services, is launching a new AR (assisted-reality) program, RITE-Sight™, to support customers and field service personnel, which leverages XpertEye, a solution developed by AMA.

RITE-Sight™ is a web-based remote collaboration solution, providing on-demand access to technical experts to improve troubleshooting and maintenance practices, in a safer and more efficient manner. This AR (Assisted Reality) conferencing solution is hardware agnostic, designed for wearable devices, and able to connect to multiple video sources (like a thermal camera or a microscope). RITE-Sight™ allows field technicians to share crucial information to and from the field, reducing downtime, travels, and costs. All data is transmitted using a secure connection with end-to-end encryption, and XpertEye's 'Confidential Mode' allows Hydrite to ensure that no sensitive customer data is put at risk during remote assistance calls.

"We are excited to add this program to our solutions portfolio. Our alliance with AMA provides us the technology to reach our customers and offer remote assistance, equipment setup and maintenance, and emergency support," said Jamison Vanden Einde, Director of Commercial Technology for Hydrite.

"RITE-Sight aligns with the RITE-Team philosophy. With this technology, we can support our customers and lend our expertise in real-time. It is innovative technology we will use in various functions across our many industry segments," Mitch Fay, Technical Director for Hydrite, commented.

"Hydrite is a great example of a company who has taken obstacles of the past year and turned them into an advantage through technology," says Joe O'Connor, Account Executive at AMA. "By leveraging this solution, Hydrite will now offer industry leading support to their customers, all while reducing their traditional overhead costs and ecological footprint."

As a company with a strong commitment to quality and service, Hydrite continues to invest in people, technology, research, quality control, and training to offer products and systems that help to ensure food safety and enhance the quality of food supply through creative solutions. ■

Our mission is to promote the role and the importance of the entrepreneur for economic and social development.

We support entrepreneurs looking to generate evolution and an innovative approach to local business culture.

office@adaaromania.ro
www.adaaromania.ro

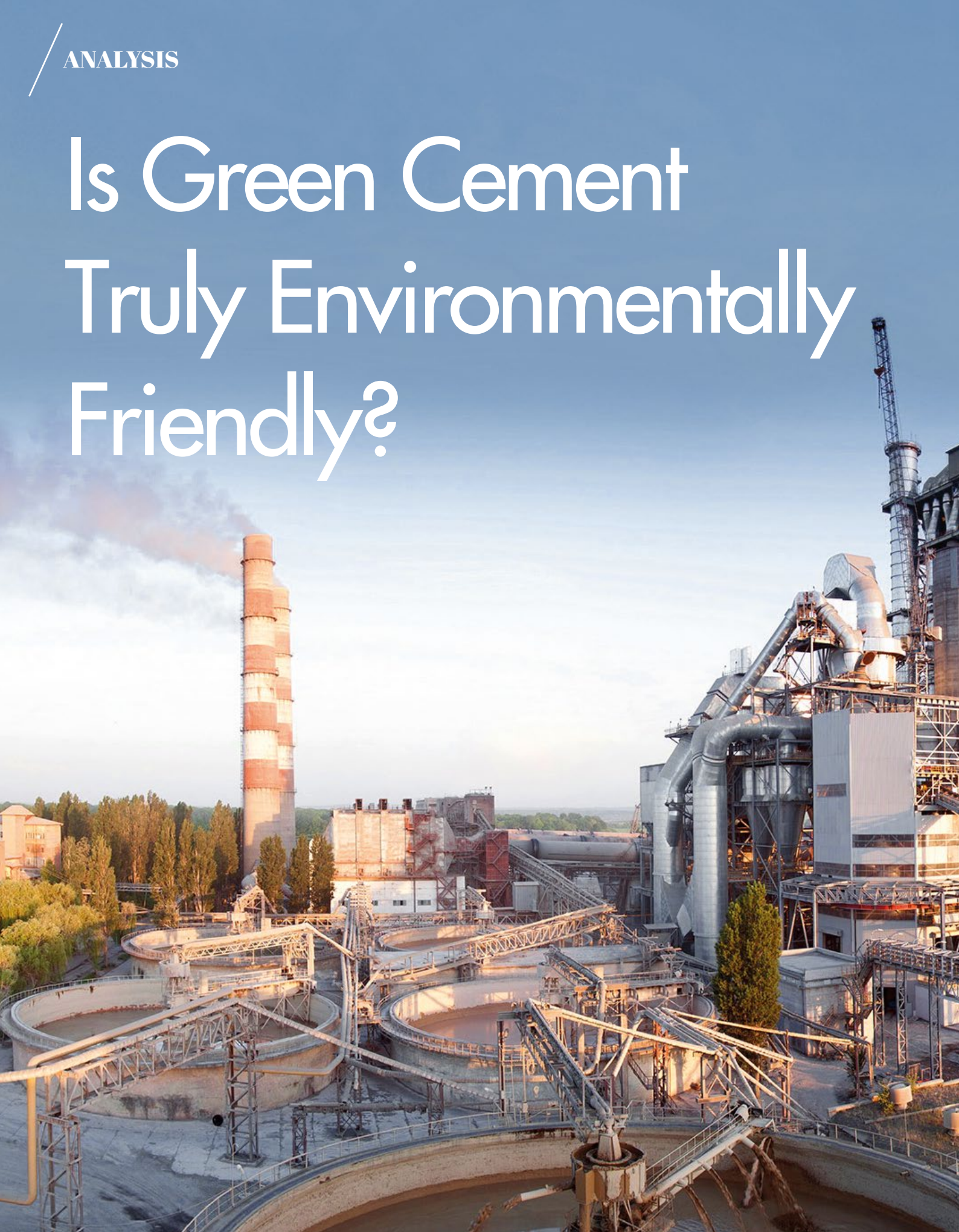
ADAA

THE ASSOCIATION FOR THE DEVELOPMENT OF LOCAL ENTREPRENEURSHIP

Credibility Responsibility Excellence

THINK BIG, ACT HUGE

Is Green Cement Truly Environmentally Friendly?



Every year, over 4 million tons of cement are produced, accounting for approximately 8% of global CO2 emissions. Cement production is a difficult and complex industry, which involves transformation in powerful furnaces of limestone and clay. The resulting heat releases large quantities of carbon dioxide. Transport and extraction of these raw materials are also sources of CO2 emissions into the atmosphere.

by **Rona Rita David**

Although the National Recovery and Resilience Plan (NRRP) can play a major role in reducing the carbon footprint, quite many obstacles are in the way of deep decarbonization of cement. The sector is dominated by a handful of important manufacturers, which are cautious in terms of creating new products that would calls into question the already existing ones. Alternative materials are not always easy to procure. In the meantime, architects, engineers, entrepreneurs, and customers are prudent regarding the new building materials. Therefore, implementation of new practices is a factor that cannot be neglected for millions of workers involved in the use of concrete in the urban landscape.

DECARBONATED CEMENT - PROJECTS AND INITIATIVES OF SOME EUROPEAN COUNTRIES

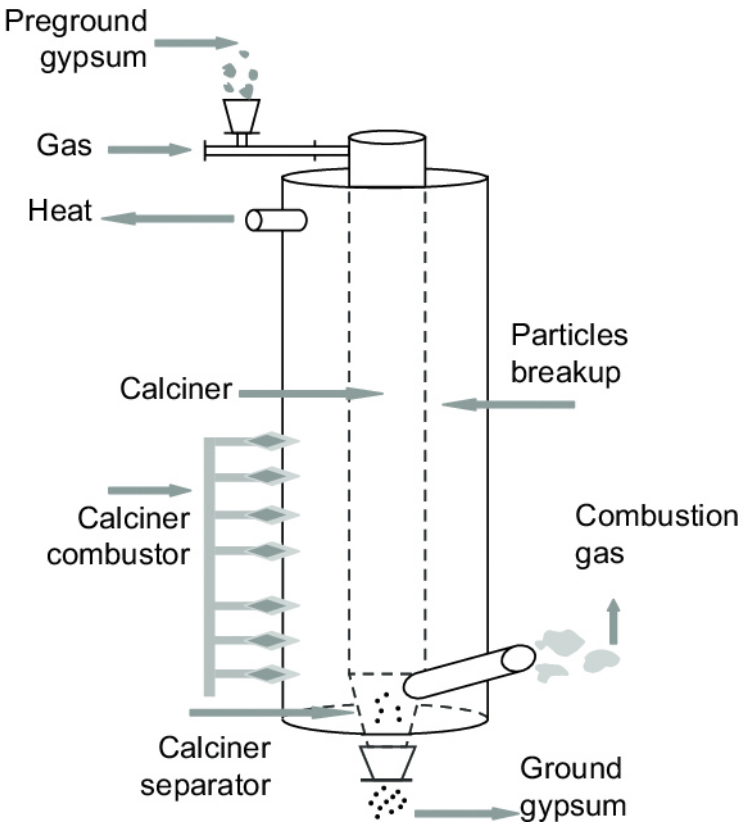
Belgium. LEILAC project

The Belgian construction market absorbs approximately 6.5 million tons of cement, of which approximately 75% is domestically produced cement. National consumption amounts to over 576 kg of cement per capita (figure from 2020), which places it in the leading position compared to the neighbouring countries. The three large cement groups that carry out their activity in Belgium (Holcim, CCB Ciment, Eloy Beton) are based in Tournai, Mons, and Liège, where limestone-rich deposits ensure the necessary raw materials for the manufacturing of clinker. The current trend in the industry is to focus on the formation of increasingly large units, which is necessary to optimize productivity and efficiency of the necessary environmental protection investments.

To find a more environmentally friendly solution, the CBR Lixhe factory has put into practice a pilot project (LEILAC), which consists of a new carbon capture technology.

LEILAC project, financed by the EU, has developed a new technology which is expected to contribute to the significant reduction of emissions in the European cement and lime industries. In its factory in Lixhe, LEILAC uses a system that captures pure CO2, released during lime calcination (CaO), which is possible due to the separation of the furnace exhaust gases. This elegant solution does not require

LEILAC 1 Pilot plant at the HeidelbergCement plant in Lixhe, Belgium



chemicals or additional processes to obtain a pure CO2 flow. On the project's website it is mentioned: "When making lime or cement CO2 is released as an intrinsic part of the production process and cannot be avoided (for example by using renewable energy). As such, carbon capture is the only realistic means by which these industrial emissions can be further reduced to support EU to be carbon neutral by 2050."

"It is simply a new type of furnace, whose design allows an intrinsic separation of CO2, which comes out cold and very pure, which makes it a potentially valuable raw material for existing niche markets, such as greenhouses and mineralization in the cement industry," explains Daniel Rennie, Calix company representative who coordinates the LEILAC project. The project lasted from May 2019 until the end of 2020.

Following LEILAC success, it was decided to develop a second project, LEILAC 2. It refers to a new reactor, with a size equivalent to approximately one fifth of that of a commercial cement factory and will focus more on the final destination of CO2 extracted during the process and, possibly, by the electrical production of the heat needed to obtain clinker. LEILAC will keep approximately half of the previous partners, especially Calix and HeidelbergCement.

"We want to be ready from a technological point of view once the carbon price makes the solution viable. If we don't do it now and if we wait until the carbon price is set at 100 euros per ton, it will take another ten years and we have no time to lose," says Jan Theulen, from HeidelbergCement, project partner.

Germany develops the Catch4climate project

For the first time, four European cement producers - Buzzi Unicem SpA-Dyckerhoff GmbH, HeidelbergCement AG, SCHWENK Zement KG and Vicat SA - join forces to cope with a major challenge: to contribute to the significant reduction of cement-related CO2 emissions. The Catch4climate project will allow the reuse of captured CO2 as raw material in other industrial processes. Therefore, the European cement industry will be able to significantly reduce its CO2 emissions, bringing a major contribution to climate problems.

At the end of last year, the four European cement producers that form the Cement Innovation for Climate (CI4C) joint-venture signed a Letter of Intent on the following steps of the Catch4climate pilot project.

This project consists of creating a pre-industrial demonstrator of the Oxyfuel technology, on the site of the SCHWENK cement factory in Mergelstetten, Germany. Oxyfuel Technology Oxyfuel principle ('oxygen and fuel') is based on the introduction of pure oxygen into a cement kiln instead of ambient air, to ensure the production of heat at high temperatures necessary for the manufacture of the clinker. In this way, the gases resulting from combustion are very pure in CO2, which greatly facilitates its capture.

Lengfurt cement factory in Bavaria, Platinum certified

In mid-May this year, HeidelbergCement completed a campaign of certification of the Concrete Sustainability Council (CSC) at the 10 cement plants, 12 concrete factories and five aggregates sites that were subject to the certification process. Lengfurt cement factory in Bavaria and two concrete factories have obtained the Platinum certification. Lengfurt factory is the first cement factory in Germany with Platinum certification.

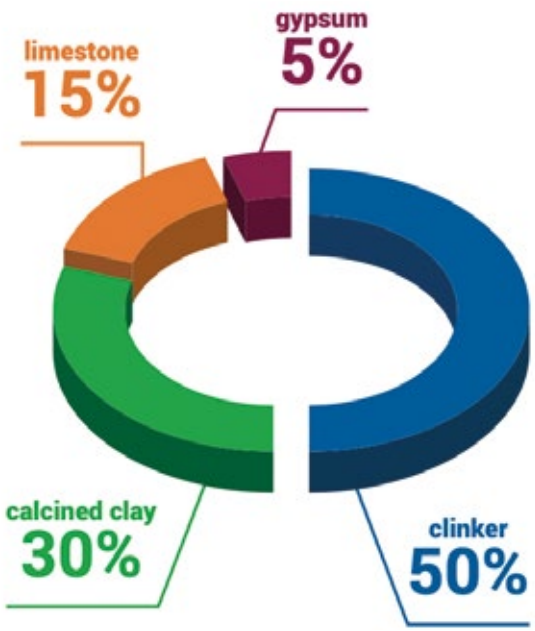
"CSC certification allows production sites to gain a holistic understanding of their sustainability performance and our successful engagement in CSC certification highlights our commitment to sustainability," points out Christian Artelt, senior manager sustainable construction and public affairs.

Carbon-free cement, an ecological innovation Made in France

In France, Lafarge, Ciment Calcia, Hoffmann Green are companies in the cement industry that propose carbon neutrality in their production chain, by 2050.

In 2020: CEM II/C-M (M for mixture) and CEM VI are the so-called 'ternary' blends, i.e., composed of clinker, cement compounds (slag, ash or pozzolan) and limestone. Their clinker content varies from 50 to 65% for CEM II/C-M and from 35 to 50% for CEM VI.

In 2021: LC3 (calcined clay limestone cement), composed of clinker, limestone and metakaolin



(calcined clay), LC3 cement has a higher physical strength than current cements and an environmental footprint reduced by 35 to 40% compared to CEM I. This type of cement will be included in the European standard EN 197 -1, which is the benchmark in Europe. This composition offers mechanical performance and durability similar to current cements, with a reduction of the environmental footprint from 35 to 65% compared to CEM I, the cement used for the construction of structures.

Research is currently underway to develop new clinkers, characterized by a lower formation temperature and which allows a reduction of the environmental footprint by about 30%.

Such projects include the ECO-Binder European Research Project, which brings together 14 partners, cement producers, laboratories, and technical control offices. So far, the results suggest that for a 30% reduction of the environmental footprint there will be a gain of 20% in thermal insulation properties and an increased fire resistance capacity. At normative level, a specific standard will be necessary, at which the ECO-Binder project is already working in close collaboration with the European Committee for Standardization CEN/TC51.

HGCT – 'carbon-free cement'

Hoffmann Green Cement Technologies (HGCT) is a pioneer in its field, as it is the first in the world to offer carbon-free cement. The objective of HGCT Hoffmann Green Cement Technologies is to reduce carbon emissions related to the cement manufacturing process: zero waste, zero discharge, zero inconvenience, no quarry, use of renewable energy and manufacture of environmentally friendly short-circuit products. They use three innovative technologies: H-P2A, H-UKR and H-EVA. These acronyms represent the manufacture, conservation of natural resources and perfect compatibility with current manufacturing procedures. Each of these technologies symbolize a green cement adequate for each specific need.

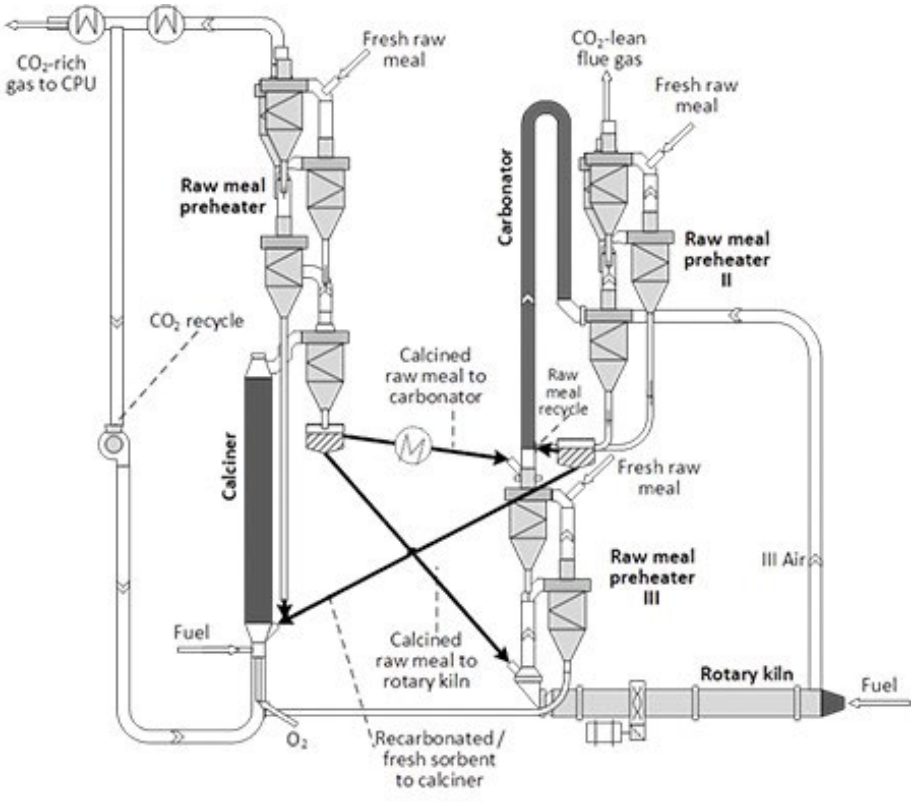
H-P2A is used to create 100% mineral adhesives, H-UKR is intended for the industrial concrete market (ready mixed), and H-EVA is dedicated to mortar and plaster, construction concrete and road binders.

Italy. Green cement, an emergency!

If the situation was already worrying in recent years, the image of the Ispra 2020 land use report in Italy is alarming.

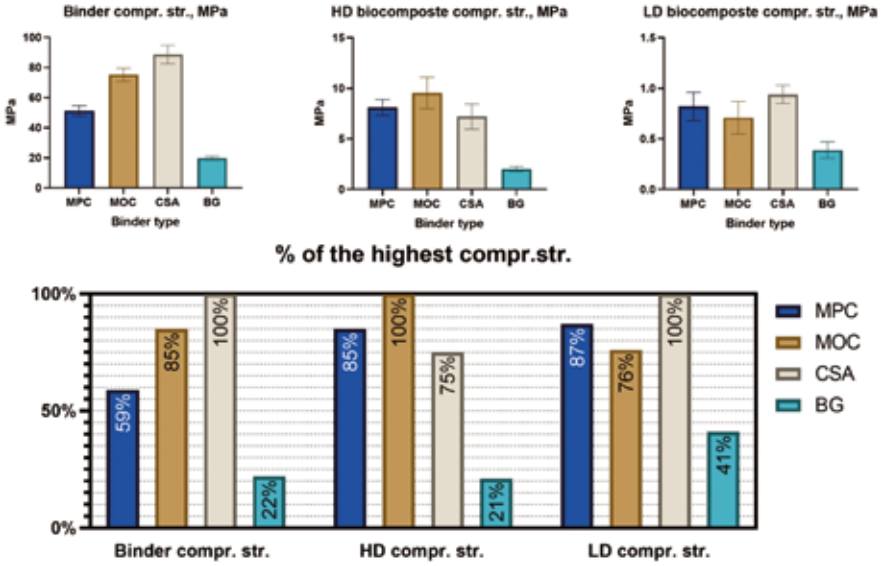
Two square meters of concrete are produced every second. And this clearly means that two square meters of green or, in any case, of soil are irretrievably erased. In the largest cities, that is metropolis, the year 2019 recorded the loss of 24 square meters per hectare of green area. Overall, about 50% of national soil losses in the last year are concentrated in urban areas, 15% in central and semi-central areas, 32% in peripheral and less dense areas. The eight ball goes to Rome with a loss of 75 hectares in total (of which 57 ha in the green areas of the city). Milan devoured 11.5 hectares of land in one year (of which 11 are green areas). Turin is the only city that stands out with the least land loss, remaining the only positive reality in this bleak image.

As far as regions are concerned, Veneto has some of the largest losses: over 923 hectares. It is followed by Lombardy (633 hectares), Puglia (425), Emilia-Romagna (381) and Sicily (302).



ECO-Binder project in Italy, Romania, Spain, and the UK

The ambitious ECO-Binder project, financed by the EU, continues in five testing locations in Italy, Romania, Spain, and the UK. Specialists aimed to develop an environmentally friendly solution to drastically reduce the carbon footprint of concrete manufacturing. However, the objectives of the team went much further. Researchers took advantage of the opportunity of integrating more safety, comfort, and stability in a single package of



products at a competitive price. Concrete is formed by mixing a binder, usually cement, with water. Belite-Y and Ye'elimite-Ferrite (BYF) cement binders are a family of environmentally friendly materials. The performance of the new class of cements is comparable to that of OPC. However, lower calcium content, lower combustion temperature and lower energy demand for grinding result in approximately 30% less CO2 emissions associated with concrete production.

In 2018-2020 (the first two years of the four-year project), the team demonstrated the feasibility of prefabricated elements combining new BYF binders and the manufacture of advanced functional finishing materials.

Proven success

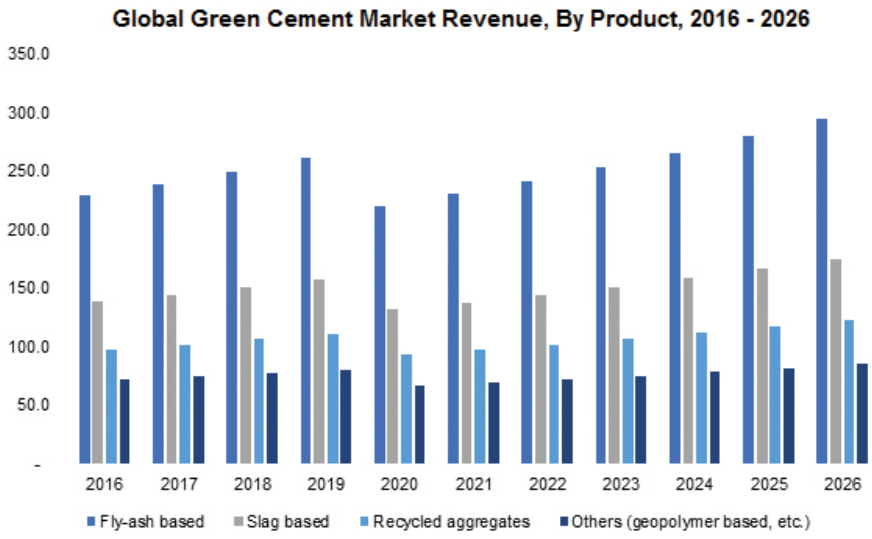
Four different concrete materials, manufactured with three BYF and OPC cements were used at small-scale models in Romania, Spain, and the UK and at a testing plant in Spain.

According to Arianna Amati, coordinator of the project, the target reached was large-scale production of BYF concrete. 11-meter-high monolithic panels were installed and tested in a real-world scenario on the demonstration site in Mantua, Italy. "165 m2 of facade of the structure were built with prefabricated BYF concrete components in order to demonstrate the complete replacement of the OPC-based product on a full scale," explains Arianna Amati. The tests of these small- and large-scale models have confirmed the success of project objectives. Prefabricated panels with the new BYF products showed a 24% lower 'gray energy', as well as a 24% reduction in carbon footprint. Moreover, insulation properties were improved by 10%. Lower hygrometric shrinkage of BYF concrete (higher dimensional stability) without the use of additives has led to a reduction in air losses. All of these were delivered at a cost 15% lower than conventional OPC products.

Poland: Cement, gypsum, plaster, and mortar obtained from ash

In turn, Poland is facing high costs for fulfilling the European agreement to reduce CO2 emissions by 40% by 2030 and for reaching carbon neutrality by 2050. The Polish Cement Association (SPC) has forecast a 2% year-on-year drop in cement sales to 18.5 million tons in 2021. In 2020, cement imports made by Poland with Belarus increased by 80% (440,000 tons) and those in Ukraine climbed by 50% (around 32,000 tons). SPC has expressed its firm support for the European Carbon Border Adjustment Mechanism (CBAM) as a means of protecting industry against imports from both non-EU neighbouring countries and through polluting transport from cement exporters abroad, such as in Turkey.

EKO-ZEC, a Polish subsidiary of Veolia, collects ash from burning coal and uses it in cement production. Since the beginning of 2017, part of the surplus was exported to other European countries. EKO-ZEC produces up to 650,000 tons of ash per year, a figure that exceeds by far the local demand, especially in winter months, when there are fewer sites and demand for concrete is lower, and the surplus is obviously exported, especially to countries with fewer coal-fired power plants. Due to these new distribution channels, EKO-ZEC and Veolia contribute to circular economy in Europe!



Source: www.gminsights.com

Romania. ECOPact - the widest range of green concrete in the industry

Local cement market had a value of EUR 630 million in 2020, according to data from the National Institute of Statistics. Compared to EUR 570 million in 2019, it results in a 10% growth of this sector last year.

2021 brought, through Holcim, for the first time in the industry of building materials in Romania, ECOPact - the widest range of green concrete in the industry, with CO2 emissions reduced by over 30%, created to accelerate transition to sustainable construction. At the same time, the company develops a new business model - ECONCEPT, which is based on three complementary directions: ECO Solutions (green products and solutions, with low CO2 footprint); ECO Services (consulting and instruments for building sustainable projects) and ECO Score (evaluation and certification of climate performances of products in the portfolio). The new range of green concrete has a wide range of uses, from residential and non-residential civil constructions, industrial and hydrotechnical constructions, special industrial constructions and to special constructions for water transport and marine structures.

With the new business model, the company has set new targets in terms of sustainability, in accordance with the 'Net Zero' commitment that LafargeHolcim Group signed up to last year, at global level. The latter has the goal of reaching CO2 emission neutrality by 2050.

Switzerland. LC3, one of the technologies with the greatest potential to reduce CO2 emissions

A consortium led by the Federal Polytechnic School of Lausanne (EPFL) has received support from the Swiss Agency for Development and Cooperation (SDC) worth more than 4 million francs to accelerate the development and testing of a new type of cement with low impact on the environment. Developed in partnership with the Institutes of Technology in India and various universities in Cuba and Brazil, this product based on a mixture clay and limestone could replace up to half of the traditionally used Portland cement, reducing by up to 40% CO2 emissions caused by this material. Researchers, who have actively collaborated with industrial and government partners, hope to make LC3 the new benchmark for the largest companies in the field. Two industrial-scale pilot projects, carried out in India and Cuba, have already proven the efficiency of the product and ease with which it can be integrated into the current production chain. "If we truly want to make concrete more attractive in terms of durability, cost, availability and environmental impact, we must act before demand explodes in developing countries," concludes Karen Scrivener, who heads EPFL's Building Materials Laboratory.

LC3 - short history

In 2004, prof. Karen Scrivener from EPFL Switzerland and prof. Fernando Martirena from UCLV Cuba discussed for the first time about the use of calcined clays for pozzolans, and in 2005, the two professors launched together the first research project on this topic supported by the Swiss National Scientific Foundation (SNSF) and the Swiss Development Agency and Cooperation (SDC). In 2009, a second project supported by the SNSF and SDC on materials research began to focus on ternary blended cement with clay and limestone. During this project, from 2009 until 2012, the huge potential of calcined clay was fully recognized.

In 2013, EPFL started a global project: cement from calcined clay. In addition to the laboratory in Cuba, it was decided to open a second laboratory in India, due to the significant potential to increase the volume of construction materials.

In 2014, the first three-year phase of the LC3 project had as main objective the technical verification of LC3 technology. It involved the development of an academic network

for the research of LC3 cements. Consequently, it could be proven that LC3 achieves OPC - CEM I quality and is suitable for global launch.

From 2017 until 2020, the SDC financed another three-year phase with the same team of academic partners in Switzerland, Cuba, and India. Within this phase, the LC3-Project mainly worked on verifying the economic attractiveness of the material and increasing the awareness in industrial and policy circles. Several LC3-applications were built in different parts of the world that are exposed to different environmental conditions. During the phase academic, industrial and policy circles widely acknowledged LC3 as one of the technologies with the highest potential to lower CO2-emissions in the cement sector. Also, the first permanent large-scale production of LC3 started within the second project phase in Colombia.

Since September 2020, the LC3-Project extends its technology globally. Several new LC3-productions are on the way. The project has received high attention by Bloomberg and TED-talks.

Houses of the future without cement?

Northern countries do what they do best: they are always one step ahead in terms of environmental protection.

As part of a pilot project supported by green funds from the Danish Ministry of Environment, architects from Een til Een have built the world's first house from waste and scrap materials from the agricultural industry. Whilst houses made from natural materials are nothing new, as numerous examples can be found in the huts of tribes living in jungles and forests around the world, in this case they are made from materials that have undergone a process of transformation and recycling. Hay and rice straw, reed, hemp, flax, algae and other cellulosic fibres, materials that are normally considered waste and are usually used as fuel for energy production, are given a new life in this project and become raw materials for construction. The CO2 captured by these materials is not re-emitted into the atmosphere as a result of their combustion. On the other hand, the recycling of locally available materials promotes the local economy. This 'organic' house, as the architects themselves have dubbed it, has been designed and produced using digital technologies. Moreover, it is a fully integrated building with natural ventilation and passive solar heating, not to mention that the recycled materials are breathable. The house also sits on screw piles, instead of the traditional concrete foundation, which means better insulation and ventilation, whilst at the same time having less impact on the land on which it stands. For the cladding, wood from local sustainable forests is used, with a special treatment, also biological, which makes it resistant, durable, and dimensionally stable.

The world's first 'organic' house, which aims to tackle ecological problems and global climate change, is part of the general trend towards green architecture. It is exhibited at the BIOTOPE ecological park in Middelfart, Denmark.

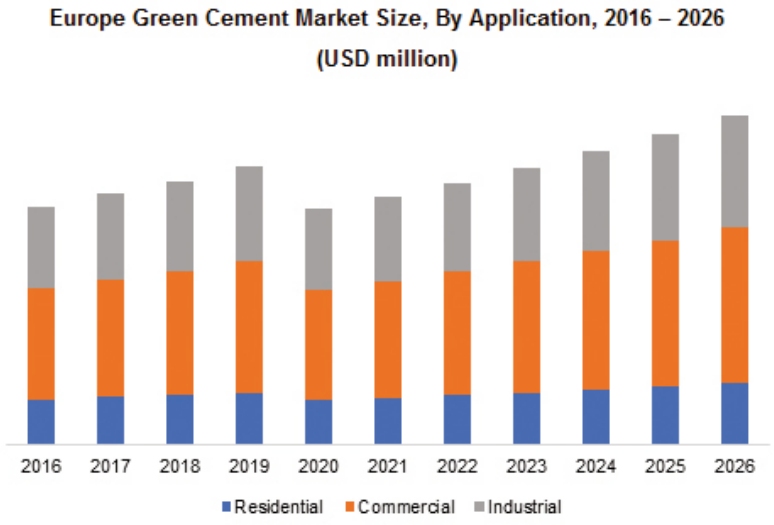
World's first house from waste and scrap materials from the agricultural industry. It is exhibited at the BIOTOPE ecological park in Middelfart, Denmark

The new generation of concrete – 'green' or not?

The building sector, a significant emitter of carbon dioxide, plans to make efforts in terms of sustainable development. For this, it relies a lot on 'green' cement, which would have the benefit of not containing carbon. But is green cement truly environmentally friendly?

The disadvantage of this essential binder is that it is not truly environmentally friendly due to the manufacturing process. Its manufacture is one of the most polluting on the planet, and manufacturers would like to find a solution to protect the planet. Of course, the idea is noble, but not as easy as it seems. And not by the 'green concrete' indication on the bags will this product be carbon-free.

The low-carbon method, according to the manufacturers, is to replace the treatment of limestone and clay with slag - waste resulting from the manufacture of steel. This is the shocking argument for proposing the so-called green cement. Furnaces that mainly produce steel, another element that goes into the construction of buildings, are not models in terms of sustainability.



Slag allows the use of 'blind' points in environmental calculation standards

In France, the Elioth design office team, a subsidiary of the Egis group, intrigued by the promises made by manufacturers to reduce CO2 emissions, took over the life-cycle analysis calculations for next-generation concrete.

The use of materials capable of not emitting carbon into the atmosphere or even storing it is gradually becoming essential. It's about meeting the commitments assumed in France at COP 21 and the Paris Agreements signed in 2015, which translates into the National Low Carbon Strategy (SNBC). Traders support the low-carbon qualities of almost all materials, and concrete is no exception, as manufacturers now offer qualified 'low-carbon emission' ranges.

"These calculations are caricatural because, under certain conditions, a concrete floor had a carbon footprint comparable to that of a wooden floor," said Guillaume Meunier, deputy director responsible for the environment division at Elioth.

Reducing the carbon footprint of so-called low-carbon concrete involves replacing part of the cement clinker with blast-furnace slag. The whole carbon footprint reduction trick looks at the LCA of this slag, which has an almost ridiculous carbon footprint through calculation tricks. Slag is a 'waste' of the steel processing industry. Waste, improperly said, because it is now used to justify all low-carbon concrete. 95% of the slag is sold at a rate of 82% to cement producers, at a selling price ten times higher than the real value.

The fact that slag is a by-product allows it to use blind spots in environmental calculation standards in order not to consider its impact on the environment.

On the one hand, we have steel producers who consider slag to be a material that avoids the use of clinker and, therefore, logically (from their point of view) subtract from the balance the difference between the carbon footprint of clinker and that of concrete products. This is therefore a 'negative' value that can be deduced from the steel LCA.

New cements blocked by the European Commission

In mid-2019, the European Commission called into question the legality of the mandate review procedure, which aims to introduce new types of cement. Any revision of the standard for current cements is blocked. From a technical point of view, the subject has become legal. But the problem is even deeper, as most of the recently revised harmonized standards are technically robust, but do not apply because they are not cited in the 'Official Journal of the European Union' due to lack of compliance. The technical document is expected to reach the CEN survey, and if countries vote positive, we can have a new normative document. At the same time, each cement manufacturer develops its own strategy for greening its ranges.

Two ranges of 'low carbon' cement: CEM II/C-M and CEM VI. The so-called 'ternary' are composed of clinker, limestone and cemented compounds.

The compounds can be made of slag from furnaces, but also to be the ash from thermal power plants or pozzolans - volcanic rocks. Their clinker content varies from 50 to 65% for CEM II/C-M and from 35 to 50% for CEM VI. These cements are no longer in the research and development stage but have been widely validated. However, they have not yet been produced and sold due to a legal deadlock in the European Commission that prevents their approval. "In order to introduce them, we need to revise the harmonized European standard that allows them to be placed on the market. But legal issues between the European Commission and the European Committee for Standardization prevent work from being completed. Cement companies intend to write a standard common to all member states, but to be applied at national level.

We need to move forward to meet the challenges we are being asked to meet, which is to reduce our CO2 emissions. The launch on the market is expected, at best, this year," says Xavier Guillot, head of standards coordination at LafargeHolcim. ■

Subscribe now,
it's only € 145 for 1 year!

Why subscribe to Energy Industry Review?

Stay informed and keep in touch with Romania's and the regional energy community. We will take you on a journey with interviews, analyses, various points of view, technical and innovative solutions & ideas to grow and expand your business.

Scan to Subscribe

or email us

E: office@energyindustryreview.com

AN EVENT POWERED BY CCIPH

Energy Market Liberalization in Romania

Prahova Chamber of Commerce and Industry (CCIPH), in collaboration with the Ministry of Energy, the National Regulatory Authority for Energy (ANRE) and the Petroleum-Gas University (PGU) of Ploiesti on May 20 organized an event-debate on the topic of energy market liberalization in Romania, in which Energy Industry Review was one of the media partners.

by **Daniel Lazar**

Within this event, which enjoyed the presence of over 80 participants - officials, institutional guest and representatives of the business community, the following topics were subject to debate:

- What does the energy market liberalization mean
- What is the difference between a distributor and a supplier
- What does the energy bill contain
- How to change the energy and gas supplier
- What happens if the supplier is not changed
- What are the benefits of liberalization
- How can one reduce the electricity and gas bill.

The event was opened by the President of Prahova Chamber of Commerce and Industry, Aurelian Gogulescu.

In his speech, he stated: "Energy market liberalization in Romania is a real challenge for all actors involved - government authorities, regulatory authorities, suppliers, and consumers, but also a very important step forward, as it means elimination of the regulated price, practiced so far, and allows the customer to choose the offer that suits him best. The fact that today's webinar brought together all these actors, to make an exchange of information very useful to everyone, on a highly topical issue, is for CCI Prahova an important reason of satisfaction and therefore I would like to thank all our partners for the organization."

In the opening session, George-Sergiu Niculescu - Secretary of State in the Ministry of Energy and Ph.D. Prof. Habil. Eng. Florinel Dinu - Rector of the Petroleum-Gas University of Ploiesti also participated and took the floor during the debate.

Ph.D. Prof. Eng. Filip Carlea - Director of the Centre for the Promotion of Renewable Energy and Energy Efficiency, attached to the Romanian Academy, made a presentation about energy market liberalization in the national and European context.

On behalf of the National Regulatory Authority for Energy participated Claudiu Dumbraveanu - Director General, Energy Market General Directorate, and Alina Tache - Director, Retail Energy Market Directorate, which together with two independent experts in the energy market - Vasile Ailene and Madalin Dinu, answered the questions and issues raised, during the question-and-answer session.

"Energy market liberalization in Romania is a real challenge for all actors involved - government authorities, regulatory authorities, suppliers, and consumers, but also a very important step forward, as it means elimination of the regulated price, practiced so far, and allows the customer to choose the offer that suits him best. The fact that today's webinar brought together all these actors, to make an exchange of information very useful to everyone, on a highly topical issue, is for CCI Prahova an important reason of satisfaction and therefore I would like to thank all our partners for the organization."

Aurelian Gogulescu, President of Prahova Chamber of Commerce and Industry

As usual, the actions organized by CCI Prahova were also attended by traditional partners of the Prahova Chamber Organization: Cornel Nitu - President of CECCAR Prahova, Florin Duma - President of Prahova SME Employers and Giovanni Baldantoni - President of Palazzo Italia Bucharest.

According to PGU Ploiesti Rector, Ph.D. Prof. Habil. Eng. Florinel Dinu, "The fact that regulated energy tariffs are eliminated is a good thing, and the initiative of CCI Prahova to organize this event, which is aimed at answering many questions related to this process, is extremely beneficial. I can tell you that, so far, 80% of energy consumers in Romania have remained at the same supplier and 20% of the total number of consumers have concluded such contracts."

Currently, the process of changing the energy supplier lasts maximum 21 days.

In the EU regulations have been prepared so that, by 2026, the technical process of changing the supplier to be completed within 24 hours. The project refers to the realization and implementation (at national level) of an online platform that optimizes the operational processes in the energy market - generated by the requests to change the electricity and natural gas supplier by managing the information flow in an automated way.

The IT platform will use the unique database at national level for approximately 13 million household and non-household customers, of which: approximately 9 million consumers of electricity and approximately 4 million consumers of natural gas. A unique online accessible system will also be used for market participants involved in changing the supplier. The value of the project is approximately RON 20 million, being co-financed from the European Social Fund (ESF), through the Operational Program Administrative Capacity (OPAC) 2014-2020.

"Romania is the last country in the EU where the electricity market hasn't been liberalized, which was mandatory under the European legislation," the Director of the Centre for the Promotion of Renewable Energy and Energy Efficiency outlined.

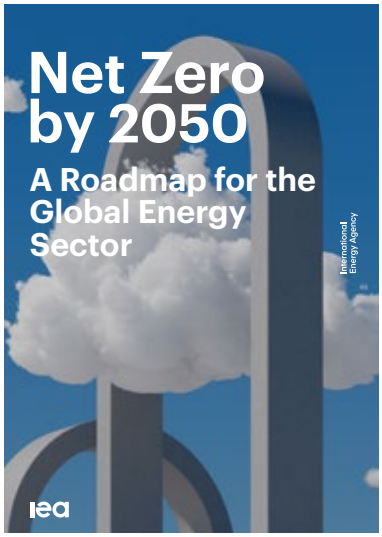
Net Zero by 2050

The global pathway to net-zero emissions by 2050 detailed in this report by IEA requires all governments to significantly strengthen and then successfully implement their energy and climate policies. Commitments made to date fall far short of what is required by that pathway.

The number of countries that have pledged to achieve net-zero emissions has grown rapidly over the last year and now covers around 70% of global emissions of CO2. This is a huge step forward. However, most pledges are not yet underpinned by near-term policies and measures. Moreover, even if successfully fulfilled, the pledges to date would still leave around 22 billion tonnes of CO2 emissions worldwide in 2050. The continuation of that trend would be consistent with a temperature rise in 2100 of around 2.1 °C. Global emissions fell in 2020 because of the Covid-19 crisis but are already rebounding strongly as economies recover. Further delay in acting to reverse that trend will put net zero by 2050 out of reach.

IEA outlines the essential conditions for the global energy sector to reach net-zero CO2 emissions by 2050. The pathway described in depth in this report achieves this objective with no offsets from outside the energy sector, and with low reliance on negative emissions technologies. It is designed to maximise technical feasibility, cost-effectiveness and social acceptance while ensuring continued economic growth and secure energy supplies.

The document highlights the priority actions that are needed today to ensure the opportunity of net zero by 2050 – narrow but still achievable – is not lost. The report provides a global view, but countries do not start in the same place or finish at the same time: advanced economies must reach net zero before emerging markets and developing economies and assist others in getting there. IEA also recognises that the route mapped out here is a path, not necessarily the path, and so they examine some key uncertainties, notably concerning the roles played by bioenergy, carbon capture and behavioural changes. Getting to net zero will involve countless decisions by people across the world, but the primary aim is to inform the decisions made by policy makers, who have the greatest scope to move the world closer to its climate goals.



Find the report at www.iea.org

The path to net-zero emissions is narrow: staying on it requires immediate and massive deployment of all available clean and efficient energy technologies. In the net-zero emissions pathway presented in this report, the world economy in 2030 is some 40% larger than today but uses 7% less energy. A major worldwide push to increase energy efficiency is an essential part of these efforts, resulting in the annual rate of energy intensity improvements averaging 4% to 2030 – about three-times the average rate achieved over the last two decades. Emissions reductions from the energy sector are not limited to CO2: in the IEA's pathway, methane emissions from fossil fuel supply fall by 75% over the next ten years as a result of a global, concerted effort to deploy all available abatement measures and technologies. ■

HABAU
PPS PIPELINE SYSTEMS

Honor
sAfety
responsiBility
Achievement
qUality

Plant construction

Pipeline construction

Civil works projects

EPCC projects

Drilling projects

www.habau.com
www.pipelinesystems.de

Sinaii Street, № 3, Floor 1-3
Ploiesti, Prahova, 100357
ROMANIA

Phone: +40 244 595940
+40 244 406616
+40 244 406621
Fax: +40 244 595942
E-mail: office@habau.ro