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JUNE 2020

ENERGY

INDUSTRY REVIEW

PLANS FOR A DECADE

Transgaz Role on the Regional Gas Market

REVERSING THE DAMAGE FROM COVID-19

World's Biggest Green Recovery Spending Program

HYDROGEN FUEL

Is This the Future?

Alexandra Damascan-Armegioiu

Serinus Energy President Romania on Long-term Plans in Our Country


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Romgaz is the largest natural gas producer and the main supplier in Romania.
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Is the Bet on Renewable Energy the Winning One?

At a time when the major oil producing countries decide production and price, which has an effect fully felt by the economically vulnerable states or those with major oil consumption in their economy, and for the extracted gas resources regional networks are required for pipeline transmission, more and more bet on renewable energy. Whether we are talking about solar, wind energy or solid biofuels (including renewable waste), investments in the field are higher than ever and this is also due to the fact that, at least at in terms of statements and PR industry, global warming must be tackled.

Statistical data show that, in 2018, wind energy was the only and most important source of electricity generation from renewable sources in the EU, as the quantity of electricity produced from hydropower was relatively similar to the level recorded a decade earlier. In turn, the quantity of electricity generated at EU level based on solar energy and wind turbines was by 15.5 times and 2.9 times higher respectively in 2018 than in 2008. Therefore, the increase in the quantity of electricity generated based on solar power was significant, recording an increase from only 7.4 TWh in 2008 to 115.0 TWh in 2018.

In 2018 (the last year for which official data are available), energy from renewable sources accounted for 21.1% of the total energy consumption for heating and cooling in the EU, which is a significant growth, from 11.7% in 2004. Among EU Member States, the variation is significant. In Austria (73.1%), Sweden (66.2%) and Denmark (62.4%), at least three-fifths of total electricity consumption was generated from renewable energy sources. Largely due to the use of hydropower and wind power - while more than half of the electricity used in Latvia (53.5%) and Portugal (52.2%) came from renewable energy sources. On the other hand, in Cyprus (9.4%), Luxembourg (9.1%), Hungary (8.3%) and Malta (7.1%), the share of electricity generated from renewable sources was less than 10%. Sweden has by far the largest share of renewable energy among EU Member States, with more than half of the gross final energy consumption (54.6%), followed by Finland (41.2%), Latvia (40.3%), Denmark (36.1%) and Austria (33.4%). On the other hand, the lowest shares of energy from renewable sources were recorded in the Netherlands (7.4%), Malta (8.0%), Luxembourg (9.1%) and Belgium (9.4%).

In 2018 (the last year for which official data are available), energy from renewable sources accounted for 21.1% of the total energy consumption for heating and cooling in the EU, which is a significant growth, from 11.7% in 2004.

With the freezing of the economy (and industry, by default) on most of the world's meridians, electricity consumption has also declined. Now it remains to be seen whether and how long it will return to pre-pandemic levels. That's because, based on the recent surveys, the following immediate impacts are frequently highlighted: changes in electricity demand patterns; decrease in coal and oil consumption; priority development of digitalization in energy processes; the impact of the supply chain disruption and the delay of construction projects of power plants from renewable energy sources; greater focus on energy storage development projects.

For the energy systems, experts believe that impact will decrease progressively, from a maximum in the first three months to 18 months. Moreover, we expect a war of low oil prices to start, with implications primarily on the energy sector, but also with important changes in the energy mix of countries. ■

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ANALYSIS

Electrica, Hidroelectrica and SAPE Interested in Acquiring CEZ Romania

Electrica informs shareholders and investors that it is currently exploring the possibility to participate, within a potential consortium formed together with Societatea de Administrare a Participatiilor in Energie S.A. (S.A.P.E. S.A.) and Societatea de Producere a Energiei Electrice in Hidrocentrale Hidroelectrica S.A., in the competitive procedure organized by CEZ a.s. for the sale of its subsidiaries in Romania.

Electrica also announces that it will promptly inform shareholders and investors on any aspects regarding the potential participation in the project, which will have to be reported in accordance with the applicable legal provisions. It should be noted that the sale of any stake in energy companies was suspended by the Government during the state of emergency.

Hidroelectrica has already presented its interest and is ready to submit the final bid, alone or in consortium, for CEZ assets in Romania. Shareholders' approval is requested, in the EGMS scheduled for June 25, for submitting a binding bid of Hidroelectrica, alone for the entire perimeter of the transaction or in consortium, within the deadline set by CEZ a.s., within the process of selling the CEZ Romania Group. At the same time, shareholders are expected to approve the partner with which Hidroelectrica will form a consortium and submit a joint binding bid.

Initially, Electrica had shown its interest in CEZ assets in consortium with SAPE.

Other interested investors are: investment funds Macquarie, from Australia, DWS - the investment fund of Deutsche Bank, OMV Petrom Group and the Hungarian state-owned operator MVM.

Funds of EUR 1bn for Companies Affected by Pandemic

EUR 1bn funds from the Ministry of European Funds could enter the budget of the Ministry of Economy, Energy and Business Environment (MEEMA), to be made available to companies in the sectors affected by the crisis created by the COVID-19 pandemic.

At a first evaluation, approximately EUR 350mln could go to companies in HoReCa and transports, and approximately EUR 100mln could be granted as vouchers to companies that had no employees. It is intended that the rest of EUR 550mln be distributed to companies that plan to start production.

"We are considering to offer under this program grants of up to EUR 800,000/ beneficiary, which could be distributed to middle-sized and large industry and trade companies. We are trying not to do anything restrictive. We are trying to have a selection basis as fair as possible, and controls to take place after giving the money. The entire procedure will take place online," said Liviu Rogojinaru, Secretary of State within MEEMA.

OWS Romania Receives API 7-1 Monogram for its New Repair Facility

Odfjell Well Services (OWS) has been awarded the API Spec 7-1 Monogram License for its new repair shop in Ploiesti, Romania; a demonstration of its commitment to ensuring drill string elements are serviced and repaired to the highest possible standards.

OWS established its first operational base in Romania in 2012, which has quickly become a hub for its geographical expansion in the region.

Achieving API certification is no small task, with OWS investing in new technologies, specialist training, and extensive internal audits to ensure compliance across all processes. The facility has been equipped with Hankook Protec 9N Series CNC Horizontal Lathes and an automatic tubular handling machine, eliminating the need for manual operations. These technologies enable high-quality and efficient connection refacing, repairs, and new connection machining; cold working to increase equipment fatigue life, and phosphate coating of the pin and box to improve corrosion resistance.

Depomures and Depogaz to Invest EUR 192mln in Increasing the Gas Storage Capacity

Depomures and Depogaz will invest EUR 192mln to increase the underground gas storage capacity for two national storage facilities, located in Targu-Mures and Sarmasel (**photo**), projects approved by the National Regulatory Authority for Energy (ANRE).

These projects modernize the existing facilities by increasing the underground storage capacity in the case of Depomures (the Targu-Mures facility) from 200 million cubic meters/cycle to 300 million cubic meters/cycle and in the case of Depogaz (Sarmasel facility) from 900 million cubic meters per cycle to 1550 million cubic meters per cycle, respectively by increasing gas injection and withdrawal flows. Therefore, the total underground gas storage capacity of Romania will grow from 3.07 billion cubic meters (bcm) to 3.82bcm.

"The total value of the investment projects is around EUR 192mln. Of this value, the two project initiators are entitled and plan to apply for obtaining grants for works of around EUR 80mln under the Connecting Europe Facility (CEF), implemented based on the Regulation (EU) no. 1316/2013 of the European Parliament and of the Council," ANRE informed.

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Resalta Enters Romanian Market

The energy services provider Resalta, based in Ljubljana, established a firm together with Next Energy Partners, a leader in the development of renewable energy and energy trading in Romania.

Resalta has reached a new milestone, entering the 10th market in which it will continue with its mission to provide energy efficiency services and develop renewable energy projects.

Resalta and Next Energy Partners' joint venture will be adapting its energy services portfolio to the needs of the Romanian market and will focus its service offering on solar PV, combined heat and power projects and industrial lighting.

FPPG: Digitalization of the O&G Industry Blocked by the Legislative Framework

Digitalization is inaccessible to oil and gas companies in Romania, without declassifying data and information from the oil industry, says the Federation of Employers of Oil and Gas (FPPG) in a public letter sent to Prime Minister Ludovic Orban. For this, updating the legislative framework is required in order to adapt it to technological progress, says FPPG.

According to the Federation, "technologies such as 'Cloud', 'Big Data' and 'Cloud Computing', which involve data processing in 'Cloud' data centers located in the European Union" are inaccessible to Romanian operators. "The classification of some data makes it difficult to use them and makes it impossible to capitalize on them through 'Cloud' technologies", insists FPPG. "By limiting access to digitalization for oil companies and authorities, they are kept at a disadvantage in competing for capital over other industries in the region or the global market. It is already known that easy access to data improves industry efficiency and, as a consequence, brings additional revenue to state revenue."

The need to use advanced information technology tools is even more urgent in the case of Romania, which has in operation mature fields, with a significant natural decline in production, adds FPPG, stating that "most industry-specific solution providers offer solutions only 'in cloud', the current solutions, locally installed, will come out of maintenance and services offerings".

OMV Petrom and Eldrive to Install 30 Fast Charging Stations for Electric Cars in Romania and Bulgaria

OMV Petrom will install 30 fast-charging stations for electric vehicles in OMV branded filling stations in Romania and Bulgaria. The implementation of the project will last approximately two years.

As a result of this initiative, Romania and Bulgaria will be connected through an infrastructure of 50kW fast-charging points located conveniently in the OMV branded filling stations. Eldrive will be the installer and operator of the charging

points. The first two stations of this project were already been installed in Bulgaria, in Daskalovo (Struma Highway) and Golyamokonarsko road (near Plovdiv), and have welcomed their first clients.

The new charging stations network will allow drivers to charge up to 80% of the electric vehicles battery in approximately 40 minutes, for a charging cycle. Three years ago, OMV Petrom was the first energy company in Romania to install, as part of a pilot project, a fast-charging point for electric vehicles at an OMV branded filling station.

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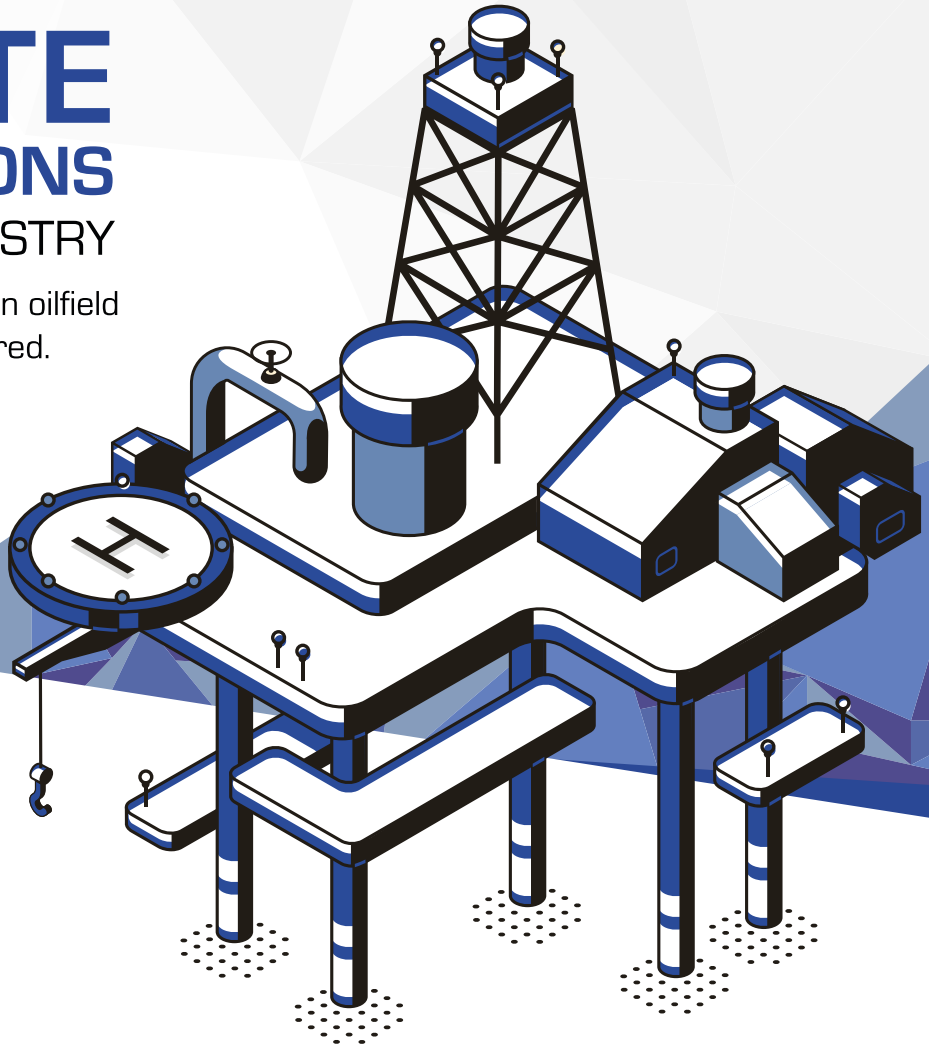

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Rompetrol, Growing Retail Activities in the First Four Months of 2020

KMG International Group continued for the first four months of the year to consolidate and develop its retail activities in the Black Sea region, by opening 12 new fuel stations, but also expanding the range of products and services offered.

The Group's subsidiaries managed in January - April to open a total of 12 new Rompetrol fuel stations in Romania, Bulgaria and Georgia, own fuel stations, as well as Rompetrol Expres and Rompetrol Partner fuel stations. In the next two months, they set out to complete and open 19 units (Romania - 11, Bulgaria - 1, Georgia – 4, Moldova - 3).

In Romania, Rompetrol Downstream - the retail division, managed to increase its distribution network with 7 new fuel stations, to which are added two new trading points of liquefied petroleum gas. The network operated by the company internally, currently, amounts 395 fuel stations (153 - own fuel stations, 242 - Rompetrol Partner and Rompetrol Express).

State Aids for Energy-intensive Companies in Romania for Indirect Emission Costs

Under EU state aids, the European Commission approved Romania's plans to partially compensate energy-intensive companies for the increase in prices for electricity generated by the indirect emission costs, under the EU Emission Trading Scheme (ETS). The scheme will cover the period 2019-2020, having a provisional budget of approximately EUR 291mln (RON 1.397bn).

The measure will bring benefits to companies in Romania active in the sectors facing significant electricity costs and which are particularly exposed to international competition. The compensation will be granted to eligible companies, by partial reimbursement of indirect costs generated by ETS.

The Commission has assessed the measure in accordance with EU state aid rules, especially the Guidelines on certain state aid measures in the context of the greenhouse gas emission allowance trading scheme post-2012 and found that it is in line with the requirements of the Guidelines. In particular, the scheme will avoid an increase in global greenhouse gas emissions due to companies relocating to countries outside the EU, with less stringent environmental regulation.

Winner of the National Final of the EIT InnoEnergy PowerUp! Challenge

Romanian start-up, WATTO, which develops a network of ultra-fast charging stations, has been designated the winner of the national final of the EIT InnoEnergy PowerUp! Challenge.

WATTO will represent Romania in the grand international final. This year's edition of PowerUp! Challenge was launched in January 2020 at European level, in order to find the most innovative start-ups, scale-ups and SMEs from the energy area in Central and Eastern Europe.

29 companies entered the national phase of the competition and 5 teams were selected to pitch their projects in the national final. These were Evinox (a smart heating solution), Paydemic (an app for the electric car charging), RF Meters (a wireless smart metering solution), TresOil Biofuels (a hydrogen fuel solution produced from locally collected waste), and WATTO (a network of ultra-fast power charging network).

Following the pitching session, WATTO was designated by the jury the winner of the EIT InnoEnergy PowerUp! Challenge national final. The company was founded in 2019 with the aim of creating a network of ultra-fast power stations, specially designed for personal electric cars, but also for commercial vehicles. The solution guarantees a charging level of 80% in less than 10 minutes. Thus, WATTO was awarded 'Start-up of the year' title at national level, got the invitation to represent Romania at PowerUp! Grand Final, and credits worth 10,000 euros offered by Amazon Web Services.

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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.

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- Project management
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  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

CO2 Emissions from Energy Use Decreased

Eurostat estimates that in 2019, the year before COVID-19 containment measures were widely introduced by EU Member States, carbon dioxide (CO2) emissions from fossil fuel combustion (mainly oil and oil products, coal, peat and natural gas) significantly decreased by 4.3% in the European Union of 27 Member States (EU), compared with the previous year. CO2 emissions are a major contributor to global warming and account for some 80% of all man-made EU greenhouse gas emissions. They are influenced by factors such as climate condition s (e.g. cold/long winter or hot summer), economic growth, size of the population, transport and industrial activities.

CO2 emissions from fossil fuels are generated in the country where the fuels are burned for purposes such as electricity generation, transport, steel production etc. Consequently, imports and exports of energy products have an impact: for example if coal is imported for electricity generation this leads to an increase in emissions in the importing country, while if electricity as such is imported, it has no effect on emissions in the importing country, as these emissions would be reported in the exporting country where the electricity has been produced.

Household Energy Prices in the EU Increased

On average, household electricity prices in the European Union of 27 Member States (EU) increased to EUR 21.6 per 100 kWh. This represents a 1.3% increase between the second half of 2018 and the second half of 2019, similar to the overall inflation rate (HICP) over the same period. Across the EU Member States, household electricity prices in the second half of 2019 ranged from EUR 10 per 100 kWh in Bulgaria to around EUR 30 per 100 kWh in Denmark, Belgium and Germany.

Household gas prices increased by 1.7% on average in the EU between the second semester of 2018 and 2019, about 0.4 percentage points more than the overall inflation rate (HICP) over the same period, to EUR 7.2 per 100 kWh.

Nevertheless, this is still EUR 0.3 per 100 kWh lower than in the second half of 2013, the peak of gas prices in the last ten years. Among Member States, household gas prices in the second half of 2019 ranged from below EUR 4 per 100 kWh in Romania, Hungary and Latvia to around EUR 9-10 per 100 kWh in Italy, the Netherlands and Spain and almost EUR 12 per 100 kWh in Sweden. Taxes and levies in the EU made up 41% of the electricity price paid by households in the second half of 2019, and 31% of the gas price.

First Magnet in the History of ITER

Fusion, the energy source of the sun and stars, could be the energy of the future. It has the potential to provide a safe, cost-efficient and sustainable solution to European and global energy needs. That is why the EU is part of one of the most ambitious energy projects in the world, ITER, a unique project to build the world's biggest fusion machine. Although a purely experimental device, ITER will help advance fusion energy technology for a greener and more sustainable energy mix. By fostering innovation and international collaborations, the project creates economic growth and job opportunities while putting the EU in the lead of global fusion research.

A huge magnet, the superconducting Toroidal Field coil was delivered and arrived at is final destination in Cadarache, in the South of France. The arrival of the massive component (17 metres high, weighing 310 tonnes) has set two records: this is the first magnet delivered in the history of the ITER project and the biggest component so-far handed over by Europe.

WesternGeco Completed Seismic Survey Offshore Egypt

Schlumberger's seismic and geophysical data solutions division has completed an ocean bottom nodes (OBN) multiclient survey in the North West El Amal block, offshore Egypt, delivering promising results for further analysis. The project, prefunded by Neptune, was carried out by WesternGeco under a contract with the Egyptian General Petroleum Corporation (EGPC), sponsored by the Egyptian Ministry for Petroleum and Mineral Resources. WesternGeco acquired the survey using third-party vessels.

The survey employed innovative OBN technology to overcome the challenge of acquiring improved imaging in the complex salt geometries of the Gulf of Suez. It was the first ever OBN seismic survey to be conducted in Egypt and the most detailed survey of the block since the first acquisition in 1988, providing an in-depth data set for processing, image analysis, and planning for potential exploratory wells in the future.

The North West El Amal offshore concession covers 365 km2 and is located in the central part of the Gulf of Suez, approximately 42 km south of Ras Gharib and 105 km north of Hurghada. Neptune was awarded the exploration licence in February last year, including the acquisition of 100 km2 of 3D seismic data.

Green Light for Odfjell Drilling's Deepsea Yantai to Drill for Neptune Energy

Norwegian offshore safety body, the Petroleum Safety Authority (PSA), has given its consent to Neptune Energy for exploration drilling in the North Sea using the Deepsea Yantai semi-submersible drilling rig. Neptune was awarded 13 new licenses on the Norwegian continental shelf in the APA 2019 licensing round, early in 2020. In the 2019 Annual Report, Neptune stated that further exploration wells are planned at Grind, Dugong and Blasto.

Odfjell Drilling's semisubmersible Deepsea Yantai will drill well 34/4-15 S and side track 34/4-15 A on the Dugong prospect in 331 m (1,086 ft) of water on license 882. The rig was built at the CIMC Raffles yard in China. It was completed in 2016.

The drilling campaign is expected to between 44 and 90 days, depending on the results.

Total Partners with CQC to Improve CO2 Capture

Total is stepping up its research into Carbon Capture, Utilization and Storage (CCUS) technologies by signing a multi-year partnership with UK start-up Cambridge Quantum Computing (CQC). This partnership aims to develop new quantum algorithms to improve materials for CO2 capture. Total's ambition is to be a major player in CCUS and the Group currently invests up to 10% of its annual research and development effort in this area.

To improve the capture of CO2, Total is working on nano-porous materials called adsorbents, considered to be among the most promising solutions. These materials could eventually be used to trap the CO2 emitted by the Group's industrial operations or those of other players (cement, steel etc.). The CO2 recovered would then be concentrated and reused or stored permanently. These materials could also be used to capture CO2 directly from the air (Direct Air Capture or DAC).

The quantum algorithms which will be developed in the collaboration between Total and CQC will simulate all the physical and chemical mechanisms in these adsorbents as a function of their size, shape and chemical composition, and therefore make it possible to select the most efficient materials to develop. Currently, such simulations are impossible to perform with a conventional supercomputer, which justifies the use of quantum calculations.

Total is deploying an ambitious R&D programme, worth nearly USD 1 billion a year. Total R&D relies on a network of more than 4,300 employees in 18 research centres around the world, as well as on numerous partnerships with universities, start-ups and industrial companies. Its investments are mainly devoted to a low-carbon energy mix (40%) as well as to digital, safety and the environment, operational efficiency and new products.

Virtual Server to Increase Efficiency and Safety of the 3D Field Modelling

DTEK Oil & Gas has created a virtual server that significantly increases the efficiency and safety of the 3D field modelling process. The virtual server was created for geology and field development specialists, who create 3D models of gas condensate fields in Petrel software package and work with over hundred gigabytes of data.

The virtual server will significantly increase the level of interaction while modelling deposits. Specialists located in different offices of the company, as well as external experts, will now be able to successively work on one 3D project. Employees can instantly obtain access to data from any computer, at any time, from any office, and quickly exchange this information with colleagues.

The new solution also provides centralized data backup, which increases the level of information security and minimizes the risk of data loss. The third advantage is the increased speed of calculations, modelling of deposits and enhanced efficiency. IT specialists of DTEK together with the DTEK Oil & Gas team implemented the project. They used Hewlett Packard equipment and VDI VmWare Horizon technology.

Chisinau's Green City Action Plan

The EUR 1.5 billion EBRD Green Cities programme has grown rapidly since being set up in 2016 and now covers 41 cities. It helps each city tailor solutions to its environmental needs with a unique combination of measures, all designed to move cities towards a lower-carbon and more liveable future. On joining the programme, cities undertake a trigger project and craft their own Green City Action Plan (GCAP).

The Chisinau's city council approved the Green City Action Plan as part of the Moldovan capital's participation in the EBRD's flagship urban sustainability programme, EBRD Green Cities. Chisinau was the first city in Moldova to join the programme; Balti has also signed up.

Funded by the government of Austria, the preparation of Chisinau's GCAP started in August 2018 and was completed in December 2019, with more than 350 residents taking part in a 2019 survey to select the actions to include in the plan.

As part of the GCAP, the city has committed to enhancing institutional capacities for the implementation, assessment and monitoring of the sustainable urban development process.

The plan includes another four strategic objectives: sustainable mobility and transport; climate-resilient 'blue-green' infrastructure; sustainable and efficient energy; sustainable resources and waste management.

Northvolt and Vattenfall Launch Battery Energy Storage System

Modular lithium-ion battery solution Voltpack Mobile System could be an alternative for diesel generators and more.

Northvolt has launched a new battery energy storage solution, Voltpack Mobile System– a rugged, highly modular lithium-ion battery solution envisioned as a zero-emission alternative to replace diesel generators. Vattenfall has supported the design of the system and will test and validate Voltpack Mobile System and its functionality prior to the market introduction.

Voltpack Mobile System will serve as a modular power supply solution which can be configured to meet energy and power requirements of a wide variety of market scenarios.

Prime applications include powering remote electricity grids, reinforcing weak grids, supporting electric vehicle charging and delivering grid services such as balancing power, flexibility, or other ancillary services.

Designed for redeployment, the system can be deployed for operations lasting days, weeks or even longer periods of time. This characteristic opens Voltpack Mobile System up to opportunities of leasing and is expected to significantly expand the system's utility.

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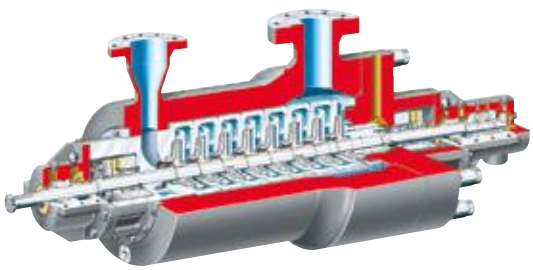


WIK Pump - according to API 610 (BB5) Standard

Green Energy Transition Will Continue in Spite of Pandemic Impact

Amidst the chaos, uncertainty, and coronavirus-induced investment slowdown, it is imperative that global leaders do not become distracted from economic initiatives that contribute to Europe's low-carbon economy transition. There is a big opportunity for the renewable energy sector (RES) to emerge even stronger from the current crisis.

The current crisis only emphasizes the challenges we are facing through global warming, the increasing spread of diseases, weather abnormalities, migration of unprecedented scale, and social and business disruptions. Global leaders must resist the sirens calling for protection of and subsidies for outdated polluting and resource-consuming industries.

While governments and financial institutions are declaring multibillion Euro rescue packages to stabilize hard-hit economies, we must ensure these funds are directed towards tackling the most pressing issues. Every Euro spend needs to be scrutinized for its impact towards a more sustainable, resilient, ecological and socially beneficial economy, which avoids mistakes of the past and directs investments to those areas which contribute to the well-being of our society and the future of our civilization.

To this end, recent statements from the President of the European Commission Ursula von der Leyen and major European leaders affirm that the green deal will serve as the 'motor for the EU's recovery'. Transparent and efficient policies, which will guide the future development of the renewable energy sector, must underpin the green deal. Effective government governance based on well-designed energy market systems and strategic vision can translate into a big opportunity for the sector to emerge even stronger from the current crisis.

What needs to be done now?

We need to stabilize current business operations. Companies constructing wind and solar facilities are facing major supply chain disruptions as global factories producing turbines, solar panels and mechanical and electrical equipment are yet to return to full capacity. Due to strict lockdown measures, the movement of goods has been impaired. Activities across construction sites have slowed down due to restrictions on the movement of people and health precautions.

On the positive side, renewable plants have experienced very few business disruptions. Decentralized renewable energy facilities have demonstrated their full potential during the crisis, contributing strongly to security of supply and energy independence. Faced with this unprecedented situation, the immediate priority for every RES company was to ensure the wellbeing of their workers and the continuity of their business. Where required, sector support must be provided as a temporary measure to ensure liquidity of RES businesses and to avoid large-

▶ **Philipp Leckebusch** *is the CEO of DTEK Renewables*

scale bankruptcies, which could pose a substantial risk to rapid economic recovery.

On the supply side, having previously predicted a fall in the price of solar panels in 2020 due to oversupply, consultancy Wood Mackenzie is now predicting supply delays late into the second quarter and price increases during the second half of the year. Given a sharp economic contraction, reduced demand for energy is also likely to impact on the availability of investment finance for further energy sector growth.

Measures to minimize the negative impact on businesses

Companies will need to put in place measures to minimize the negative impact on their businesses until markets and supply chains are stabilized, with the most realistic projections suggesting this will only happen in the third quarter of 2020.

So, with evidence pointing to a slowdown in the world's clean energy transition, how can we revive the renewable energy sector?

The underlying fact is that major trends in the energy industry have not changed. ESG investments have outperformed an admittedly declining market. MarketWatch recently concluded that ESG related companies on the S&P 500 have collectively outperformed the rest of the index by 33% since the beginning of the crisis. ESG investments, including renewable energy, are now a relative safe haven for investors. They are the new normal.

The current crisis has only confirmed the view of major think tanks and industry observers about the increasing volatility risk of conventional fuels for the energy industry, compared to much more predictable and commercially mature investment in renewables. With renewables now being competitive in most markets, this strengthens its position amongst investors and the long-term prospects of the renewable energy sector. However, the extent to which it recovers momentum will be disproportionately impacted by the various stimulus packages being assembled around the world.

The current crisis has only confirmed the view of major think tanks and industry observers about the increasing volatility risk of conventional fuels for the energy industry, compared to much more predictable and commercially mature investment in renewables. With renewables now being competitive in most markets, this strengthens its position amongst investors and the long-term prospects of the renewable energy sector.

Increasing investment in clean technologies and infrastructure

The IEA predicts that low-carbon sources are set to extend their lead this year to reach 40% of global electricity generation – 6% points ahead of coal. While a recently released report by IRENA has shown the enormous benefits that moving now to prop up the renewable sector could have on the post COVID-19 recovery. In its assessment, IRENA claims that a decarbonization path totalling USD 110 trillion would create significant socio-economic gains, generating savings of between USD 50 trillion and USD 142 trillion by 2050.

Working closely with the business community, governments need to recognize that by increasing investment in clean technologies and infrastructure they can help to regenerate growth whilst helping to realize their Paris agreement decarbonization obligations. The international financial institutions also can play a vital role in supporting renewable energy investment. In order to reap the full benefits of renewables, they need to provide the necessary stimulus and policy guidance to enable the market integration of renewables.

Ukraine to offer huge long-term potential for the integration and stabilization of European clean energy markets

Markets will increasingly promote growing B-to-B trade of renewable energy, serving the increasing decarbonization needs of industries, commercial businesses and households. The political will and vision of policy makers can provide a sustainable basis for attracting investments to countries like Ukraine. A country that offers huge long-term potential for the integration and stabilization of European clean energy markets.

Storms make trees take deeper roots, as an old song goes. So, whilst the coronavirus storm will ultimately die down, business, government and the international financial institutions have an opportunity to ensure the renewable energy sector comes out of this crisis with even deeper roots. ■

Delivering Critical Energy Infrastructure

Electricity is fundamental - it is an essential input for healthcare, education, and productivity - and literally powers our economies. Electricity is considered vital to national security and economic stability in every country. Having worked in the electric power industry for more than 20 years, I can tell you that none of us takes this responsibility lightly. The industry plans for adversity, whether it's massive wildfires, cyber-attacks, or weather-related grid outages, and we have always understood that threats are an inevitable part of the cost of doing business. Yet we are currently in a unique situation, fighting a threat that is wreaking havoc on our lives and livelihoods without a predictable endgame in sight. Our thoughts are with everyone who is suffering physically or economically during this difficult time.

Despite this novel threat and the destruction, it has left in its wake, our determination to create a more resilient and secure global energy infrastructure has not wavered.

In fact, if anything, the pandemic has reinforced that determination by illustrating the need for greater electrical system stability, lower costs, and a full-fledged plan to tackle long-term threats like climate change. What is a very bleak situation for many people and businesses has become for us the ultimate challenge not to waver, but to forge ahead and deliver on the promise of technologies that will help ensure that the fundamental right to stable electricity is met, that low-cost energy is available to everyone, and ultimately, that we transform the world to a cleaner, greener and more resilient future.

How do we continue to drive energy transformation during a pandemic?

Below are three steps I believe will help us successfully achieve our goals.

Step 1: Put safety at the core

Safety is necessarily a core principle for all energy companies. Yet not all companies and employees adhere to their own policies, both on job sites and in their daily lives. At Fluence, safety has never just been a set of written protocols. It's a business principle and a core part of our culture that everyone in the company lives day to day - whether on site at a construction project, remote in their home office, or even when going about their daily lives.

When you think about it, safety actually comes down to respect and responsibility – respect for ourselves, our co-workers, our partners and suppliers, and their families and communities, and being fully responsible for our interactions with them. It means that wherever we are and whatever the level of interaction, we care enough about the people we encounter to ensure their well-being by working within all established health and safety guidelines.

In addition to safety protocols related to our energy storage technologies, we have expanded personal and site hygiene protocols as part our response to the coronavirus pandemic to ensure the safety of front-line workers installing this critical infrastructure. We're seeing success at industrial sites throughout the world where social distancing practices, increased use of Personal Protective Equipment (PPE) (and no sharing of PPE between workers), daily temperature testing and screening for exposure risk, and extensive use of hygienic disinfectants are all playing a role in keeping everyone onsite safe and healthy. All construction teams are working in small groups and maintaining proper distancing to prevent the spread of the disease. And, throughout the rest of our business, we enacted home-based work even

John Zahurancik *is the Chief Operating Officer of Fluence*

ahead of local policies in order to protect our team and slow the spread of the disease. This is supported by extensive use of video teleconferencing, personal communications tools, and cloud-based shared tools.

By keeping safety first, we join many other organizations in setting an example of how to continue work through the pandemic while taking active steps to ensure that workers remain safe to deliver energy projects around the world.

Step 2: Remain agile

Transforming the way we power the world is not for the faint at heart, and the ability to adapt to new situations, technologies, regulations, and market players has been critical to our success. It is no mistake that Agility is one of Fluence's four core values.

Over the past month, we've seen this play out daily in the 70 energy storage technology systems we are installing in 13 countries globally. These represent diverse and critical projects that are still moving forward as we work shoulder-to-shoulder with key customers to deliver on commitments that never contemplated a global shutdown. New strategies and tactics for getting onsite work finished are being implemented to ensure that work is completed in the safest and most timely manner.

Fluence teams have had to become even nimbler in adapting to change and finding solutions to mitigate supply chain issues. Nearly every day, our workers and partners around the world are adapting to new infrastructure curtailments and government directives. For instance, one installation required the disinfection of all equipment and delivery trucks as they left the port and before entering an active site.

It is critical that companies maintain flexibility and optionality whenever possible. Unlike vertically integrated companies that try to control every part of the supply chain, Fluence has continued to use an open technology architecture and maintain relationships with a network of highly trusted component suppliers for key pieces of our energy storage technology. This partnering approach helps reduce the risk of relying on a single company or country. This has been tremendously valuable as the coronavirus hit different parts of the world and supply chain at different times. While not all supply chain issues can be completely mitigated (e.g., when a transformer gets stuck at a port that has been closed down), we have found that many issues can be solved with enough flexibility, sufficient time in the project schedule, and an open dialogue with our trusted partners.

Safety is necessarily a core principle for all energy companies. Yet not all companies and employees adhere to their own policies, both on job sites and in their daily lives. At Fluence, safety has never just been a set of written protocols.

These types of scenarios are quickly becoming the new norms of doing business, yet as a company we thrive on being adaptive and continuously improving despite such setbacks. For example, we continue to develop new solutions and capabilities that will allow us to reduce the time needed on site to deploy, commission, and service projects in the future.

Step 3: Build the infrastructure that will power the next 100 years

The onslaught of this global pandemic has forced businesses in every industry to pause, re-evaluate priorities, and determine how we will emerge from this crisis. I firmly believe that we have the ability, the technology, and the will to transform the entire energy sector, which will help create economic opportunities and a more sustainable energy ecosystem.

This pandemic can serve as a call to action, a reminder that we can't rely on outdated and unstable modalities of electricity that, if left unchanged, will inevitably fail to deliver the promises of lower emissions, lower costs, and greater stability. We have a tremendous opportunity to work with the energy sector and governments around the world to leverage the science and data that is already available and forge a new energy infrastructure based on the latest clean technologies that are safer, more secure, and able to withstand future crises.

The power grid that we all grew up with started well over 100 years ago; we are at an inflection point in grid modernization that will revolutionize how we harness and access power for the next 100 years. At Fluence, we not only take this opportunity seriously, we're also 100% committed to deploying energy storage as a central linchpin of the electrical grid framework. A smarter, more flexible grid will create greater electricity resilience and stability during near-term crises, lower the costs of electricity for all, fuel our economies, and drive energy solutions that reduce emissions to steward our scarce resources and preserve our environment. ■

Oil Fall Between Virus and Prices

IMPORTANT LOSSES AND MAJOR IMPACT ON ENERGY DEMAND

The current situation causes serious consequences to human health and also to the economy, having a major impact especially on energy demand. Owners of fossil sources are interested in returning to oil, whose prices, as known, have plunged massively. Not only for technical and economic, overriding reasons - the specialists say, but also for political reasons.

Russia refused to sign a deal with OPEC, an approach that will bring it certain recession. Without a doubt, the price war will bring, sooner or later, important losses, even for those who wanted such war to occur.

Globalization of the current medical situation brings serious, extensive health problems for the population, but, as previously expected, it will cause the same extent of suffering to the economies of the world in terms of energy demand.

We could use a defining example; in China, this unwanted moment has drastically led to a fall of the economy of the country, understanding the ferocity of this economic downturn after the reduction by 20% of carbon dioxide emissions.

The major and less major oil producers understand best that the decline of energy demand started with oil. The International Energy Agency estimates, regarding the base case presented in the Oil Market Report document in mid-March, a decrease by 1.1 million barrels per day compared to the growth forecasts for 2020 which were to reach from 90 million to 100 million barrels per day. Strangely, amid the collapse of oil demand, supply did not decrease at all, continuing production at the same levels. The explanations could be of technical nature. From a commercial point of view, the supply was maintained high as long as the trade margins remained within a sustainable rate; assuming that reserves existed! From an economic point of view, this type of game - demand and supply, is explained by the difference of speed between the decrease in demand compared to oil production relating to the respective supply to the refineries.

The negative impact, we could call it, of the misunderstanding between Russia and OPEC that was based on cutting oil output by 3 million barrels per day, has led to a slump in oil prices difficult to understand, as it was unprecedented. The following days, the economic media would report: "the price war will start from Saudi Arabia in response to Russia's refusal to sign the OPEC deal on the reduction of extracted oil quantities".

Going back in time, to the counter-shock (the oil counter-revolution) from 1986 and 2014, the goals of Saudi Arabia were only to defend its own market share. The fall at the time has infected the shareholding stock exchanges, with an impact on the currencies of producing countries, even on Norway.

Another deep crisis took place during 1926-1927, which affected Royal Dutch Shell and Standard of New Jersey (later Exxon), crisis which has led to the apparition of the cartel at the Scottish Castle Achnacarry (the Achnacarry agreement), Anglo-Persian Oil Company

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

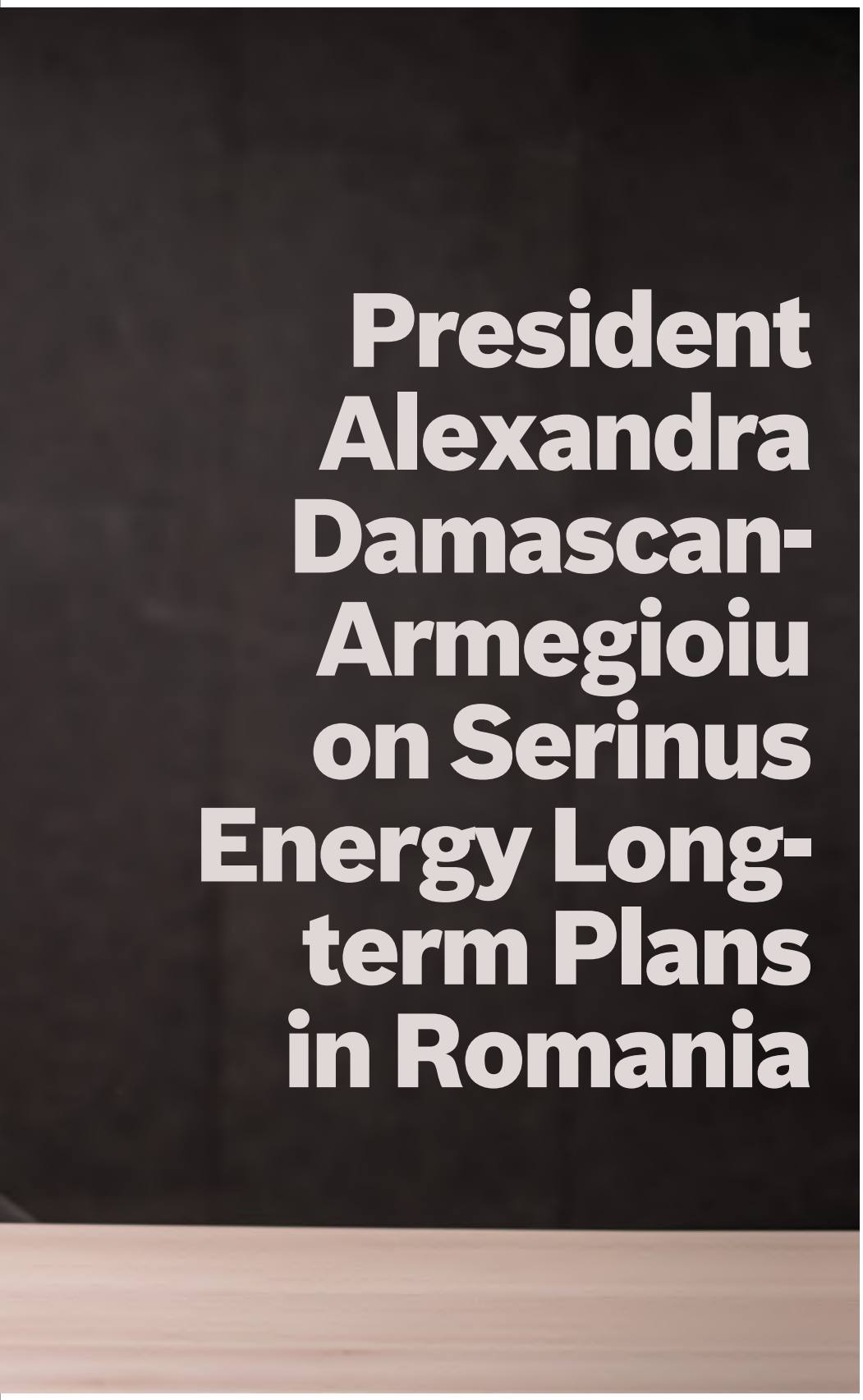
(later BP), Shell, Standard etc. Obviously, the new move has infected the shareholding stock exchanges with a contraction on Wall Street higher than 5% and the currencies of producing countries.

This case will more than likely lead to losses for Russia as well. The proposals made could be a useful food for thought and basis for discussions to combine economic stimuli of producers, but also take into account technological development in the direction of the environment called clean technologies, having time as common denominator. It is possible to save, rebuild, relaunch all economic agents in the production chain, focusing on those industries that can survive in this new global competition, some having to remain and produce in the initial geographical area, potentially becoming even harsher.

The European process must be continued, aggregating most of the technological strengths consistent with the space of the Old Continent, defining points for the implementation of increasingly cleaner industries. However, it is observed that the priorities are changed drastically because the famous unknown of the implicit function, called 'time' is becoming more and more demanding. Time has always been accused of bringing uncertainty, which is becoming increasingly apparent.

The major and less major oil producers understand best that the decline of energy demand started with oil.

From governments is expected the primary effort to prevent any decline, any economic downturn, the return to the forefront of high-tech industrial compartments, so as to bring together specialists whose jobs have been cut as a result of the current crisis; specialists who will seek to support the country's economy, but also families left without support for the same reasons unwanted by anyone!



President Alexandra Damascan-Armegioiu on Serinus Energy Long-term Plans in Romania

by **LAVINIA IANCU**

Photographs by **JUSTIN IANCU**

INTERVIEW / *Alexandra Damascan-Armegioiu*

During the first quarter of 2019, Serinus Energy finalised the construction of the Moftinu gas plant in Romania and brought the Moftinu gas field on production in April 2019. The Group was granted a twelve-month extension on the third exploration phase of the Satu Mare Concession in Romania until 28 October 2020 with the sole commitment to complete a 3D seismic acquisition program. Prior to the year's-end, Serinus completed the permitting required to perform the 148km2 3D seismic acquisition program, which was expected to be completed in Q2 2020. Due to the unprecedented disruptions caused by the COVID-19 outbreak the Group is unable to estimate a completion date at this time. Alexandra Damascan-Armegioiu, President of Serinus Energy Romania, discusses with us about the recent developments of the Moftinu gas project as well as the future steps to achieve the company's objectives in Romania.

1st – Moftinu Gas Plant

2nd - Moftinu Gas Plant Facilities

▼

Dear Mrs. Damascan, you have been with Serinus Energy Romania since 2008 and you have abundant technical and commercial expertise in developing the Moftinu gas project from exploration to production. What are the key challenges of this process?

Looking back, it is hard to believe that when the Company made the decision in early 2017 to proceed with the Moftinu Gas Project, the Serinus Romania Office staff consisted of only myself and my assistant. It was an exciting time with many challenges. We needed to staff up the Romania office with both technical and financial experts, complete the project design, hire an EPC Contractor, procure all the equipment, receive all regulatory approvals, plan for operations, negotiate a gas marketing contract and receive approval to access the Transgaz system. It was a tremendous team effort and I am very proud of what we have accomplished in that short period of time.

How do you manage to overcome these challenges? Is there still any exploration/ development risk?

The most important thing was hiring the right people and empowering them to use their knowledge and expertise to work through all the challenges. Like most projects, it never goes according to plan. You have to be ready to deal with all the challenges as they come and work through the problems and come up with solutions. Risk is inherent in our industry and a Company's success is all about how these risks are managed. The Moftinu Gas Project has been on production for over a year and we now have a very good idea of what

the risks of the project are going forward. Obviously, we want to undertake more exploration in order to find another Moftinu field and all the risks this entails.

What do work commitments include?

Work commitments always are the tools of an Operator who wants to learn more about his Concession Area, understand the sub-surface, explore more the acreage, so that in the end, a sustainable profit can be achieved. Whether it is drilling new wells, work-overs, seismic acquisition programs, reinterpretation of old historical well and seismic lines, commitments have the outcome of allowing the Operator, as well as the Country, to benefit by creating more work, more jobs, revenue and of course more taxes for the Country.

What is the current situation of the Moftinu gas project? What are the wells and facilities on production today? What is the capacity of the Moftinu gas plant?

Moftinu Gas Plant is running on normal parameters, as expected. Our team in Mofinu is doing a fantastic job in running the Plant. We currently have 3 wells producing in the Gas Plant (Moftinu 1003, Moftinu 1004 and Moftinu 1007). The Plant's capacity is 450,000 m3/day, designed to accommodate 6 flowlines.

What trajectory do you see resulting from the start-up of this project in April 2019? What is the estimated production (boe/d) for this gas field?

In Romania, the Company successfully drilled, completed and tested the M-1004 well in February which flowed at 6.0 MMscf/d (approximately 1,000 boe/d). Subsequent to the production tests the well was tied in to the Moftinu Gas Plant and began producing gas into the plant. This well is the third producing well in the Moftinu field and further increases the utilization of the Moftinu Gas Plant. The Company has begun the permitting process for the M-1008 well which is a proposed production well that was anticipated to be drilled late 2020 or early 2021. Drilling plans have been postponed for the duration of the COVID-19 crisis. The Company has permitted a 148 km2 3D seismic acquisition programme in the Berveni area just north of the Moftinu Gas Plant and reached land access agreements with all landowners within the seismic acquisition area. The Company had ordered the mobilization of the seismic equipment and staff to begin the programme, however, due to uncertainty regarding the COVID-19 pandemic and the impacts on travel and services in Romania and the Satu Mare County, the Company and its seismic contractor have postponed the programme. The Company is in discussions with the

Romanian regulatory authorities to agree an extension to the concession area.

In Romania, the Group invested USD 2.1 million (2019 – USD 1.1 million) in the three months ended 31 March 2020 primarily to drill, complete, and tie in the M-1004 well. Romania remained a significant cash flow generating business unit during the period as production increased from the addition of M-1004. The field generated a netback per boe of USD 21.66 for the first quarter. 3.61/mcf

In Romania, the Group is subject to a windfall tax on its natural gas production which is applied to supplemental income once natural gas prices exceed 47.53 RON/Mwh (approximately $3.45 per mcf). This supplemental income is taxed at a rate of 60% between 47.53 RON/Mwh and 85.00 RON/Mwh and at a rate of 80% above 85.00 RON/Mwh. Expenses deductible in the calculation of the windfall tax include royalties and capital expenditures are limited to 30% of the supplemental income. For the three months ended 31 March 2020, the Group incurred windfall taxes of $1.0 million) which equates to USD$6.50 per boe (USD1.08/mcf) of Romanian gas production volumes.

During 2019 Serinus started well site preparations for the M-1004 well in Romania. In February 2020, this well was successfully drilled, completed, and tested at a rate of 6.0 MMscf/d (approximately 1,000 boe/d) from three perforated zones and then brought onto production. What are the next steps?

M-1004 has five gas-bearing zones that appeared on logs: A2 sand; A2.2 sand; A3 sand; B1 sand; and B3 sand. The three deeper zones were completed, being A2 sand, A2.2 sand, and A3 sand. The two shallower zones had gas pay on logs but were not completed. These zones may be exploited later in the life of the well. After completing the perforation and well completion operations, the Company initiated a flow test whereby all three deeper zones were tested comingled. The well testing procedure and results are as follows: • Moftinu-1004 was flowed on a 20/64" choke for 4 hours followed by a 4 hour build up, then flowed on a 32/64" choke for 4 hours followed by a 4 hour build up, then flowed on a 40/64" choke for 4 hours followed by a 4 hour build up, and then lastly flowed on a 36/64" choke for 15 hours; • On the largest choke size (40/64"), the well flowed at an average rate of 6.0 MMscf/d with no progressive pressure decrease throughout the test; • During the final flow period (15 hours) on a reduced choke size (36/64"), the well flowed at 5.5 MMscf/d with no progressive pressure decrease throughout the test.

What's next? Well, I can definitely say we are not stopping here. We have the knowledge, we have the expertise, we have the right people and where is a will there is a way. We always think about the

1st photo – Moftinu Gas Plant - Enclosed Flare System

2nd – Technical discussions about Moftinu Process

3rd – Glycol Dehydration Unit for Processing Natural Gas

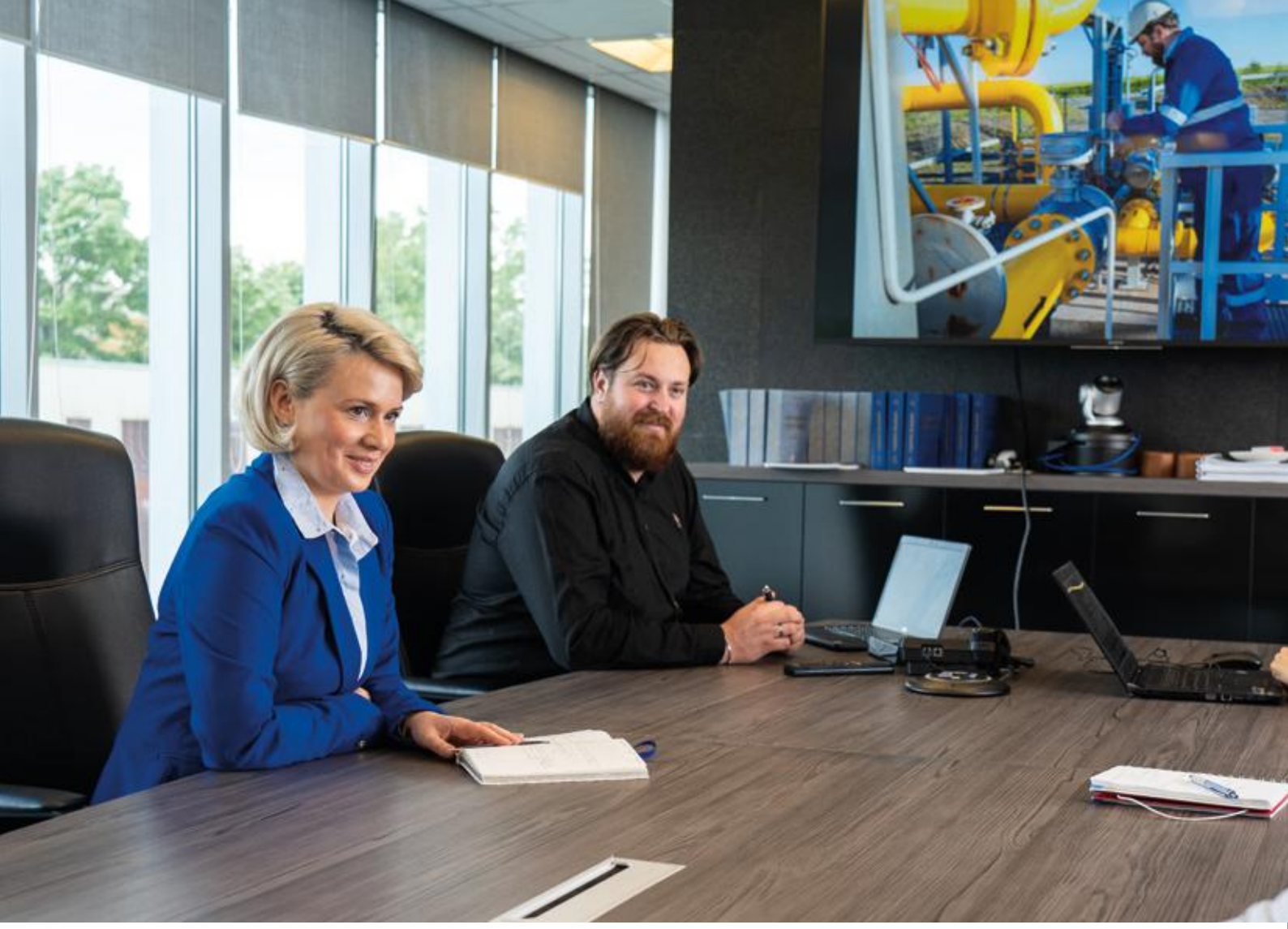
next project. Our CEO, Mr. Jeffrey Auld believes in the prospectivity of the Satu Mare Block, he believes in the citizens and the authorities from Romania. For him, there will always be "what can we do next?"

What is the stage of the 3D seismic acquisition program for the future explorations within the Satu Mare concession?

At the start of March 2020, we were preparing to provide the mobilization order to our seismic acquisition contractor. Unfortunately, the coronavirus pandemic has forced us to put this project on hold until it is possible to bring in the 100 workers to complete the program. We are in constant discussions with NAMR about the program and when it will be safe for us to proceed. Given this, we are very excited to get this project completed. It is the future growth of the Company to develop additional shallow gas discoveries and to bring them onto production.

What prospects to sell domestic gas production do you see? What effects of lower Romanian gas production may we expect?

It is so disappointing to see that Romania still imports gas to meet the country's gas needs. This fact is mostly due to government policies and interventions in the market that have created tremendous uncertainty for producers that increases the risks to investments. For example, the 2019 gas price in Romania was the highest in Europe. A big factor that caused this was the introduction of GEO 14 in December of 2018. The government tried to roll back all the progress that was made in the creation of a viable gas market in Romania. This interference in the functioning of the market created



tremendous uncertainty for producers and consumers alike. I realize that a portion of domestic households may need assistance to cover their heating and electricity costs, but the best role for the government would be to provide direct assistance to these households instead of intervening in the market and creating unnecessary uncertainties for producers beyond the everyday risks we face in delivering gas to Romanian consumers. And as I said, these uncertainties caused the 2019 Romanian gas price to become much higher than prices paid in the rest of Europe. Another ill-conceived government policy is the Windfall tax. This is a very onerous tax on onshore gas producers in Romania. Using Serinus as an example, we only began our production last year and the Windfall tax has taken approximately 22% of our revenue in that time. A windfall tax by definition should allow for the investor to recover all of its investment as well as earning a return on this investment before the government should consider taking a larger share of economic rent. It applies to all gas production ranging from fields that have been producing for decades and have earned back their investment and a return to new gas fields like ours that have only just started producing. We are a Company committed to growing our gas production in Romania. As a small Company currently producing from only one field, we have a high cost of capital making it imperative that we grow our production through our cash flow. The windfall tax takes away money that we would invest in new projects. This would mean more employment, more business for our vendors and over time, more revenue for the government, and increased gas production for the Country's consumers. With this, I would very much like to see the Windfall tax eliminated, or at the very least, it should be redesigned and should not apply to new gas projects.

You have mentioned that the windfall tax has a negative impact on investment with consequences on the development of the gas. Please elaborate your statement.

Yes, indeed it has a negative impact. Both domestic and foreign investments are not encouraged, there is a negative impact on the overall economy of the country, on the stability and predictability of the legislative framework. Overall, the energy security of the country is affected and domestic gas production is at a disadvantage to imports as imports are not subject to the

1st – Moftinu Gas Plant Team ▶

2nd – Moftinu Gas Plant Manifold

windfall tax. There is a strong correlation of the taxation with the recovery of the investment: we are talking here about a complete deduction of the investments made so that the additional taxes (such as windfall tax) are due from the period of total recovery of the investment by the gas producer.

As you are aware the Government of Romanian instituted a windfall profits tax on a permanent basis on 01 April 2018. This tax burden increases significantly as gas prices increase. Whilst we respect the rights of a national government to conduct its fiscal policies in the best interest of the Country, we believe that this tax has the effect of limiting future developments of gas projects in Romania. The tax does not allow businesses that are advancing gas production in the State of Romania to recover its investment prior to having the windfall tax apply. This has the effect of significantly reducing the economic returns available to the project sponsors and in many cases renders prospective gas developments uneconomic. The alteration or elimination of this tax should be undertaken such that companies like Serinus, are able to recover their investments prior to having this tax apply. This tax is also having a very negative impact on the Romanian gas market and will diminish the future potential for growing Romanian onshore gas production. The Company believes that the Satu Mare Concession holds a significant amount of shallow gas deposits in which the Company would like to exploit to grow our business. The alteration or elimination of the tax would provide the Company with a significant amount of free cash flow that would be reinvested in exploring and production activities for the long-term economic and security benefit of the State of Romania and the European Union, create more employment in the oilfield service industry, and encourage production so that Romania is no longer a net importer of natural gas.

I am a proud citizen of Romania and the European Union. In speaking with European Commission on Romania gas, they are very much supportive for Romania to increase gas production as it helps to increase the energy security in eastern Europe. For Romania, we have the goal of joining the Euro zone someday and adopt the Euro as our currency. To do so with the highest benefit to the country, the government needs to institute policies that help industries for which Romania has a competitive advantage and encourage these industries to invest, grow and

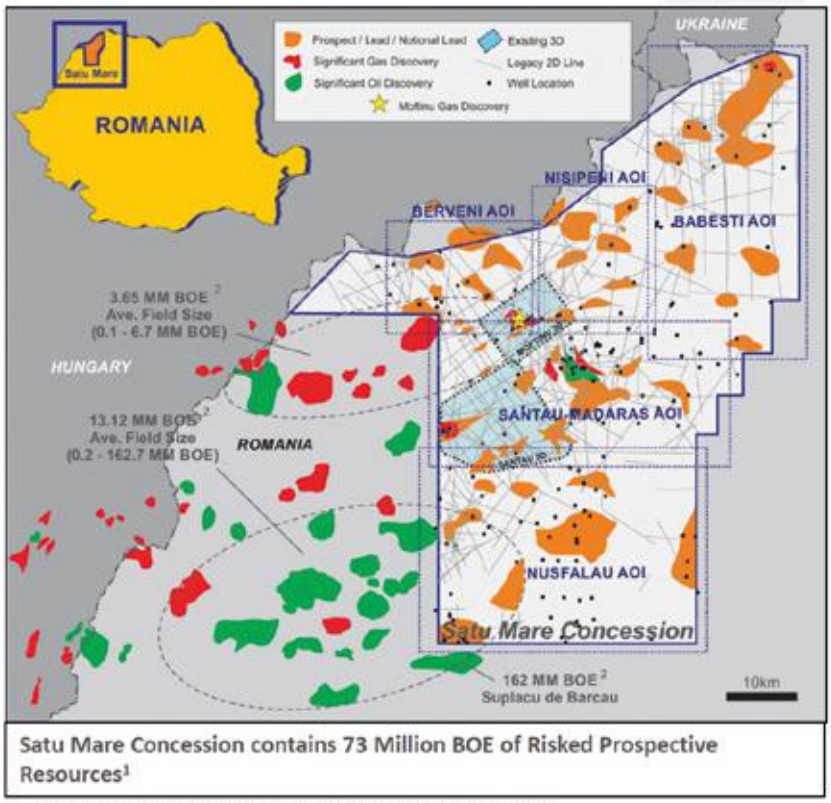
export beyond Romania's borders. Natural gas is one instance of Romanian competitive advantage. Encouraging our competitive industries to grow and export will create significant wealth for the country, improve our balance of payments and strengthen the value of the Lei so that when we are ready to join the Euro zone we do so from a position of strength.

Besides the windfall tax, speaking about the financial constraints, I would like to take this opportunity to highlight our increasing concern regarding the reimbursement of VAT. As you can image, Serinus pays for many of its goods and services in Romania inclusive of VAT. The Company agrees with ANAF, the Romanian tax authority, to schedule a review and audit those VAT payments and ultimately receive a rebate of VAT paid. There are statutory timelines for this process. These timelines have not been honoured by ANAF and the recovery of VAT paid is increasingly being delayed. The current accumulated VAT receivable for Serinus is USD 2.6 million, and it continues to accrue at a significant rate. This has a very real cashflow effect on the business as the VAT rebates continue to accumulate, restricting the Company from having access to that cash to progress the business. The Company has repeatedly requested a time for the VAT audits and have been repeatedly refused even though the statutory limit to schedule such an audit has been exceeded.

What are Serinus Energy's plans in Romania for the upcoming years?

As I have stated above, we are looking to invest our profits to find new gas fields in which we can grow our Company. We are looking into new fields within our Block, where we can drill more wells, new leads to cover with 2D and 3D seismic lines, we are constantly re-interpreting the old well files and re-processing old 2D lines. Serinus Energy Romania wants to grow in Romania and depending

Fig. 1 - Long-term plans for Serinus in Romania



Satu Mare Concession contains 73 Million BOE of Risked Prospective Resources[1]

- **Berveni & Nisipeni AOI (I & II)**
  - Shallow-gas Pliocene prospects
  - Low-risk, Moftinu repeats
- **Santau & Madaras AOI (III & IV)**
  - Re-completions of existing wells within the Moftinu 3D area
  - Deeper (Miocene)
- **Nusfulau AOI (V)**
  - On trend with very large oil fields (e.g., Suplacu de Barcau – 162 MM boe)
- **Babesti AOI (V)**
  - Potentially very large gas discovery

Exploration Campaign Area		Recoverable Resources[1] P90 (MMboe)	P50 (MMboe)	Mean (MMboe)	P10 (MMboe)
I.	Berveni	39	56	59	83
II.	Nisipeni				
III.	Santau	26	47	62	109
IV.	Madaras				
V.	Nusfulau	1	5	22	45
VI.	Babesti	3	17	34	94
Total Unrisked		98	151	**181**	284
Total Risked		44	65	**73**	107

1. Company estimate 2. Field Sizes from Wood Mackenzie Database 2017

on the Berveni prospects identified by the future 3D, we would be drilling additional exploration wells into these prospects. With exploration well success, we can drill Berveni development wells and construct gas plant for new fields.

Are there any additional well locations identified for future drilling? What about new potential shallow gas fields?

From a corporate perspective, here are the long-term plans for Serinus in Romania. (**See Fig 1**)

How does the COVID-19 crisis impact the Moftinu gas project? What follows?

The Company's top priority is the health, safety and wellbeing of all our staff throughout this difficult time. All Group offices are temporarily closed as all staff are working remotely, in line with all local regulations. Operations have not been affected by the outbreak, as the Moftinu field is currently operating as normal. The Company has implemented policies and monitoring such as social distancing to ensure a safe work environment for our staff. The Group continues to monitor each jurisdiction and will implement recommendations and continue to abide by local rules pertaining to all offices.

All capital plans in Romania have been postponed as well as the scheduled maintenance programme at the Moftinu Gas Plant that was set for May 2020. Our teams have designed an incremental maintenance programme considering the postponed gas plant turn-around and does not anticipate this change to have any negative impacts to the safety or performance of the gas plant. The Company had previously announced that it had fully permitted and was preparing to commence a 3D seismic acquisition programme in the Berveni area. This programme has been delayed by the inability to move manpower and equipment during this period. The Company has agreed with its seismic contractor to extend the existing contracts by one year to allow for the future completion of this programme. Subject to the ongoing uncertainty regarding the COVID-19 crisis the Company hopes to recommence this programme in early 2021. The M-1008 production well has been permitted and was expected to be drilled in late 2020 or early 2021, however due to the COVID-19 crisis, it is uncertain when any further work may be completed for the drilling of this well.

DNV GL Report Finds Hydrogen Promising Decarbonization Path for Oil & Gas Sector

- **Half (52%) of senior oil and gas professionals expect hydrogen to be a significant part of the energy mix by 2030, according to a new DNV GL report.**
- **The time is right to begin scaling the hydrogen economy, despite recent oil market shocks. A fifth (21%) of industry leaders say their companies have already entered the hydrogen market.**
- **Greater industry and government collaboration is needed to enable market growth. Immediate focus areas are proving safety, developing infrastructure, scaling carbon capture and storage technology and incentivizing value chains through policy.**

A new report reveals that hydrogen has surged up the priority list of many oil and gas organizations, taking a primary position in the sector's decarbonization efforts.

A fifth (21%) of senior oil and gas industry professionals say their organization is already actively entering the hydrogen market, according to a new report published by DNV GL, the technical advisor to the sector. The proportion intending to invest in the hydrogen economy doubled from 20% to 42% in the year leading up to the Coronavirus-induced oil price crash.

Heading for Hydrogen draws on a survey of more than 1,000 senior oil and gas professionals and in-depth interviews with industry executives. The report suggests that recent shifts in the industry's investment priorities are unlikely to affect the sector's long-term efforts to reduce carbon emissions.

DNV GL found a significant rise in those reporting that their organization is actively adapting to a less carbon-intensive energy mix – up from 44% for 2018 to 60% for 2020. Carbon-free hydrogen production, transmission and distribution is now widely recognized as a central component to the oil and gas industry's decarbonization efforts.

"Hydrogen is in the spotlight as the energy transition moves at pace – and rightly so. But to realize its potential, both governments and industry will need to make bold decisions," said Liv A. Hovem, CEO, DNV GL – Oil & Gas. "The challenge now is not in the ambition, but in changing the timeline: from hydrogen on the horizon, to hydrogen in our homes, businesses, and transport systems."

More than half of respondents to DNV GL's research in Asia-Pacific (56%), the Middle East & North Africa (54%) and Europe (53%) agree that hydrogen will be a significant part of the energy mix within 10 years. North America (40%) and Latin America (37%) are only a little behind.

The success of a hydrogen energy economy is closely aligned with the future of natural gas, renewable energy, and carbon capture and storage (CCS) technology, according to Heading for Hydrogen.

While hydrogen gas produced from renewable energy (green hydrogen) is the industry's ultimate destination, analysis shows that the sector can

only realistically scale up to large volumes and infrastructure with carbon-free hydrogen produced from fossil fuels combined with CCS technology (blue hydrogen).

DNV GL's 2019 Energy Transition Outlook, a forecast of world energy demand and supply, predicts that natural gas will become the world's largest energy source in the mid-2020s, accounting for nearly 30% of the global energy supply in 2050. Natural gas and hydrogen can play similar roles within the global energy system, and the synergies between them – in application and infrastructure – will drive the hydrogen economy.

However, Heading for Hydrogen points to political, economic, and technical complexity in scaling the hydrogen economy.

"To progress to the stage where societies and industry can enjoy the benefits of hydrogen at scale, all stakeholders will need immediate focus on proving safety, enabling infrastructure, scaling carbon capture and storage technology and incentivizing value chains through policy," said Hovem.

DNV GL is involved in projects spanning all four of these enabling factors, including:

- The Hy4Heat programme in the UK, which aims to establish whether it is technically possible, safe, and convenient to replace methane with hydrogen in residential and commercial areas. Tests on three specially constructed houses are proving the safety case for a switch from natural gas to hydrogen in a domestic setting at DNV GL's Spadeadam Testing and Research site – the world's first comprehensive hydrogen testing facility;
- A project run by Dutch gas and power networks operator Stedin demonstrating that zero-carbon hydrogen could help to decarbonize heating in a residential apartment block near Rotterdam, the Netherlands;
- A full-scale demonstration project, initiated by Gassnova, in which DNV GL qualified carbon capture technology developed by Aker Solutions, at Norcem's cement plant in Brevik, Norway. DNV GL qualifies and verifies CCS technology and projects in accordance with DNV GL recommended practices and international standards;
- DNV GL supports governments with technical and market analysis to provide a knowledge base for decisions regarding national strategy and policy measures.

The report is based on DNV GL's survey of more than 1,000 senior oil and gas professionals, undertaken in the fourth quarter of 2019, about their confidence and priorities for the year ahead.

About DNV GL

DNV GL is the independent expert in risk management and quality assurance, operating in more than 100 countries. Through its broad experience and deep expertise DNV GL advances safety and sustainable performance, sets industry benchmarks, and inspires and invents solutions.

Whether assessing a new ship design, optimizing the performance of a wind farm, analyzing sensor data from a gas pipeline or certifying a food company's supply chain, DNV GL enables its customers and their stakeholders to make critical decisions with confidence.

Driven by its purpose, to safeguard life, property, and the environment, DNV GL helps tackle the challenges and global transformations facing its customers and the world today and is a trusted voice for many of the world's most successful and forward-thinking companies. ■

Romgaz Investment Strategy for 2020-2025

INCREASING COMPANY'S SHARE PRICE

"Through our 2020-2025 Development/Investment Strategy, we will greatly focus on natural gas production, on offshore joint ventures (Black Sea) and electricity production and storing, and on diversification activities – petrochemistry and electricity production."
Adrian Volintiru, CEO of Romgaz

Romgaz share price follows an upward trend after the company published its 2020-2025 Development/Investment Strategy estimating an investment schedule of RON 15.69 billion.

"Investments play a decisive role in reducing natural decline of production by both discovery of new hydrocarbon reserves and current recovery rate improvement through rehabilitation, development and upgrading of existing facilities, but also in capitalizing new growth and diversification opportunities. Therefore, the referred investment period will greatly focus on natural gas production (approximately one third of the total amount), on offshore joint ventures (Black Sea) and electricity production and storing (another third of the total amount, i.e. RON 5.475 billion), and on diversification activities – petrochemistry and electricity production – the remaining difference to the total RON 15.69 billion investment schedule over the next 5 years. However, I wish to emphasize that the strategy was developed on the 'business as usual' scenario not taking into account the current COVID 19 pandemic; a review of data is required as soon as macroeconomic forecasts with higher degree of certainty are available," Romgaz CEO, Adrian Volintiru, stated.

Also, in Adrian Volintiru's opinion, investors have understood the ambitious investment program the management has undertaken and the share price increase is a vote of confidence in Romgaz.

In spite the difficult period (a warm winter and COVID 19 pandemic) and the decrease in gas price and revenue, Romgaz managed to reduce expenses by 22% generating for Q1 a profit higher by RON 114 million as compared to the budget. COVID 19 pandemic has significantly shaken up the global economy and has caused a high degree of uncertainty. A return to the initial economic growth rate largely depends on the company's capability to adapt to market requirements and to diversify its services and products.

Considering the above-mentioned aspects, Romgaz plans to be an active, profitable and competitive player on the gas and electricity production market, and to enter new markets such as petrochemical products market. ■

Bulgaria to Set up a State Oil Company

CENTRALIZATION OR PROFIT CENTRES IN THE OIL SECTOR?

by **Daniel Lazar**

Bulgaria plans to set up a state-owned oil company, which will manage the oil and fuel depots and also build filling stations across the country, in order to increase competition and for fair prices for consumers, as the Government in Sofia has announced.

These plans were revealed several days after the Bulgarian Parliament had voted on harshening the tax controls targeting the largest oil company in the country, Lukoil Bulgaria, controlled by the Russian energy group Lukoil. It owns the only refinery in Bulgaria, Neftochim Bourgas, with a capacity of 190,000 barrels per day and having a chain of 220 filling stations. Bulgaria's Finance Minister Vladislav Goranov said the new state-owned oil company would boost competition and domestic fuel prices would reflect faster the declines recorded by the oil price on the global market. "It is not a secret that for years the retail fuel prices are a challenge for our society," Goranov mentioned.

In April, Bulgaria's Competition Council opened a probe into 10 fuel retailers after prosecutors alerted it that retail fuel prices in the country had dropped by an average of only 11% in March, when the global oil price had plunged by about 47%. Despite numerous checks into the Neftochim Bourgas refinery and the leading fuel retailers over the years, Bulgaria's Competition Council has not found any breaches of competition rules. "We do not claim that there is something improper. We want to create more competition and show, by entering this market, the actual price at which, with a minimum mark-up, fuels can be sold in Bulgaria," Goranov added.

According to the proposal of the Government in Sofia, the new state-owned oil company will take over the state fuel depots and allow access to them for smaller fuel distributors. The Bulgarian Finance Minister informed that the state was planning to build several fuel depots and, if needed, it would build up to 100 new filling stations. The first such filling station could be ready within a year.

With closed countries, with people forced to stay at home, with factories whose production was ceased and supplier circuits paralyzed, managers on all continents realized that the phenomenon of globalization, based on consumption and providers of raw materials from other continents, must be redesigned.

In Romania we have witnessed, after 1989, various working methods in the oil sector. The Romanian Oil Company has tried to recentralize several branches of the former entity that operated the oil sector in Romania. Then, after Petrom's privatization, many services were outsourced and the royalty remained the same, all governments that came to power delaying a decision in this regard. We will see what the future will be. Because, isn't it so, the world will never be the same... ■

Conpet to Enter the Solar Energy Market

INVESTMENT OF RON 3MLN IN 5 OWN LOCATIONS

by **Daniel Lazar**

The General Meeting of Shareholders (GMS) of the national operator of the oil transmission network Conpet Ploiesti will debate, on June 12, 2020, the company's Investment Strategy for the period 2020-2025.

"Conpet's strategic directions in the investment field for the period 2020-2025 are the following: upgrading and securing the national transmission system, increasing operational safety, reducing energy consumption, developing new activities related and not related to the core business, monitoring operational programs and priority axes in order to access European funds and other forms of non-reimbursable financing," according to the company's official website.

The Investment Strategy also provides for the development of a photovoltaic park, following an investment of RON 3mln, having as locations the oil pumping stations Poiana Lacului, Cartojani, Barbatesti, Baicoi and Calareti.

The general objective of the project is to increase energy efficiency and supply security - in the context of climate change - by capturing solar energy, in line with the national and European strategies on unlocking the potential of renewable energy. The specific objectives are: developing photovoltaic parks, generating revenue; reducing reliance on imported, fossil primary energy resources and diversifying energy sources; generating environmental benefits by the corresponding reduction of pollution - reducing greenhouse gas emissions and thus combating climate change; technical education by acquiring know-how on RES technologies and creating a nucleus of specialists within the company.

During 2020-2025, Conpet also plans to replace 124 kilometres of oil transmission pipelines (24 kilometres through the work 'Replacement of links for Danube C1-C2 and Borcea arm C3-C4 crossing' and 100 kilometres related to other pipeline replacement works), with a total value estimated at RON 102mln.

Also, for the period 2020-2025, Conpet aims to continue tank construction works, for various capacities, in three locations. The total estimated value for works to rehabilitate and resize the tank farms in this period is RON 21mln.

"Conpet has currently started a program to standardize oil storage tanks. The fact that the old tanks were executed in various construction versions, of various capacities, with different construction solutions, has led to both difficult maintenance and significant operating expenses. Of the around 100 oil tanks existing at Conpet, 75 are more than 40 years old and 77 of the 100 are rivet storage tanks. Repairing the rivet storage tanks is very difficult," according to the project to be submitted to vote in the GMS.

Conpet operates a pipeline network with a length of over 3,800 kilometres throughout Romania, being state-controlled, through the Ministry of Economy, Energy and Business Environment, which owns a 58.71% stake. ■

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

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CDI
OILFIELD SERVICES

Transgaz's Role on the Regional Gas Market

PLANS AND FORECASTS FOR A DECADE

by **Daniel Lazar**

Transgaz, which pays quarterly a royalty of 10% of revenues achieved from domestic and international gas transmission activities, has made public the Plan for the Development of the National Gas Transmission System for the period 2020-2029. The plan is in public debate until May 29 this year, in accordance with the provisions of Directive 2009/73/EC of the European Parliament and of the Council concerning common rules for the internal market in natural gas.

In what follows, we will present some of the plans and forecasts for the following decade, which will have a major influence, both for the domestic market and in regional context.

Regarding gas pipelines and gas transmission connections, out of the 13,430 kilometres in operation by the national transmission operator, about 76% have an effective service life higher than 20 years, close to their normal service life. However, their technical state remains at an appropriate level as a result of the fact that the operating activity is carried out in the context of a maintenance system mainly preventive, planned, corrective and it is supported by annual investment programs for development and upgrade.

The domestic and international gas transmission capacity is ensured through the network of gas pipelines and supply connections with diameters between 50 mm and 1,200 mm. The compression capacity is provided by 5 gas compressor stations, located on the main transmission directions and which have an installed power of around 46 MW, with a maximum compression capacity of 1,180,000 Ncm/h, i.e. 28,320,000 Ncm/day. Two of the 5 compressor stations, GCS Onesti and GCS Silistea, entered an upgrade program, which involves the replacement of the existing compressor aggregates and of the related technological facilities. Until the completion of the upgrade process, the two compressor stations will not be operational.

Out of the 1,233 gas regulating and metering stations (1,233 metering directions), 948 are integrated into an automatic control and monitoring system, SCADA. All these components of the NTS provide the takeover of natural gas from producers/suppliers and its transmission to consumers/distributors or the storage facilities.

Situation of countries in the region

All the information about the gas markets of the neighbouring countries indicate a significant reliance thereof on imported natural gas sources. While until recently for all these countries natural gas of Russian origin represented the only source of supply, currently, by planning and implementing new infrastructure projects the neighbouring countries are seeking their diversification for the obvious purpose of increasing gas supply security and, not least, ensuring price competitiveness.

The focus of the operators of the gas transmission systems in the neighbouring countries on creating new cross-border transmission capacities or the enhancement of the existing ones clearly proves the concern for a significant increase in the degree of interconnection in a part of Europe where there is still a lot to be done for a perfectly integrated market:

• Ukraine has achieved reverse flow with Hungary and implemented the project for ensuring reverse flows with Slovakia; it is important to highlight the interest shown by Ukraine for both physical reverse flow in the

interconnection points with the Romanian system and especially in Isaccea 1 point, thus being able to ensure gas supplies coming from south-east through the Bulgarian transmission system and Line I of international gas transmission;

• Hungary has planned investments for the development of gas transmission capacities in the east and the west of the country, but also pays a special attention to the implementation of a north-south corridor, ensuring the link between Slovakia and Croatia;

• Serbia will benefit from interconnection with Bosnia, Herzegovina, Bulgaria and Romania;

• In turn, Bulgaria takes steps to build the Greece-Bulgaria interconnector and a new interconnection with Turkey, to be able to benefit from gas from the Caspian region and LNG from the LNG terminals in Greece, in order to transport it to the Central-European markets.

Romania has the lowest dependence on imports

In all this picture, Romania is the country with the market least dependent on imported gas. Besides its favourable geostrategic position, if we add the resources discovered in the Black Sea, we reach the conclusion that Romania could obviously play a defining role in the region. In this context, the gas transmission infrastructure becomes the most important factor and Transgaz is currently facing a major challenge: the development - as soon as possible - of gas transmission corridors ensuring both the necessary degree of interconnectivity at European level and a sufficient gas transmission potential for capitalizing on resources on the domestic and regional markets.

Forecast of the electricity mix

The electricity mix, according to the draft Energy Strategy of Romania 2016-2020, towards 2050, is and will remain balanced and diversified. In 2017, the share of primary energy resources in electricity production had the following structure: coal-fired electricity (lignite and hard coal) - 27.5% (17.3 TWh); electricity produced in hydropower plants - 23% (14.4 TWh); electricity produced at the nuclear power plants of Cernavoda - 18.3% (11.5 TWh); electricity produced based on hydrocarbons (oil and gas) - 16.3% (10.7 TWh); electricity produced in wind and photovoltaic power plants - 13.5% (8.5 TWh), electricity produced from biomass - 0.7% (0.4 TWh).

For 2030, the results of modelling in the Best-Case Scenario show an increase by 2.5% in the share of natural gas in electricity production, from 16.3% in 2017 to 18.8% in 2030. Natural gas has an important share in the domestic consumption of primary energy, due to the relatively high availability of domestic resources, low impact on the environment and increased capacity of balancing electricity produced from intermittent renewable sources (wind and solar energy), given the flexibility of gas-fired power plants.

Forecast of energy demand on activity sectors

Romania's gross energy consumption has fallen significantly lately, in 2015 reaching 377 TWh, and final consumption - 254 TWh. The results of modelling, in the draft Energy Strategy of Romania 2019-2030, with an outlook to 2050, estimates the gross energy consumption in 2030 to 394 TWh (increase by 4% compared to 2015). The consumption of energy resources as raw material will increase by 35%, while consumption and losses related to the energy sector will decrease by 4 TWh. According to the draft Energy Strategy of Romania 2019-2030, with an outlook to 2050, gas production will drop, after reaching a new peak of 132TWh in 2025, as a result of production in the Black Sea, to 96TWh in 2030 and 65TWh in 2050. As onshore production is expected to decrease, maintaining a low degree of reliance on imports is conditional upon the development of reserves discovered in the Black Sea.

The Ministry of Environment has submitted to public debate the draft GD approving the temporary use of the land with an area of 2.0083 hectares from the national forestry real estate, by Transgaz, for the project of national importance in the gas sector 'Black Sea Coast - Podisor gas transmission pipeline'.

According to the draft, the temporary use of the forest land with an area of 2.0083 ha is issued for the entire duration of the execution and the existence in the national forestry real estate of the objective 'Black Sea Coast - Podisor gas transmission pipeline'. The forest land is considered temporarily occupied during the execution and existence of the objective in the national forestry real estate. Temporary occupation of the forest land is carried out with the deforestation of forest vegetation, according to the Environmental Permit no. 1/10.05.2018, issued by the National Agency for Environmental Protection.

The investment objectives include: diversification of natural gas supply sources for Romanian consumers; reducing the degree of dependence on gas imports from Russia; transmission to the European markets of Black Sea gas; development of a transmission capacity that will allow in the future the interconnection with the pipelines that will have as potential supply sources the liquefied gas from the Black Sea coast or shale gas.

Upon decommissioning of the objective, Transgaz has the obligation to return the respective forest land in the forest circuit. The pipeline Black Sea Coast - Podisor will connect to the pipeline Ø32" x 63 bar Podisor - Corbu, which is part of the gas transmission corridor Bulgaria-Romania-Hungary-Austria. ■

Bitumen Production in Romania, 'non-existent' or Historic High?

Romanian economy has been seriously affected by the crisis generated by the new coronavirus and works at major infrastructure projects have been put back on the table by authorities. As if we've been leaders in this regard so far. On the contrary. We don't plan to analyse here and now the reasons, but something else has caught our attention in full pandemic: bitumen production in Romania.

by **Daniel Lazar**

The COVID-19 crisis has strongly hit society on all levels, but one of the areas that remained 'standing' was that of roads and highways construction. The construction sites worked, but there were also shortcomings from several points of view.

"The crisis situation will change us significantly in the construction industry as well. In this period, if we talk about shortcomings in construction, related to suppliers, we noticed we no longer have a domestic construction industry. Only during a crisis situation like the current one can we realize that some basic construction materials that we could have produced in Romania we do not produce," said Mariana Ionita, Director of the National Company for Road Infrastructure Administration (CNAIR).

"I realize that many companies activating in the construction materials industry will refocus on other fields. Even the strategy of governments will change, by encouraging the development of domestic production. I will give you an example: bitumen. We are a country that has some or the largest refineries in the area of South-Eastern Europe and we don't have an industry to produce bitumen and we had to sit and wait for loaded trucks to come from Poland, Ukraine or other states. This is not ok," the head of CNAIR said.

According to her, the state could focus more on domestic production and during the crisis period both authorities and constructors realized that project-based work can be carried out. "It is vital for infrastructure to be executed. We realized how good it is in crisis moment to have an

infrastructure allowing you to move fast - especially if we are talking about goods and products," Mariana Ionita also mentioned.

However, we had a record bitumen production in Romania in 2019!

In reply, the officials of Rompetrol, which operates Vega Refinery in Ploiesti, the only bitumen producer in Romania, say bitumen production in 2019 was 120,000 tons, the largest production in history, larger than the previous record reached in 2018, when Vega refinery produced 102,000 tons of bitumen.

Last year's production accounts for approximately 25% of total bitumen consumption in Romania. For the near future, the company considers several investments, bitumen related, and the most important project is that of purchasing a bitumen incinerator, an investment of over USD 3.5mln, as it results from the investment plan of Rompetrol Rafinare for 2020, plan available for the public on www.rompetrol-rafinare.ro

Produced for 13 years!

Rompetrol Rafinare produces, at Vega Ploiesti refinery, a polymerized bitumen, since August 2007. A viscous or semi-solid product resulting from the distillation process of the raw material, bitumen is used primarily for road works, where it acts as a binder for particular aggregates to create asphalt. Rompetrol produces a wide range of bitumen types, with specifications adapted for an equally wide range of applications: from light-duty traffic roads to heavy-duty traffic roads, polymer-enriched bitumen for enhanced elasticity, as well as bitumen for waterproof roofing.

The investment for the modified bitumen plant amounted to over USD 7 million and was achieved with own funding. The equipment has a 60,000 tons/year output capacity and works were carried out by Rominserv, the general contractor of The Rompetrol Group. The original technology conceived by Rompetrol and technical novelties cleared the way for a patent filed with OSIM and held by the company.

The polymer-modified bitumen produced by Vega displays improved elasticity and superior resistance to wear and temperature variations. Moreover, the asphalt layer achieved with the product enjoys a 50% longer lifespan, maintenance costs are cut down by half, resistance to permanent deformation is improved by 85%, and, additionally, it can decrease traffic noise by up to 20%, in line with the solution selected by the constructor.

"The polymer-modified bitumen produced by Vega displays improved elasticity and superior resistance to wear and temperature variations. Moreover, the asphalt layer achieved with the product enjoys a 50% longer lifespan, maintenance costs are cut down by half, resistance to permanent deformation is improved by 85%, and, additionally, it can decrease traffic noise by up to 20%, in line with the solution selected by the constructor"
Alexey Golovin, KMG International

Also, regarding bitumen, in 2017, Alexey Golovin, CO Legal and Corporate Affairs within KMG International, said: "we are analysing this project and increasing bitumen production capacity could be submitted for debate". This idea was resumed last year, at the anniversary of the 40 years of Petromidia.

Instead of conclusion

Therefore, is it a lack of information or training of the CNAIR director who said bitumen was no longer produced in Romania, or was it intended to be a well-sounding headline in the media? Neither is good for the real situation in the field. ■

Declining Turnovers for Prahova-based Oil & Gas Companies

The Covid-19 crisis has caused, in Prahova County, considered the county of 'black gold' in Romania, more than half of the companies to register a fall in turnover during the state of emergency, according to an analysis conducted by Prahova Chamber of Commerce and Industry (CCIPH). Of all the respondent companies, 17% are in the energy sector – oil & gas, 77% being in the industries sector and 23% in the sector of specialized services.

by **Daniel Lazar**

CCIPH analysis was conducted during April 23-29 based on a questionnaire made available to Prahova-based companies, respondents coming from the 7 representative areas of activity of the economy of the county - Industry (53%), Services (22.5%), Trade (10.3%), Construction (6.1%), Agriculture (4%), Tourism (2%) and Research-Development-High Tech (2%).

One of the conclusions is that in the areas of Industry, Services, Construction and Agriculture small and medium-sized companies are predominant, and in the areas of Trade, Tourism and Research - Development- High Tech the micro-enterprises and small companies are predominant. In the industrial field, where the number of employees is higher than in Services and Trade, staff reduction measures were adopted at a larger scale (61.5%) - by sending into technical unemployment or layoffs, 3.8% sending the entire staff into technical unemployment. In industry, in terms of export, for 87.5% of the companies the activity was affected at a rate of 10%-100% and 77.8% of the import activity was affected at 34.6% of the respondent companies in this field that make imports. Of total respondent companies, the perception was the following: 57.7% - moderately affected companies; 15.3% - very affected; 7.7% - the activity was stopped; 3.8% - not affected.

The main effects felt by companies in the industrial sector, from the onset of the state of emergency, were: difficulties with receipts - 61.5%; decrease in turnover and affected cash flow - 42.3%; delays in supply - 53.8%; technical unemployment - 42.3%; delays in paying suppliers - 42.3%; partial suspension of activity and layoffs - 19.2%; total suspension of activity - 11.5%.

How is the crisis seen in the oil & gas sector?

In the oil & gas sector, in terms of age of the respondent companies, 84.6% are more than 10 years old and 15.4% are 5-10 years old. Of the respondent companies, 15.4% are very large (over 1,000 employees); 7.7% are large (250-1,000 employees); 23% are middle-sized (50-250 employees) and 53.8% are small (10-50 employees).

In terms of turnover during the COVID-19 crisis, 31% of the companies did not register a decline in this indicator, and 69% recorded declines of 15%-78%.

Other two analysed indicators were sending the employees into technical unemployment: 38.5%

YES; 61.5% NO and layoffs: 15.4% YES; 84.6% NO.

Among the surveyed companies, 61.5% make exports and among these, half are negatively affected, meaning that export fell by 10%-60%.

Moreover, the companies were affected by the COVID-19 crisis at the following rates: very affected -7.7%; moderately affected - 79.9%; little affected - 13.4%.

Among the most important reasons for concern of companies in the energy/oil & gas sectors the following were mentioned: recession after COVID-19 - 76.9%; financial impact - liquid assets and capital resources - 61.5%; difficulties in supply - 46.15%; layoffs - 38.5%.

Reasons for concern regarding the impact of COVID-19 crisis on companies

As all the respondent companies mentioned two, three or four reasons for concern regarding the current situation, the resulting rates show this situation cumulatively.

The main measures to be applied by the state required for companies in this economic context include: financing of SMEs with 0 interest rate, after the state of emergency ceases; refinancing or extending maturities for loans; supporting active companies by exempting them from the payment of social security contributions.

Among the surveyed companies, 92.3% agreed with granting non-reimbursable funds, and 7.7% did not agree with this measure.

The estimated duration for feeling the effects of the crisis was: 3-6 months - 7.7%; 7-12 months - 46.15%; over 1 year - 46.15%. As estimated term for the occurrence of problems: 1 month - 30.8%; 2 months - 15.4%; 3 months - 46.15%; not expecting any problem: 7.7%.

Relating to the conversion of activity, 46.15% of the respondent companies said there was no question of adopting such measure, and 53.85% said that, in principle, they targeted an adaptation of the activity, but were still analysing the situation.

Post Covid-19 and the Hydrogen Sector

Following the unprecedented Covid-19 outbreak currently unfolding, Hydrogen Europe published its latest paper: 'Post Covid-19 and the Hydrogen Sector - A Hydrogen Europe Analysis'. The study outlines the need for and rationale behind rapid action as a result of the Covid-19 impact.

The clean hydrogen sector has finally reached the pre-commercialisation phase and is ready to play its essential role in decarbonising our economies. Clean hydrogen is a perfect partner to the European Green Deal, enabling the realisation of its climate, environmental and economic development goals.

The economic crisis following the Covid-19 pandemic may cause a significant delay to the adoption and commercial roll-out of clean hydrogen. It may even permanently endanger the capacity of the clean hydrogen sector to take-up its role as the missing link in the energy transition.

As a result, the clean hydrogen sector faces three major risks:

- In the short term, small, innovative companies which form the backbone of the technology providers are likely to suffer a major shortage of liquidity due to a steep drop in revenues which will result in staff cuts or even bankruptcy;
- Believing that climate and environmental policy commitments will take a backseat in economic recovery plans in Europe and elsewhere large companies which were planning major investments in clean technology are likely to abandon or severely scale-down these plans;
- Investors may, for the reasons as presented above, be less inclined to finance the planned growth of the sector.

A swift, decisive and coordinated action is necessary to address the risks and, at least, dampen the negative impact that they may have on the deployment of clean hydrogen technologies and on our transition to a net carbon, yet powerful and wealthy economy.

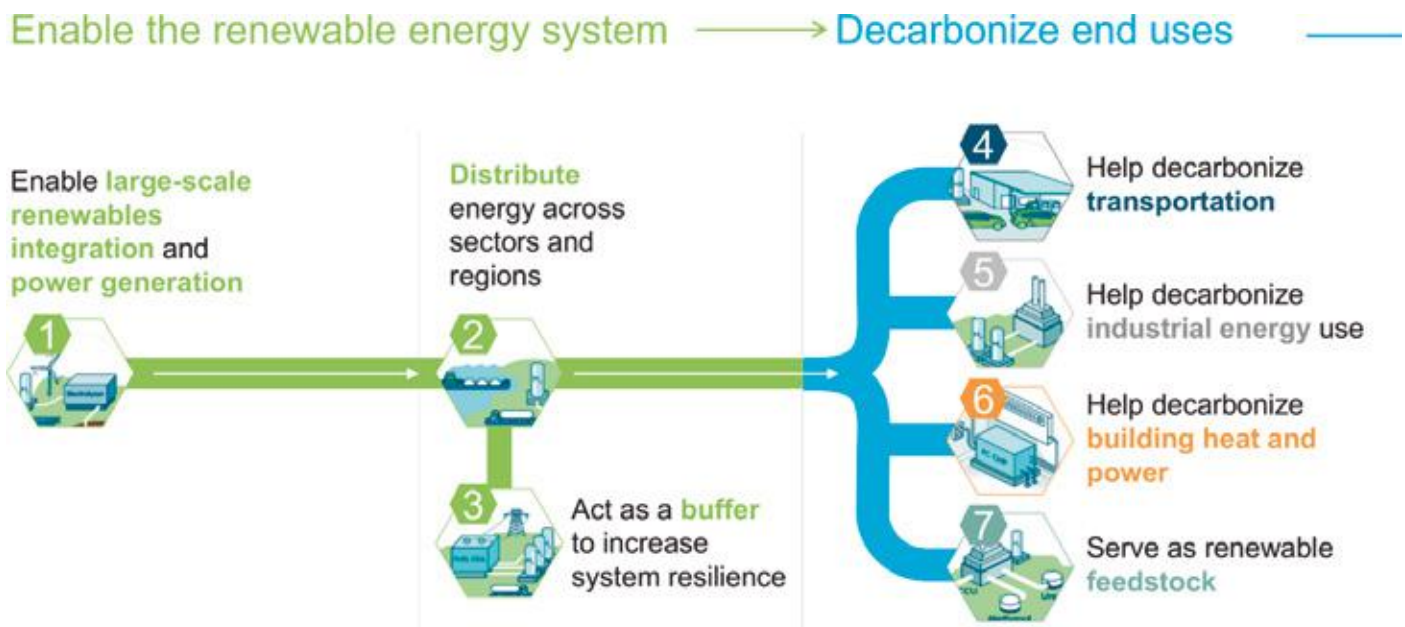
To stave off the risks presented above, Hydrogen Europe calls upon the European Commission and all other relevant policy actors to take the following support actions:

1. Provide clear and immediate signals that, despite the current crisis, the European climate and environmental objectives will be maintained and even raised. In addition, provide clear policy support signals for the hydrogen industry. The impact of this cannot be overstated and its cost is low.
2. Link bailouts/financial support provided in the sectors of energy, transport, energy intensive industries and heating and cooling to strong commitments in terms of decarbonisation in the short and medium term (5-10 years).
3. Directly support the hydrogen value chain by compensating for short term revenue loss in value of EUR 450-500 million.
4. Provide certainty on the continuation of the European research and innovation partnership on clean hydrogen with increased budget and scope.
5. Immediately unlock first commercial markets for green hydrogen through market incentives (e.g. increase renewable energy share quotas in the Renewable Energy Directive (RED II), implement quota for clean/green aviation fuels, etc.), regulation (e.g. enable green power supply through grids) and public funding (e.g. ETS Innovation Fund, Important Projects of Common European Interest (IPCEI), Carbon Contracts for Difference, etc.).

According to Hydrogen Europe, these support actions would help protect thousands of highly skilled jobs and will enable to retain the planned portfolio of investment projects, which have been estimated to be at least EUR 15 billion and as high as EUR 130 billion by 2030.

Is there a need to take action?

At the end of this crisis, companies will look at their results. They will be very bad. It is already clear that many companies will emerge from the crisis with significantly worse balance sheets – with lower assets and high debt levels. As a consequence, they will have to tighten their spending, even when the



Hydrogen as enabler of the energy transition in Europe.
Source: Hydrogen Council

health crisis is over.

Everything which is not essential for their short-term profitability and core business will be on top of the cuts list. Even if they would like to act differently, company CEOs will not be able to escape that logic due to shareholders pressure.

Unless public authorities are able and willing to convince them to act differently by providing support only on the condition that certain climate/future oriented investments are maintained (i.e. a huge climate targeted recovery plan). Similarly, investors are also already fleeing from any risky assets to the safety of cash, gold and other safe assets which is driving the share market down. As a consequence, long term investors, including pension funds, facing big reduction of their asset valuations will be reluctant to invest in risky projects and risky SMEs.

Furthermore, fears of a global economic recession have brought oil and gas prices to their lowest levels in the last two decades. As the economic fallout of Covid-19 could reduce the world's oil demand growth for the year ahead, it is feasible that the oil and gas prices will not rapidly recover, further undermining competitiveness of green investments.

The first signs of this happening are already there with Bloomberg NEF cutting its predicted growth in new solar installations by 8%, which would mean a decrease in new additions for the first time since the 1980s, with wind also facing a considerable downside risk.

Another key issue is that 70% of the world's clean energy investments are still government-driven, either through direct government finance or in response to policies such as subsidies or taxes. With such low oil and gas prices, the importance of government's role in the energy transition is only going to increase.

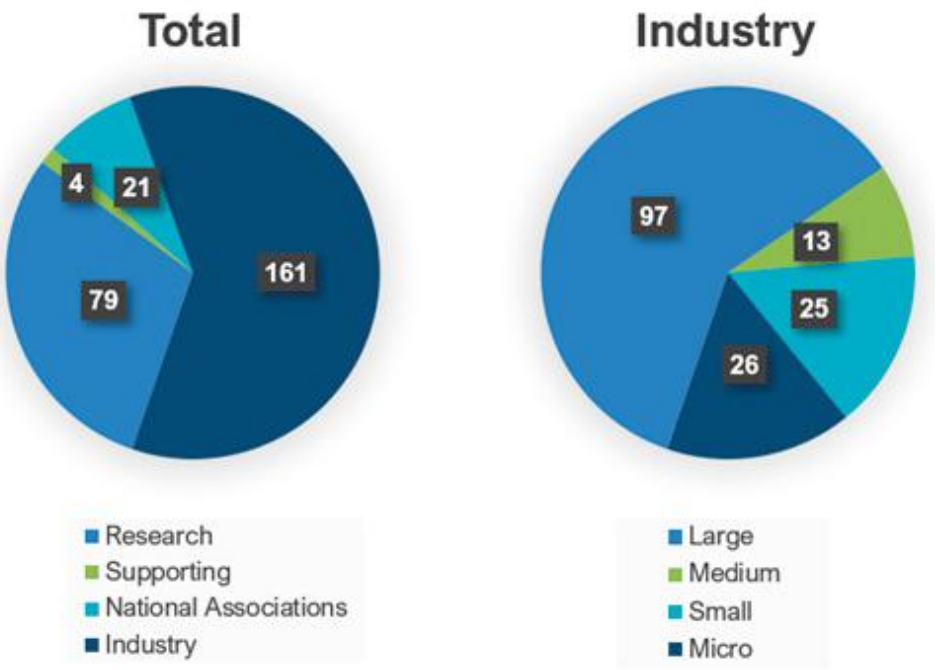
Yet, with the economic fallout from the Covid-19 pandemic already predicted to be much more severe as that of the global financial crisis, with energy demand contracting by 6% in 2020, the largest in 70 years in percentage terms and the largest ever in absolute terms, the impact of Covid-19 on the energy demand in 2020 would be more than seven times larger than the impact of the 2008 financial crisis on global energy demand.

Governments worldwide will face an immediate challenge of kick-starting their national economies. As recently announced recovery plans show, the value of fiscal measures undertaken by EU countries varies from 1-2% up to 12% of GDP, with Germany committing up to EUR 156 billion of fiscal measures and a further stabilisation fund worth EUR 600 billion. When combined with a loss of tax revenues, this will substantially increase the level of public deficit and will almost certainly reduce funding and investments in climate change mitigation and adaptation.

The worst risk is associated with the temptation to abandon climate objectives all together: already the Czech Prime Minister has called for the European Green Deal to be scrapped and a Polish Deputy Minister of State Assets has demanded the

In total Hydrogen Europe represents:

- 161 industry companies representing the whole value chain, including OEMs and end-users,
- 79 research organisations,
- 21 national associations,
- 4 supporting companies.



Breakdown of Hydrogen Europe members (including Hydrogen Europe Research) as per March 2020. Source: Hydrogen Europe

EU ETS to be abolished from 2021.

Taking all of the above into consideration, it is clear that, if no decisive action is taken, renewable energy and clean technologies industries – with low carbon hydrogen among them – face a considerable downturn risk.

Why should action be taken?

While it's understandable that in the short term, the measures aimed at fighting the Covid-19 pandemic should take priority, followed up with a focus on propping up the economy, we should not forget that, long term, the climate crisis is still the biggest challenge, and it will still have to be tackled. The International Energy Agency (IEA) estimates that, although global CO2 emissions are expected to decline by 8% in 2020, the rebound in emissions may be larger than the decline, unless the wave of investment to restart the economy is dedicated to a cleaner and more resilient energy infrastructure.

With that in mind, it should be noted that the energy transition in the EU will require hydrogen at large scale. Without it, the EU would miss its decarbonization objectives. Hydrogen represents a versatile, clean, and flexible energy vector.

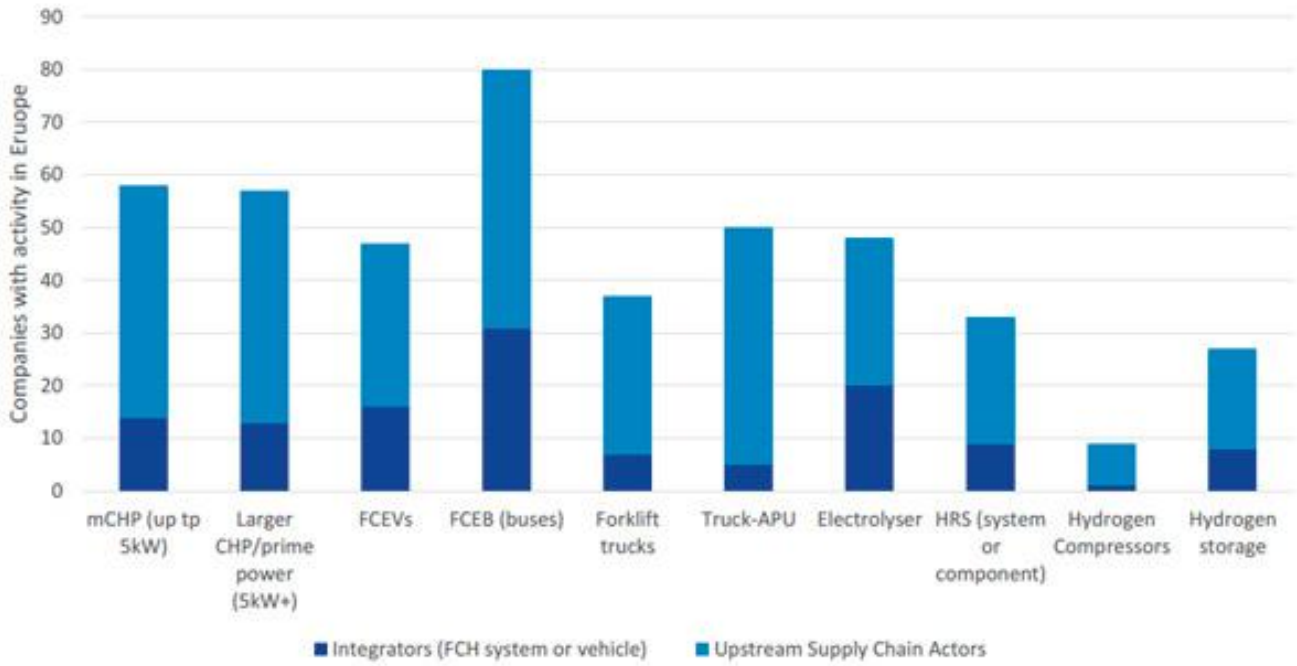
Hydrogen is not simply a potential contributor to solving the challenges posed by the energy system transition, offering a future solution with a number of advantages, particularly when used in fuel cells but it is a solution without which Europe cannot achieve its 2050 goals on greenhouse gases (GHG) emissions reduction.

The decarbonization of the gas grid that connects Europe's industry and delivers more than 40% of heating in EU households and 15% of EU power generation requires hydrogen.

In transport, hydrogen and hydrogen made fuels are the most promising decarbonization options for aviation, ships, trains, trucks, buses, large cars, and commercial vehicles, where the lower energy density (hence lower range), weight, high initial costs, and slow recharging performance of batteries are major disadvantages.

Hydrogen is the best (or only) choice for at-scale decarbonization of selected segments in transport, industry, and buildings. Specifically:

- The decarbonization of the gas grid that connects Europe's industry and delivers more than 40% of heating in EU households and 15% of EU



Integrators and supply chain actors across applications (4). Source: [12].

power generation requires hydrogen.

• In transport, hydrogen and hydrogen made fuels are the most promising decarbonization options for aviation, ships, trains, trucks, buses, large cars, and commercial vehicles, where the lower energy density (hence lower range), weight, high initial costs, and slow recharging performance of batteries are major disadvantages.

• Industry can use hydrogen to produce high-grade heat, it can use it directly as a chemical feedstock (for example, in steelmaking, substituting coal-based blast furnaces; ammonia production; hydrotreating in refineries in chemical processes and others) or use it as synthetic methane in order to decrease hard to abate CO2 processes (e.g. in the production of cement).

The potential for hydrogen to essentially replace fossil-based energy while at the same time create jobs and increase long term EU industry global competitiveness, has been recognised by identifying hydrogen technologies and systems as one of several strategic value chains for a future-ready EU industry. None of this will change because of the Covid-19 pandemic.

Furthermore, although the hydrogen sector is still in its early stage of development – it is growing fast. While the current clean hydrogen technology market is not worth more than EUR 2 billion at the moment, our analysis shows that EUR 15 billion of investments that have been planned by the sector in the near term may be in jeopardy.

Over longer term, Hydrogen Europe estimates that there are currently almost 70 projects at varied stage of development that would be at risk if no action is taken.

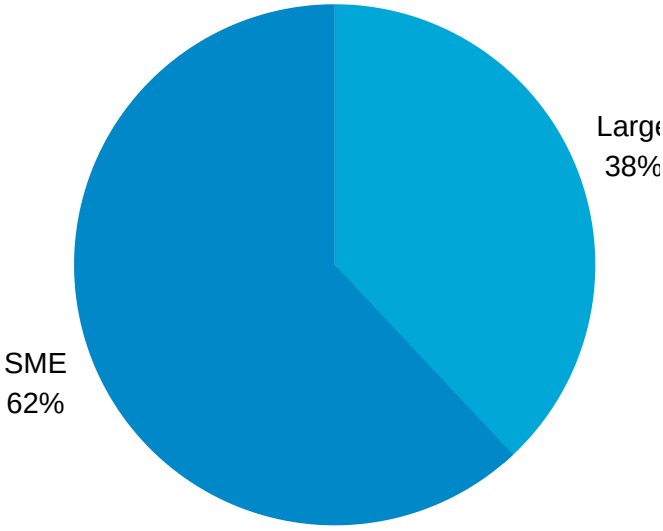
The total electrolyser capacity planned for installation in those projects is over 22 GW (equivalent of 15 to 20 nuclear reactors). If these projects do not go through, it would equal to a loss of revenues for the EU electrolyser manufacturers of over EUR 13 billion over the next 10 years (taking into account only the end product and dismissing indirect revenues along the supply chain). Considering all additional investments in hydrogen transport, distribution and storage, refuelling stations, vehicles, pipelines, etc. the total value of planned projects that may be affected by the crisis is around EUR 120-130 billion.

What can be done?

As soon as the immediate health crisis caused by the Covid-19 pandemic will subside, the attention should move to ensure that the EU economies are growing again. Yet, only returning to the status quo is not the way forward. We should learn from the 2008 global financial crisis and make sure that clean hydrogen, clean energy, clean transport and smart infrastructure are a central part of any stimulus program. The policies and instruments deployed should ensure that the recovery is durable, i.e. the growth stimulated should be sustainable. Failure to do so might lead only to a temporary recovery

TOP-DOWN APPROACH

The following results are based on 127 replies received from the companies active in the hydrogen sector (79 of which, i.e. 60% were SME's), representative for the whole value chain.



Breakdown of respondents by size of the company.
Source: Hydrogen Europe survey results

in industries that are unsustainable in the long term. This implies integrating long term concerns even in any short-term policy packages.

The immediate actions can include:

- Compensate companies for coronavirus impact (cover salaries while re-skilling, production disruptions, etc.) with special consideration of more vulnerable SMEs.
- Re-orientate manufacturing (investments for competitiveness and up-scaling).
- Strategic 'investment' (any kind of financing, loans, guarantees, and even equity) to ensure EU's capacities along the hydrogen value chain.
- Protect and support the owners/investors against financial distress, and ensure integrity of the EU value chains.

One other immediate action, whose impact cannot be overstated, and one which is cost-free, is an urgent and clear confirmation of the EU's commitment to its climate goals and to the green deal, accompanied by continued and clear policy support signals for the hydrogen industry. This is essential to support investor confidence.

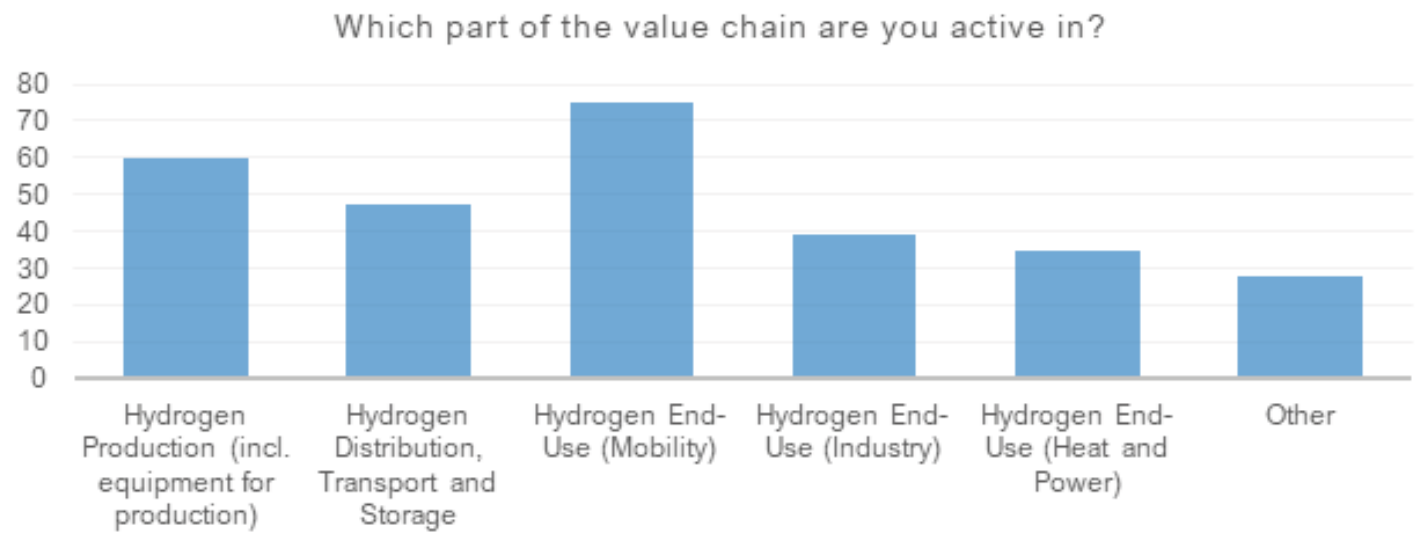
Over medium term, the actions should also include stronger support for R&D in clean technologies - historically R&D investments in the private sector move in parallel to the GDP growth, hence in times of economic downturn it is crucial for increased public funding to cover the gap and ensure at least continuity in strategic research programmes.

In similar ways to investment in high speed broadband communication networks being part of the economic stimulus packages after previous economic crisis, this time a similar place should be reserved for alternative fuels infrastructure and clean energy systems, accompanied by regulatory frameworks which support open access and competition.

At the same time, with onshore wind and solar power already being cost competitive with fossil fuels (and getting cheaper still), addressing the structural and regulatory issues that are preventing increased renewable energy penetration into grids is more likely to bring about a far greater positive long-term effect.

Investments in energy storage, interconnections as well as accelerating the decarbonisation of heating, transport and industry should be prioritised over direct support of renewable energy projects. Although, having said that, extending existing tax breaks or support mechanisms for renewables is still advisable.

Furthermore, it should be restated that misplacing government subsidies to unsustainable business models may undermine the long-term sustainable growth capacity of the European economy. Even if they would provide short term demand stimulus, they can have a negative effect by postponing needed technology restructuring or fuel switch - thus wasting taxpayer funds in the long run and delaying significantly our fight against climate change. Hence, any bailouts that go to airlines, shipping companies,



BREAKDOWN OF RESPONDENTS BY VALUE CHAIN (5).
SOURCE: HYDROGEN EUROPE SURVEY RESULTS.

power, oil and gas or energy intensive industries, should be handed out only on the condition of the public funds recipients agreeing to meeting ambitious decarbonisation goals within the next 5 to 10 years.

There are a number of measures that can be taken without a need for additional direct public spending, including:

- Removing fossil fuel subsidies and tax breaks, thus reducing the funding gap of clean hydrogen projects (and other clean energy projects as well), which is still mostly directly related to the difference versus the fossil fuel benchmark solution.
- Removing unnecessary regulatory barriers and requirements, like proving the additional character of renewable electricity imposed in the RED II.

Relying on existing market-based instruments, i.e. Power Purchase Agreements (PPAs) combined with Guarantees of Origin (GO) for electricity would not only reflect market reality but would help facilitate a number of green hydrogen investment projects.

Both of those measures, while not directly providing any additional funding to companies active in the sector, will go a long way of ensuring the projects that are planned are actually carried out and not put on hold, or cancelled altogether.

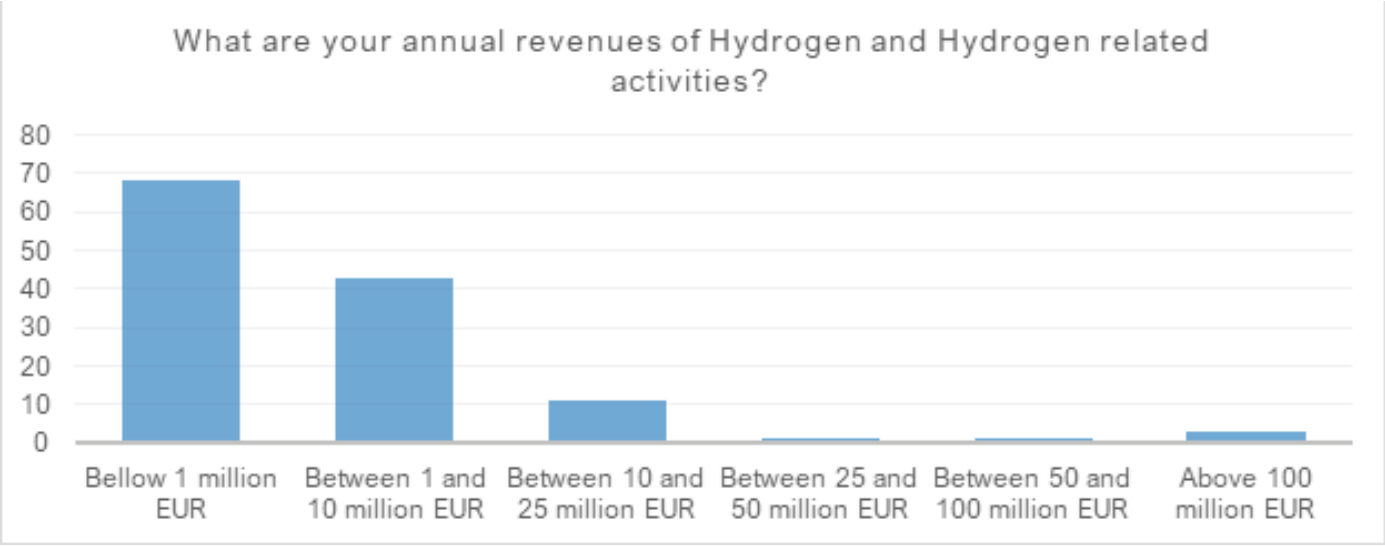
Who should be supported?

The hydrogen sector can be split into two groups of companies:

1) SMEs focussed on the hydrogen sector, most as technology providers, some as project developers. These companies usually do not make profit and do not have (yet) a regular business, but they hold a great innovation potential, usually ahead of the game worldwide. They mostly live from the prospect of making money in the future (their current/future/stock value is very much dependent on the vision of the future). Hence their survival is very dependent on:

- The decision of large companies in transport, industry and energy sectors to actually launch and carry out the decarbonisation projects they have announced or planned.
- The willingness of their shareholders to continue bringing equity and let them 'burn' cash with the hope of a return in the future.
- The willingness of governments to move forward fast with the policies that will make the hydrogen business viable and inject a level of certainty in their business model and future cash flows projections, therefore reducing risk and easing access capital, including debt.

In the very short term, they may face serious cash flow (liquidity) issues that may lead to bankruptcy. In addition, a number of them are in the middle of very large investments to increase their capacity of production. These investments are usually carried out in phases and, if investors panic (in the absence of strong governmental signals), they may be tempted to stop them.



BREAKDOWN OF RESPONDENTS BY ANNUAL REVENUES FROM BUSINESS ACTIVITY IN THE HYDROGEN SECTOR. SOURCE: HYDROGEN EUROPE SURVEY RESULTS.

2) Large companies that will trigger the large deployment in the hydrogen sector, e.g. the big energy companies, the big industry companies, the transport industry. Dozens (if not hundred) projects have been announced but not yet decided. These projects are normally (1) not profitable and (2) a preparation for longer term business cases when policies will be there and costs lower.

First, the companies are likely to cut everything which is not essential for their immediate profitability and, clearly, projects for which no final investment decision was made (all hydrogen projects basically) will be the easiest to cut, reinforcing the need of a recovery plan to escape this logic.

Second, companies will perceive a higher uncertainty about the arrival or not of tougher climate policies. Hence, the need for governments to give them a strong indication that these policies will come and rather sooner.

The situation is slightly different for some transport OEM and for equipment providers that develop hydrogen equipment in addition to a large existing business (e.g. Plastic Omnium, Bosch, etc). They are not developing 'projects' with a high visibility like the energy/ industry companies. They rather have internal decisions to develop new products (new tank, new test bench, new vehicle models) which are often less visible.

Although the whole hydrogen value chain (including potential users of clean hydrogen) is represented within the membership of Hydrogen Europe, obviously not all European companies active in the sector are also members of the association. In reality, the upstream sector contains a disproportionately large number of SMEs.

A recent European hydrogen and fuel cell supply chain analysis report, identifies a total of 445 actors, of which 246 are research organisations. Out of the 189 industrial actors, the majority (112) are upstream supply chain actors. There are 68 fuel cell and hydrogen system integrators (e.g. fuel cell system, electrolyser system, hydrogen storage system, HRS) and 27 vehicle integrators.

In total Hydrogen Europe estimates that there are at the very least around 280 companies actively developing hydrogen technologies in the Europe currently, out of which around 170 are SMEs. Together the SMEs dedicated to hydrogen and the hydrogen departments of the companies with a broader scope employ around 16.000 people at the moment (with a significant growth potential).

When it comes to taking actions aiming to overcome the negative economic impact of the COVID-19 pandemic, Hydrogen Europe's position is that the above-mentioned actions should cover the whole value chain.

How much will it cost?

The following estimations have been based on the assumption that the total value of financial support will be gauged in a way as to cover the negative impact of the Covid-19 pandemic – without considering any additional funding, that would be needed to scale-up manufacturing capacity etc.

The estimation has been based on an assessment of the value of lost revenues by industrial actors active in the hydrogen sector. The lost revenues have been estimated using two independent approaches:

- A top-down approach – based on a survey conducted among companies active in the hydrogen sector, during the week of 30.03.2020 – 03.04.2020.
- Bottom-up approach – based on an estimated negative impact, that the economic slowdown will have, on the revenues of companies active in the hydrogen sector. Calculated to be 30% of the value of the 2020 hydrogen market in the EU (considering only technology manufacturing and excluding the sales of hydrogen itself).

On average, without any economic measures being taken, revenues are set to decrease by 50% in 2020, disproportionately affecting SMEs (decrease of 55%) vs 42% decrease for large companies.

Extrapolating the survey results to the whole sector, of estimated 280 companies, the total financial support needed to preserve the workplaces in the hydrogen sector is around EUR 450 million.

Based on experience from previous years and given the current state of the market development, the most conservative estimation made by Hydrogen Europe shows, that, in normal circumstances the total end products market value in 2020 would amount to at least EUR 650 million.

Taking into account the expected duration of the lockdowns in European countries and related slowdown of economic activity, as well as seeing that on average the valuation of stocks of companies active in the hydrogen sector fell by more than 30%, a short-term measure aimed at alleviating the negative impact resulting from the Covid-19 pandemic, should cover at least 25-35% of estimated annual revenues of the sector, i.e. EUR 375-525 million.

It should be also noted that the support plan should be treated as investment rather than cost. As has been demonstrated over the years by the Fuel Cell and Hydrogen Joint Undertaking (FCH JU), the hydrogen sector is willing to follow-up the initial support with its own investments in the field and create EU added value.

Under Horizon 2020 rules, the FCH JU was required to demonstrate a leverage effect of 0.57. This requirement was significantly over-achieved. By the end of 2018, the leverage effect from Hydrogen Europe members alone had reached EUR 1.36. Furthermore certified, reported and planned additional activities over 2014 – 2020 total an amount of EUR 1.218 billion. This means that, taking into account in-kind contributions of private partners, the total leverage effect (in projects and in additional activities) is 2.67.

In other words, for every euro of EU contribution for all signed Horizon 2020 FCH JU grant agreements, private partners (members of Hydrogen Europe and Hydrogen Europe Research) will have committed to spend EUR 2.67 either on FCH JU projects or on additional activities.

About Hydrogen Europe

Hydrogen Europe represents the European Hydrogen and Fuel Cell sector, including 160+ industry companies representing the whole value chain, including OEMs and end-users, 78 research organisations and 21 national associations. It brings together diverse industry players, large companies and SMEs, who support the delivery of hydrogen and fuel cells technologies. Hydrogen Europe does this to enable the adoption of an abundant and reliable energy which efficiently fuels Europe's low carbon economy. Hydrogen Europe partners with the European Commission in the innovation programme Fuel Cells and Hydrogen Joint Undertaking. ■

Reversing the Damage from Covid-19

WORLD'S BIGGEST GREEN RECOVERY SPENDING PROGRAM

The European Parliament passed a resolution urging the EU's authorities to put citizens at the heart of the revival strategy after the devastation from the coronavirus. MEPs overwhelmingly insist the upcoming budget must be in line with the European Green Deal. Ahead of the vote, more than 1.2 million people signed an environmentalist organizations' petition for the world's biggest green recovery spending program to reverse the damage from Covid-19, according to balkangreenenergynews.com.

The Green 10 coalition has said it got massive backing in its request for bailouts for "people and the planet" in the European Union and the expansion of ambitious goals for the climate and environment as part of the strategy to repair the damage from the coronavirus. The group of environmentalist organizations published the green recovery demand, signed by more than 1.2 million people, just before a vote in the European Parliament on overhauling the economy after the Covid-19 impact.

The lawmakers stressed in a resolution that the European Commission needs to add the funds for revival to the upcoming seven-year budget and not reduce it. The executives in Brussels must establish a EUR 2 trillion fund by issuing long-dated bonds and disburse the money "through loans and, mostly, through grants, direct payments for investment and equity," the European Parliament said.

It passed the document with 505 votes in favour, 119 against and 69 abstentions. MEPs underscored the green recovery from the Covid-19 pandemic has to have a strong social dimension and address social and economic inequalities.

Green Deal is insufficient

The petition was organized by the European Environmental Bureau (EEB), BirdLife Europe, CAN Europe, CEE Bankwatch Network, Friends of the Earth Europe, Greenpeace European Unit, Health and Environment Alliance, Naturefriends International, Transport and Environment and the WWF European Policy Office. They told EU and national leaders to overcome the downturn "with solidarity, courage and innovation" and not "return to business as usual."

The signatories called on "the establishment of the biggest green investment programme the world has ever seen", according to the environmentalists and nongovernmental organizations, writes balkangreenenergynews.com.

They asserted the European Green Deal "is

a good starting point, but it's far from enough" to tackle the health, economic and climate crises.

No bailouts for polluters

"Let's make it clear it must prioritize the tragedies of people before those of airlines, car, plastic and other polluting industries. Let's make it clear that economic recovery cannot be at the expense of a healthy environment: pollution makes coronavirus deadlier. The Marshall Plan-like scheme to face the economic crisis cannot replicate the mistakes of the bailouts following the 2008 financial crisis: banks and corporations shouldn't be saved at the expense of workers, people and the planet," the association wrote in the petition.

Banks and corporations shouldn't be saved at the expense of workers, people and the planet like last time, the petition reads.

Hundreds of billions must be invested in renovating homes, scaling up renewable energy, restoring natural habitats, boosting public transport and zero emission mobility, and greening agriculture, the call also reads.

EU to become climate neutral by 2040

CAN Europe said scientific evidence and the terms of the Paris Agreement show the European Union would need to lift targets and reduce its greenhouse gas emissions to net zero by 2040.

The United Nations has calculated annual emission reductions of 7.6% are warranted for limiting the rise in global temperature to 1.5 degrees Celsius by 2030, it added. It means the EU would have to increase its emissions reduction target for the next decade to 65% from 40%, relative to 1990, it is also specified in the material published by balkangreenenergynews.com. ■

Romania's Conviction by the Court of Justice of the European Union

EXTREME POLLUTION IN BUCHAREST CALLS FOR SANCTIONS

The indifference of Bucharest authorities in dealing with warnings from the European Commission on the systematic breach of air pollution rules has led in the end to Romania's conviction by the Court of Justice of the European Union (CJEU), following a lawsuit that started in May 2018. The area targeted by CJEU is Bucharest, city with about two million inhabitants.

by **Adrian Stoica**

The European Commission has requested the European court to find that, by systematically and persistently failing, since 2007, to comply with the daily limit values for PM10 concentrations and by systematically and persistently failing, since 2007 until 2014 inclusive, except for 2013, to comply with the annual limit values for PM10 concentrations in the RO32101 area (Bucharest), Romania "has failed to fulfil its obligations under Article 13(1) of Directive 2008/50/EC of the European Parliament and of the Council on ambient air quality and cleaner air for Europe (OJ 2008, L 152, p. 1), in conjunction with Annex XI to this Directive, and that, regarding this area, it has violated, as of June 11, 2010, its obligations pursuant to Article 23(1) of this Directive in conjunction with section A of Annex XV thereto, especially the obligation provided in Article 23(1) the second paragraph of the said Directive, to ensure that the exceedance period is as short as possible".

According to the CJEU judgment, exceeding the limit values for PM10 is sufficient in itself to be able to find a breach of provisions of Article 13(1) of Directive 2008/50 in conjunction with those of Annex XI thereto.

Who is to blame?

If we are talking about the parties responsible for this situation, things get complicated. First of all, we are talking about Bucharest Municipality, which is responsible for preparing the Integrated Air Quality Plan (IAQP). It had to be completed since 2009, but it was drawn up only in 2018, more due to pressure from Brussels. But this plan has quickly reached the court, being challenged by several environmental organizations, which accused that the proposed measure for fighting pollution were insufficient. The Ministry of Environment, Water and Forests is also to blame, as it had the duty to constantly verify whether the measures included in this plan were implemented and brought a real and quantifiable improvement in air quality. This did not happen for over 10 years. Only this year the Environmental Guard fined the City of Bucharest and the district authorities for the inefficiency of measures to fight pollution. After the recent episodes where Bucharest was strongly polluted during week-ends, the Ministry of Environment has decided to install a network of sensors in the Capital. The procurement procedure will start this spring, it will be completed within approximately 3 months and the network will have 50 sensors, Environment Minister Costel Alexe has announced.

ORGANIZED BY WORLD ENERGY COUNCIL/ROMANIAN NATIONAL COMMITTEE

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FOREN REGIONAL 2020

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Algeco's Solutions for 'Social Distancing'

Algeco's solutions for 'social distancing' meet the most stringent requirement of the current period: the rapid adaptation of the interior space to the new rules of safety and interpersonal comfort.

The most important social consequence of the Covid-19 pandemic refers to the normality in terms of the optimal distance between individuals, which requires a minimum interstice of 2 metres. Therefore, notions such as comfort and ergonomics will be rethought so that any enclosed space is adapted to the new requirements.

Solutions for businesses and public institutions

Specialists concluded that the frequent movement of people is one of the most important sources of infection. Therefore, the extension of spaces for the application of new spacing rules may also aim at creating working conditions for employees, which considerably reduces the risk of contamination.

Algeco has become a leader in the field of modular buildings in Europe, thanks to the experience gained in the impeccable and fast delivery of the final product. Their professionalism is put at the service of creating or expanding interiors regardless of their destination: office buildings or accommodation, events, industry, storage, sanitary, locker rooms, laboratories, bedrooms, spaces designed for dining, reading or recreation etc.

In addition, Algeco containers offer you 360° services, which mean a package of benefits adapted to your specific requirements: the full range of furniture, office equipment and accessories, OSH solutions (fire extinguishers, first aid kits, smoke detectors, signage) etc., also services such as internet connection, electricity, security, cleaning services, equipment and complete facilities (water subscriptions, healthy snacks dispensers).

Living nowadays in a new paradigm related to the rules of personal hygiene and work spaces, we now find in the Algeco portfolio a wide range of specific solutions: touch-free handles, plexiglass separator panels, vertical disinfection dispensers, social distancing mats etc.

In order to identify all these necessities, Algeco team offers you the related consultancy, so that the need for a turnkey space is at the level of your expectations.

Solutions for the segment of vulnerable people

The new rules regarding the optimization of interpersonal relations area refer mainly to the elderly and those affected by comorbidities. The reconfiguration of hospitals and social assistance institutions will have to minimize such risks, and Algeco's comprehensive outcomes for 'social distancing' meet all of these requirements, with efficient and fast solutions: separate rooms, appropriate furniture, safety packages (drinking water dispensers, access ramps, microphone communication system, and so on).

Algeco also offers modular visiting rooms allowing face-to-face meetings in a safe manner regarding interlocutors and external factors, preventing the residents of social assistance centres and senior/Care homes from suffering due to the lack of communication and interaction with relatives and loved ones.

The flexibility of Algeco constructions has two valences: on one hand, it refers to the easy annexation of containers on the ground near any institution, on the other hand, it includes European standards in terms of the quality of construction parameters (interior partitions, thermal insulation, electrical and water installations etc.).

In other words, Algeco is closer to you providing you spaces for optimal distancing. ■

Shaping the Future of Energy Segment with Atlas Copco Bolting Solutions

Ricardo Cano, Business Line Manager General Industry in Atlas Copco Customer Centre Eastern Europe, shared with us smart bolting solutions to increase operational efficiency and optimize service costs.

The energy sector is undergoing huge change. What are todays challenges in terms of assembly of big bolts?

There is a transition from fossil fuel sources to clean renewable sources, but all energy sector operations need to increase productivity and reduced costs to remain competitive. This is driving demand for smart bolting solutions that can increase operational efficiency in areas such as faster process times, less bolted joint failures, and optimized service costs.

How to meet these demands?

To address it, the implementation of smart technologies in the factory and also in the field-based environment is a critical path. It will ensure the best quality products are manufactured, installed and operated for the full product life cycle with reductions in both risk and cost.

So, Industry 4.0 tools and data usage is the future also in this segment?

Furthermore, smart tools will enable the interconnectivity and data analytics to be applied through the full value chain of OEMs, from manufacturing to operations and even beyond to partners and service providers all of which drive faster product development, quicker problem resolution, and rapidly deployed process improvements across multiple sites or locations.

If the process control and documentation capability used in production facilities today were to be deployed in the O&M environment, this would have significant positive impact for OEM's, contractors and wind Industry as a whole relating to higher quality delivered work, cost reduction, and improved operational efficiency.

This was not possible in the past, however the new availability of mobile connectivity, cloud and smart devices are enablers that make this very much a reality today. We see these solutions as future and already today Atlas Copco offers SMART bolting tools.

How does it work? How are the tools 'communicating'?

In order to have a truly connected and efficient system it is critical that all bolting technologies (hydraulic torque, bolt tensioning, continuous rotation) have one common user interface, both for operational process control and analysis and traceability of data such as Atlas Copco controller Power Focus 6000.

Which areas is Atlas Copco specialised with bolting solutions?

We are experts in all controlled bolting techniques used for example in energy segment. We offer complete and dynamic range of bolting tools includes hydraulic bolt tensioners and hydraulic torque wrenches, as well as pneumatic and electric transducerized nutrunners. Our big advantage is our production facility. All products are designed and produced in our own plants in UK or Sweden, so we are able to offer our customers the best world quality and furthermore we can design and produce many special bolting tools made for unique applications.

Is it possible to order a demo or rent your tools?

Yes, it is always best solution. We have special VAN fully equipped with Atlas Copco Bolting solutions. Our experts come to the customer premises and after discussion of needs we can find the best solution for the customer. We also offer trainings for bolting tools operators and other customers involved in bolting.

Atlas Copco SMART bolting products

Revo HA + Power Focus 6000

Unigue smart nutrunner with many benefits together with Atlas Copco controller Power Focus 6000.

- 4 model up to 8000Nm will covering many applications.
- First ever swiveling Transducerised tool in this segment.
- Traceability, angle control – High quality assembly
- Faster (2x, 3x), lighter & compact compared to competitors
- Two-handed safety start & ergonomics with weight on two hands
- Socket release for easy release of reaction bar on joint

Reporting to Tools Net, Open protocol

RTA – RT Advance

Hydraulic wrench with hydraulic pump with sensors and provisions for reversible encoder. Angle encoder option empowers tool to report even a small deviation in angle (2048 readable positions over 360˚ rotation) and report errors.

- Covering applications up to 71000Nm
- Built in WIFI
- Multifunction controller
- HD 10” Colour touch Screen
- 16GB inbuilt memory
- 4 identifiers for traceability
- User friendly interface
- Torque, Angle and time based strategies
- Open protocol / ToolsNet

SRB HA

The newest smart cordless battery nutrunner.

- Cordless
- 4 models up to 4000Nm
- Unique Strain gauge torque transducer for better process quality
- Dual trigger as standard for higher safety
- Powerful permanent magnet motor
- IP41 classification for better durability
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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.

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EBRD and Partners Launch SME Equity Research Programme

The European Bank for Reconstruction and Development (EBRD) is launching a dedicated research programme in support of the development of small and medium-sized enterprises (SMEs) in selected countries where the Bank invests.

Funded by the TaiwanBusiness-EBRD Technical Cooperation Fund, the programme will provide research coverage for a set of SMEs listed on the stock exchanges in Bulgaria, Croatia, North Macedonia, Romania, Serbia and Slovenia. The reports will be publicly available free of charge on the newly created Listed SME Research Hub.

The aim is to produce free, publicly available, high-quality research reports to overcome information barriers that depress market liquidity. Making markets more transparent by increasing the amount of reliable information is regarded as key to increasing the availability of financing for SMEs.

The two-year research programme will be conducted by WOOD & Company, an investment bank specialising in emerging markets. The programme is fully aligned with the objectives of the European Commission's Action Plan on Building a Capital Markets Union, which specifically mentions improving access to finance, including risk capital, notably for SMEs as one of the five priority areas.

The following companies are participants in the programme:

- Bulgaria: Gradus AD, Monbat, Sirma Group Holding JSC, Sopharma AD;
- Croatia: AD PLASTIK d.d., Arena Hospitality Group d.d., Ilirija Resort, Zagreb Stock Exchange;
- North Macedonia: Alkaloid AD Skopje, Komercijalna banka AD, NLB Banka AD;
- Romania: BittNet, Conpet SA, Patria Bank, Teraplast;
- Serbia: Fintel Energija ad;
- Slovenia: Pozavarovalnica Sava RE.

Four reports were published at the launch of the programme on May 20, with the remainder to follow in the months ahead. At least five reports per company will be produced during the project period.

"We see enormous potential for the Bulgarian SMEs and we are glad that four companies will be part of this very important programme. It is a great opportunity to get more visibility, attract investors and develop European business horizons for the selected ambitious SMEs," Manyu Moravenov, Chief Executive Officer, Bulgarian Stock Exchange (BSE) said.

"This programme represents a logical next step in the development of the SEE Link area of operations. The lack of information about companies is often the main obstacle to making investment decisions and discovering the region's potential. Zagreb Stock Exchange welcomes this initiative and we are pleased that Croatian stocks will be part of the programme," affirmed Ivana Gazic, President of the Management Board, Zagreb Stock Exchange (ZSE).

In his turn, Hannes Takacs, Acting Co-Head, Local Currency and Capital Markets Development, European Bank for Reconstruction and Development (EBRD) mentioned: "We are very proud to make an important contribution to putting the financing of vital SMEs on broader foundations based on this project. It proves that knowledge is indeed power. SMEs are crucial for the well-being of Europe's economy and in the current coronavirus pandemic it is more important than ever to secure their funding."

"The lack of systematic and continuous

research coverage of companies listed on the MSE, including our blue-chip stocks, is definitely among the main challenges facing our market. This new EBRD project will significantly increase the volume of quality information available on many good regional companies which we expect will lead to positive developments," underlined Ivan Shteriev, Chief Executive Officer, Macedonian Stock Exchange (MSE).

"The EBRD and WOOD & Company are two of BVB's institutional partners in promoting Romanian companies abroad. There is an obvious gap in the research and promotion of smaller companies across the investment community. Supporting these companies in their growth and facilitating their access to investors is a major objective for us," Adrian Tanase, Chief Executive Officer, Bucharest Stock Exchange (BVB) pointed out.

"Belgrade Stock Exchange sincerely welcomes this EBRD project in our ongoing joint attempts to boost all aspects of our region's capital markets. Lack of information regarding particular investment alternatives contributes a lot to the lack of market liquidity. Research coverage will spotlight many valuable SMEs and make them visible to investors, thus creating significant opportunities in their access to finance, Sinisa Krneta, Chief Executive Officer, Belgrade Stock Exchange (BELEX)," said.

"SMEs are the main driving force of Slovenia's economy and therefore have been in the focus of the Ljubljana Stock Exchange for many years. One issue we have been facing all these years has been the lack of coverage for this segment of companies. The new research programme will definitely improve the visibility of Slovenian SMEs and help them attract the attention of the international investor community, Aleš Ipavec, President of the Management Board, Ljubljana Stock Exchange (LSE)," stated. ■

World's 1st Full Electric Aircraft Refueller Transporter

Gaussin and Total are jointly developing the world's first full electric ART® (Aircraft Refueller Transporter). Planned for the Airbus industrial site in Toulouse, this prototype will be capable of towing two fuel tankers, with a fuel capacity of 30 tons each. Delivery is expected at the end of 2020.

This partnership between Gaussin and Total will be drawing on the 40 years of know-how of Saft (a subsidiary of Total) in designing and producing batteries for electric & hybrid commercial and industrial vehicles. Saft will provide the lithium-ion batteries for this future fleet. The batteries will be entirely developed and manufactured at Saft's facilities in Nersac and Bordeaux in the Nouvelle-Aquitaine region of France.

This first firm order will enable Gaussin to expand its offering on the electric vehicles market and Total to provide a solution adapted to the refuelling business. It also paves the way for the development of a fleet of innovative vehicles, specifically dedicated to aviation.

With this development, Total illustrates its commitment to reduce its carbon footprint on the airport platforms it supplies and operates, alongside its customers and partners. Together with society, Total shares the ambition of becoming carbon neutral by 2050 for all of its activities, from its production to the use of the energy products sold to its customers.

Total is a broad energy Group that produces and markets fuels, natural gas and low-carbon electricity. Our 100,000 employees are committed to better energy that is safer, more affordable, cleaner and accessible to as many people as possible. Active in more than 130 countries, our ambition is to become the responsible energy major.

Total one of the world's biggest suppliers of aviation fuel, in France, in Europe and Africa. General aviation, business aviation, airports and airlines: each and every one of those customers receives a personal service offer tailored to its needs. In the world, Total supplies 280 airlines in 300 airports around the world.

Gaussin is an engineering company that designs, assembles and sells innovative products and services in the transport and logistics field. Its know-how encompasses cargo and passenger transport, autonomous technologies allowing for self-driving solutions such as Automotive Guided Vehicles, and the integration of all types of batteries, particularly electric and hydrogen fuel cells. With more than 50,000 vehicles worldwide, Gaussin enjoys a strong reputation in four fast-expanding markets: port terminals, airports, logistics and people mobility. The group has formed strategic partnerships with major global players in order to accelerate its market penetration: Siemens Logistics in the airport field, Bolloré Ports and ST Engineering in ports, UPS in logistics and Bluebus for people mobility.

In October 2019, the Group won the World Challenge for Self-Driving Transport in the Leading Company Category, Best Energy and Environmental Sustainability.

Gaussin has been listed on Euronext Growth in Paris since 2010. ■

Kaeser Kompressoren Combatting Coronavirus

MOVING FORWARD TOGETHER MINDFULLY

Kaeser Kompressoren takes the health and well-being of its employees with the utmost seriousness and has implemented extensive preventive measures effective immediately and also moving forward.

Thomas Kaeser,
Chief Executive of Kaeser Kompressoren

Employees who have a laptop and for whom remote working makes sense are to perform their work for Kaeser from home.

Thanks to modern data transmission technology, worldwide networking of the company and numerous high-performance software programs, this can be reasonably implemented and enables employees to carry out their work almost as effectively as if they were in the office.

Maximum hygiene and safety are ensured, wherever possible, on the company premises.

Production operations continue to run smoothly at present, as does administration.

"Health is our most valuable asset and must be protected. Kaeser Kompressoren has always been known for its measured approach in dealing with challenges and for the ability to find the most appropriate and well-founded solution. The same applies in this case. With solidarity, respect for all others and determined discipline, we will be able to overcome this extraordinary challenge together," stated Thomas Kaeser, Chief Executive of Kaeser Kompressoren.

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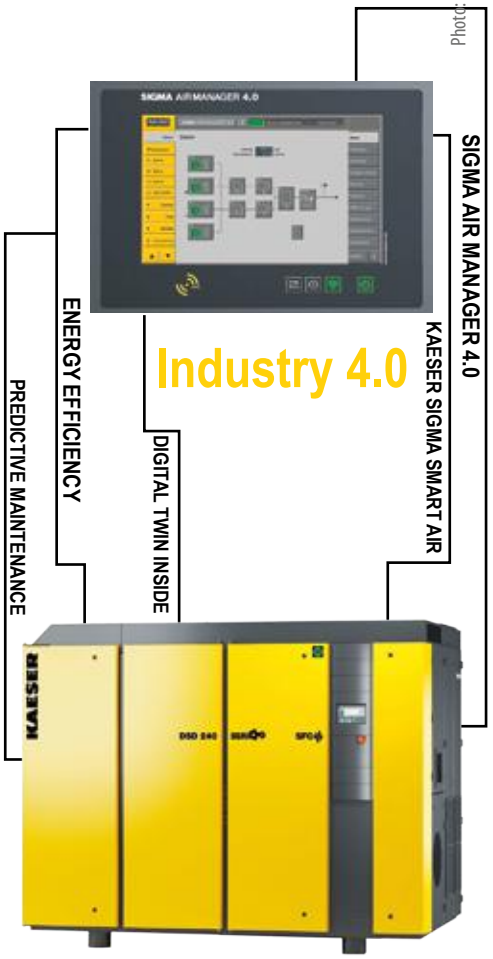

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Impact of SARS-CoV-2 Coronavirus Crisis on the Energy Sector

ACTIONS AND MEASURES PROPOSED BY RNC-WEC

The Romanian National Committee of World Energy Council (RNC-WEC), an organization with activity in the energy sector in Romania, has the mission of promoting Romania's sustainable energy development and the efficient use of primary energy resources in all forms. RNC-WEC currently has over 100 collective members (the most important regulatory authorities, institutions, institutes in the field of energy, the most important operators on the electricity market, producers, transmission operators, distributors, suppliers, energy users; associations and professional societies, national committees and centres, academies and universities) and about 270 individual members, representative specialists in the field of energy, from the research, industry and academic sectors. The total turnover of the members amounts to over RON 70 billion, and the total number of employees is almost 75,000. Within RNC-WEC activities the connection with the members of the association represents a priority. The collection and correlation of the opinions and points of view of the members in order to constitute a unique voice addressed to the authorities regarding the major problems and with high economic impact is permanent or whenever events with major impact on the society appear.

The World Energy Council (WEC) has prepared a study, in which Romania was also a participant, on the long-term impact especially on the energy sector and post-pandemic prospects generated by the SARS-CoV-2 coronavirus. This allows identifying the future directions of action, based on the evaluations of experts in the field from around the world.

Thus, a Working Group was created on 'Assessing the impact of the crisis generated by SARS-CoV-2 in the energy sector in Romania and establishing mitigating measures' through a two-step approach:

1. The Short- and Medium-Term Action Plan (SMT)

Within this Short- and Medium-Term Action Plan, the proposals of RNC-WEC members were collected and transposed into concrete actions, which will be sent to authorities and the relevant stakeholders, so that the impact of the current situation generated by the SARS-CoV-2 coronavirus crisis is mitigated. The actions and the plan will be correlated with the actions carried out in other organizations that carry out similar actions. New legislative proposals or amendments of the existing legislation (primary and secondary) have been considered, to diminish the impact of the state of emergency and pandemic caused by SARS-CoV-2 coronavirus on the Romanian economy and the energy sector in particular.

1. A. Policies to offset losses caused by the crisis:

1. Provision of funds for joint investments, for sanitary materials and equipment in pandemic situations - partial financing from the state;

2. Provision of funds to cover expenses with the affected labour force (protection of qualified personnel operating critical infrastructures) - (legislative amendment);

3. Alignment of measures imposed by local/county authorities with the measures and intentions of central authorities expressed under the Military Ordinances (intervention teams of the distribution companies, rights of access etc.) for all utilities;

4. Applying the provisions of the legal acts in force, regarding the postponement of the payment of utility bills, only to SMEs that are in difficulty due to the adopted measures;

5. Ensuring a framework for recovering the historical losses registered by SLRs by applying regulated prices and tariffs;

1. B. Amendment of the primary and secondary legislation:

6. Applying the Regulation (EU) 2019/943 and transposing the Directive (EU) 2019/944, by amending the primary and secondary legislation (Regulation 943 is in force and Directive 944 has an implementation deadline: December 31, 2020);

7. Clarifying the definition of the vulnerable consumer and developing the functioning mechanism of the aid scheme for it;

8. Starting the decarbonization plan for electricity producers based on fossil fuels;

9. Approving and speeding up the start of the NECP plan, with all the comments resulting from the public debate and recommendations of the European Commission;

10. Adoption of a procedure (by Ministerial Order) for the extension of expired or expiring certificates of Energy Managers and SPSE, respectively expired or expiring authorizations of Energy Auditors and for ensuring the continuity of issuing new authorizations/certificates;

11. Amending the ANRE Order 61/2020 regarding the separate operation of the energy storage facilities with the dispatchable units. This would stimulate investments in storage facilities;

1. C. New primary and secondary legislative provisions:

12. Establishment by GEO of the obligation of the system operator to purchase capacity reserves from coal-fired energy producers for a period of 6 months or until the end of the year for NPS safety (there are drought warnings, imported energy is volatile, and renewable energy will not be available at any time);

13. Establishment by GEO of the obligation to purchase a minimum electricity production from coal-fired electricity producers (E.g.: 500 MW) for NPS safety (there are drought warnings, imported energy is volatile, and renewable energy will not be available);

14. Introduction of carbon tax for energy imported from non-EU countries - the measure is provided for in the Green Deal with a deadline from the European Commission to present a proposal in 2021 (MT).

2. Long-term (LT) program of measures

2. A. Legislative amendments, allowing to boost investment in the energy sector and implementing strategic projects:

1. Accelerating/supporting the implementation of investment and modernization programs for all production, transmission and distribution operators, with state or private capital by amending the Public Procurement Law in order to open the domestic market for engineering, manufacturing, construction, assembly companies in Romania;

2. Amending/rewriting the Energy Law 123/2012 in order to adapt to the new market conditions, transpose the current European legislation;

3. Clarifying the possibility of using and introducing PPA-type bilateral contracts and the mechanism of contracts for difference (CfD);

4. Using the window of opportunity for coal-fired producers determined by the reduction of the price of emission allowances and a greater flexibility of the European Commission regarding the acceptance of investments for 'greening production';

5. Clarifying the royalty and tax policy and reviewing the primary legislation regarding natural gas, applicable for both onshore and offshore;

6. Clarifying the situation of the green certificates market and setting new support schemes for the production of electricity from renewable sources, respectively for the production of electricity by cogeneration;

2. B. New legislative provisions, allowing to boost investment in the energy sector and implementing strategic projects:

7. Increasing investments in transmission and distribution networks by keeping by ANRE a return (RAB) that stimulates Network Operators to make the necessary investments, focusing on smart grid and improving the quality of services offered to consumers, as well as through fiscal and legislative measures supporting a reduced cost of the invested capital, given the mutual benefits for operators and consumers;

8. Drafting the legislative framework allowing the development of the energy storage infrastructure;

9. Creating the secondary regulatory framework on the extension of the network operators' role, as system operator for the situation of connecting

renewable sources to the distribution network, as well as clarifying the authorization of alternative transport;

2. C. Schemes and solutions to finance the activity and investment programs/strategic projects of NPS:

The following have been considered:

a. using the amounts allocated for Romania following the issuance of Eurobonds launched by the ECB;

b. using the amounts allocated by the EU Commission within the EUR 100 billion package provided through the SURE program;

c. capitalizing on the amounts redistributed from the European Cohesion Fund, the European Fund for Regional Development, as well as the European Social Fund;

d. using new financing schemes from the funds allocated to Romania within NECP;

e. reprioritization of the amounts from the current funds and budgetary allocations;

f. new schemes for subsidizing, compensating and attracting investments and investors through primary and secondary legislative changes with priority for strategic areas and with influence on BS etc.

10. Financing the National Plan for Research-Development and Innovation 2015-2020 (NPRDI III), in order to avoid the loss of European funding;

11. Reassessing the potential of Romanian consulting, engineering, manufacturing, construction and assembly companies. Reconsideration of the conditions for involving Romanian companies in the construction, operation and maintenance of the NPS. Reconsideration based on Energy Security criteria and risk analysis of the Romanian engineering potential;

2. D. Investment projects/strategic projects for the energy sector in Romania

12. Supporting the refurbishment project of U1 Cernavoda, in order to extend the lifespan by 30 years;

13. Launching the investment project Units 3+4 Cernavoda;

14. Increased investments in the digitization of the sector, as the crisis has shown that there is a need for additional investments in this field (smart metering, billing, SCADA systems, fully automated stations etc.). In addition to the efficiency advantages thus introduced, digitization allows not only remote work, but also staff protection;

15. Implementation, by ensuring the legal and investment framework, of a national program for the development and expansion of natural gas networks, financed by the state budget and/or European financing (e.g. bonds and low interest loans) carried out through transmission and distribution operators and through Administrative Territorial Units (ATUs). Also, investment program to upgrade electricity and thermal energy networks;

16. Financing the second stage of the project 'Preparation activities for the realization of the ALFRED research infrastructure in Romania (PRO ALFRED)', within the National Plan for Research-Development and Innovation 2015-2020 (NPRDI III);

17. Financing the ALFRED Project - Stage I, 'ATHENA support research infrastructure (pool facility for experiments and thermo-hydraulic tests) and Chem, Lab (laboratory for lead chemistry)';

18. Starting Black Sea gas exploitation and Organizing the 11th Licensing Round for new petroleum blocks.

Information from WEC studies on business impact, future forecasts of post-pandemic processes and scenarios developed by WEC, based on questionnaires completed by experts from around the world, were used to develop the aforementioned study.

Given these things, RNC-WEC has acted and will continue to act in four stages, as follows:

Stage 1

Collecting the opinions of the collective members of RNC-WEC in order to evaluate the economic impact of the crisis generated by the SARS-CoV-2 coronavirus on the Romanian economy and, especially, on the energy sector and business activities of the association members - in the two approaches: SMT and LT - post pandemic.

Stage 2

Preparing the Action Plan on SMT, considering the results of the stage of collecting the members' opinions, regarding the evaluation of the economic impact of the crisis generated by the SARS-CoV-2 coronavirus on the Romanian economy and the business activities of the association members.

Stage 3

Preparing the Long-Term (LT) Program of Measures, considering the results of the stage of collecting the members' opinions, regarding the evaluation of the economic impact of the crisis generated by the SARS-CoV-2 coronavirus on the Romanian economy and the business activities of the association members.

Stage 4

Completing and periodically updating the Plan and the Program, as new elements are identified or with the information received from RNC-WEC members.

Finally, the working group will submit to the authorities the SMT Action Plan and the LT Program of Measures, in order to take into account and promote legislative actions and regulations. ■

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Impact of COVID-19 on Renewable Energy Auctions

In a recent Policy Brief, AURES assesses the impact of COVID-19 on Renewable Energy Auctions.

AURES is a European research project on auctions for renewable energy support (RES) in the EU. The general objective of the project is to promote an effective use and efficient implementation of auctions to improve the performance of electricity from renewable energy sources in Europe.

According to the above-mentioned report, the COVID-19 pandemic and its economic and political disruption have influenced renewable energy (RES) auctions as follows:

- RES procurement: Decreased energy demand, resulting in potentially lower short-term demand for RES and potentially more EU Member States meeting their 2020 RES targets without additional policy action.
- RES project delays and auction delays: Disruptions in global supply chains and national permitting procedures might endanger project realization and increase penalties. Several EU Member States have prolonged realization deadlines while others have postponed or cancelled auctions.
- RES finance: Higher RES financing risks through increased country and policy risk, less availability of RES project finance with shift to government-backed lending for corporations.
- Wholesale market risk exposure: Falling wholesale market prices pose significant challenges for projects without market premiums with sufficient floor prices (e.g. merchant plants and plants with low fixed premium).

Mid-term impacts on RES auctions are uncertain and climate-friendly economic stimuli packages could and should increase public clean energy spending and access to finance. Governments might already consider the following immediate adjustments in their RES auction design:

- Extending realization deadlines of awarded projects and for upcoming auctions;
- Allowing for longer award periods & increasing digitalisation of auction procedure;
- Adjusting auction schedules but (if possible) avoiding downward auction volume revisions.

Impact on RES procurement

Auctions for renewable energy (RES) support are market-based, competitive bidding processes to identify the most appropriate RES projects to be constructed within a certain time frame and allocate support payments to these projects. Most EU Member States have introduced RES auctions that seem to have resulted in strong price decreases.

The COVID-19 pandemic, its consequential lock-down of economic activity, the increased risks for investors and fears about an economic recession, have had profound immediate effects on the energy sector. Power demand has strongly decreased and there is high uncertainty for the mid-term. Industry associations worry that a reduced power demand and tighter budgets could reduce new auction volumes of RES projects.

Environmental groups, industry associations and international organizations such as the International Energy Agency and the International Renewable Energy Agency, however, call for an increased investment in clean energy. A growing number of EU Member States stresses that the Green New Deal should be central to a resilient recovery after COVID-19. National economic-stimuli packages might include sustainability criteria, provide additional funding or credit lines to clean energy and be targeted to fund more climate action. A discussion on linking air pollution to higher COVID-19-related deaths might also increase pressure on exiting coal generation and shifting to RES faster.

Some governments might consider reducing new RES auction volumes, but this would problematic. Long-term planning certainty is particularly important for the renewable energy industry and even more so in times of uncertainty. Aiming for high levels of competition to achieve low prices in RES auctions, countries usually seek to provide investors with a multi-year auction schedule, including capacity volumes per technology.

The Spanish wind industry stressed the urgency to publish reliable auction schedules during the Covid-19 crisis. Adjusting such scheduled auction volumes downwards due to lower short-term energy demand would further endanger an already challenged industry - first intensify competition (due to oversupply) and finally leading to concentration, and thus erosion of competition and higher RES prices in the midterm. While governments might be warried to avoid short-term end-consumer price increases, maintaining high volumes of RES auctions has the advantage that costs to consumers in general do not occur at the

time of the project award but are stretched as energy payments over 15 to 20 years.

Considering the nationally binding 2020 RES targets for the EU Member States, the strong reduction of energy demand leads to a distorted picture that may impede some Member States to take additional measures to push RES deployment. According to projections made in 2019, some countries were at risk of falling short of their 2020 target as policy initiatives appeared insufficient to trigger the required RES energy volumes. The impact of COVID-19 on the energy sector may change that picture. As the overall energy demand is decreased, the relative share of RES increases, especially in the electricity sector. This helps Member States to clear the 2020 hurdle without taking additional action. As a consequence, Member States may refrain from taking additional measures in 2020 or in the following years. Nevertheless, the 2020 targets are also binding beyond 2020, as Member States shall not fall below the 2020-threshold in their trajectory towards 2030. Once the economic activities pick up, so should the RES. Member States should therefore feel encouraged not to rest on a unique COVID-19 effect in 2020, but to keep their ambitions high.

Impact on RES project realization

Besides energy demand, the COVID-19 pandemic has significantly disrupted global supply chains. Renewable energy supply chains have also seen strong delays. While the majority of Europe's wind turbine and component manufacturing sites continue to operate, the global wind industry states that it is experiencing logistical delays. Travel bans are impacting the availability of construction experts. Solar PV in Europe is affected through supply chain interruptions for modules mainly from China, although some production has already rebounded. Planning authorities are also affected by the shutdown and permits can be delayed.

These interruptions may cause developers to miss project realization deadlines of already awarded projects and face financial penalties. As a consequence, industry groups such as Wind Europe or the German PV association have called on governments for flexibility on project realization deadlines. For upcoming auctions, the Spanish Wind Energy Agency however stresses the importance that project are realized within the established realization deadlines, outlining that investment and employment into renewable energy usually do not occur immediately with the award of the auction, but rather in the project realization.

Delay of RES auction execution

Several governments in Europe have adjusted the project realization dates of already awarded projects or of upcoming auctions. In Germany, the auctioning authority BNetzA prolongs the realization deadlines of awarded projects if bidders can proof delays of component delivery or permits, albeit it remains to be seen whether this provides enough legal certainty for investors. France has also announced to extend realization deadlines. Greece adopted a Legal Act which prolongs the realization deadline by six months for RES projects with realisation deadlines on or before 30 June 2020, while projects with realization deadlines between 1 July and 31 December 2020 receive a four-month extension. Accordingly, the expiration dates for the necessary licenses and grid connection offers have been prolonged by four to six months.

Other countries have postponed planned auctions, such as France for solar (by an average two months), Ireland for solar (by 28 days) and Portugal for solar (paused). France has split the volumes for both the onshore wind and PV auctions foreseen in July, auctioning one third of the initial volume in July and the remaining two thirds in November. In Slovakia, the first RES auction round was cancelled on 1 April and its design might consequently be changed by the new government. Some countries that went ahead with their planned auctions nevertheless witnessed promising participation and prices, with Greece awarding a 200 MW solar project at a record-breaking tariff of EUR 0.04911/kWh. The Netherlands has also kept to the deadline for its wind offshore auction end of April.

Impact on RES project finance

While the mid-term consequences of COVID-19 on project financing are difficult to predict, the disruptions caused by the pandemic might have a significant impact on financing risks and capital markets. Interviews of the AURES consortium with banks have shown higher risk awareness and hesitance to provide capital.

Financing risks might be affected through new country and policy risks. Country risks can increase because of the economic shut-down, expected long-term economic challenges and public debt downgrading country ratings. Policy risks may emerge when policy makers change existing policies, postpone support measures, actions or auctions, especially if societal support for the energy transition may decrease during an economic crisis. In some countries where in the past governments reacted to economic crisis with retroactive measures on RES support, there are concerns of another retroactive change. Turmoil in capital markets can also affect RES financing. As banks shift lending to government-backed loans for corporations affected by COVID-19, the availability of capital for RES project finance decreases and costs increase. Companies developing projects through

balance sheets might be able to take advantage from government-backed loans, but some may be affected through devaluation of assets and might face further hurdles to balance sheet financing as results of tighter balance sheets. This effect is expected to be most severe for developers and owners with high market price exposure. As governments are considering further economic relief packages, green growth activities could however ease the availability of green finance for RES. New measures might include access to low-interest financing, government-backed guarantees and in general more favourable investment environments for the RES sector.

Impact of decreasing wholesale market prices

Falling RES costs and the expectation of increasing mid-term power prices (driven by less coal and the electrification of transport and heating) has sparked a debate of whether revenues from the whole sale market only might be sufficient and whether RES auctions awarding guaranteed minimum prices for power will still be needed. While the mid-term price-impact of Covid-19 still needs to be further assessed, fallen wholesale market prices, with power now trading below 25 EUR/MWh in most parts of Europe, and potentially strong fluctuations, are challenging merchant plants that do not receive a market premium. Similarly, fixed premium schemes that do not provide a significant floor price are more challenging than floating premiums that provide such a floor. These developments could press Member States to continue RES support schemes that guarantee floor prices for RES to ensure that they comply with their RES target.

How to adjust the RES auction design

Countries should assess and monitor the risk that COVID-19 and the lock-down pose on project development cycles and risks. As short-term measures, auctioning authorities might implement the following:

Extending realization deadlines of awarded projects and for upcoming auctions

• The extension period should be tailored to local circumstances, but at least consider the time of the lockdown. The success of the measure will also depend on whether the expiration date of permits allows a delay in project completion.

• Auctioning authorities might choose to extend realization deadlines automatically and uniformly or only based on application and proof of factors causing delays (e.g. delayed component delivery). An automatic and uniform extension would ease the administration and provide legal certainty to developers.

• Authorities should avoid excessive extensions of the realization deadline and avoid situations in which individual concession owners start to renegotiate deadlines and apply for individual extensions – this might unnecessarily block auctioneer capacities and create bureaucracy. The length of deadline extensions could consider the length of the lock-down. Too-long extensions in the realization period could pose challenges for the order pipeline of component manufacturers. Prolonged realization deadlines could in principle incentivize some project developers to delay project realization to take advantage of falling component prices. However, in a volatile price environment many developers might find this too risky.

Allowing for longer award periods & increasing digitalisation

• Auctioning authorities that require physical submission and evaluation of bids (e.g. Germany) can be challenged in a lock-down and might need to change their evaluation process or allow for more evaluation time. Auctioning authorities that allow for a web-based submission and evaluation of bid are less affected. Such digital solutions could also be provided at planning authorities responsible for the issuance of permits.

• Auctioning authorities should consider transferring bidder interaction to secure, digital solutions. Digital submission platforms, online bidder-auctioneer interactions, web-dialogue meetings and accepting e-mail communication have been successfully implemented by RES auctioneers across the world.

Adjusting auction schedules but (if possible) avoiding downward auction volume revisions

• Several EU Member States have halted or postponed auctions as reaction to the COVID-19 crisis. While some countries have codified auction schedules in law that cannot be easily changed, auctioning authorities in other countries are more flexible to adjust auction schedules.

• Delaying auctions can be an effective short-term measure to avoid immediate adverse consequences for auction outcomes. Unnecessary delays and cancellation of auctions might however not only impact the reaching of RES targets, but also cause interruptions in the supply and project development chains and adversely impact auction outcomes in the medium to long-term. While power demand is dropping in the short-term, several EU Member States were not on track to fulfil their RES targets and should ensure to maintain the RES project development pipeline.

• While auctions can be postponed in reaction to the COVID-19 supply chain and construction disruptions, EU Member States should in general refrain from adjusting RES auction volumes downwards in already announced auction schedules. The impact of COVID-19 on RES investments needs to be continued to be monitored so that countries can react should competition in auctions be significantly reduced. ■

Offshore Wind to Attract More than USD 211 Billion by 2025

Where will investors in offshore oil and gas look as the energy transition starts to take hold? While the oil & gas sector remains the largest for the offshore supply chain, we expect the offshore wind market to grow more attractive for traditional oil and gas players.

There is limited crossover today, but first movers have gone with the wind and more will soon follow. As interest and investment in offshore wind grow, investment in offshore oil and gas is likely to stabilise, narrowing the gap between the two sectors. Despite a 29% drop in the average global capex per megawatt (MW) – a measure of the investment per megawatt generated – we forecast more than USD 200 billion in capex will be deployed in offshore wind between 2020 and 2025.

How do offshore oil and gas and offshore wind compare for investors? Here are three factors to consider.

1. Offshore wind investments offer greater certainty and transparency

The transparency and certainty of offshore wind is high because deployment is largely tied to government incentives. In fact, 82% of the forecast offshore capacity to 2025 has been awarded a support scheme or is in more advanced stages of development.

Compare that to global offshore upstream oil and gas capex, where the current trend for short-cycle projects lowers the visibility and certainty of investment outlooks beyond 2022.

2. The offshore wind supply chain is entering a

period of transformative growth

Offshore wind projects are changing; the offshore wind supply chain will have to change with it. The number of project interfaces – the supply deals associated with a project – is both broadening and decreasing, while the size of projects and contracts is growing. Project sizes and clusters of projects will increase by 63% by 2025. To win these larger deals, smaller supply chain players are consolidated to create companies capable of capturing the larger work packages. Moreover, the larger work packages are also attracting the larger O&G players to the offshore wind industry.

Meanwhile, changes in project characteristics (the scale, complexity, water depth and distance from shore) change the way in which capex is distributed along the value chain and intensifies requirements to equipment and production capabilities.

3. Offshore wind offers lower risk and lower returns

Investors follow the money. That was the lure of US tight oil, with average project returns of around 30%. And even at USD 55-60 dollars per barrel of oil, most new offshore oil and gas projects are making double-digit returns. So, why would an investor instead choose an offshore wind project with single-digit returns?

There's more work to do to make renewables projects attractive, even economic, to the mainstream of investors. But, any investment in the oil and gas sector is now subject to 'energy transition risk', which encompasses falling demand for oil, the potential cost of the carbon intensity of assets, and more. There's also a real possibility that both upstream project returns and renewables project returns will evolve, taking into account changing cost of capital, government subsidies and technology development. In the context of the energy transition, we expect offshore wind to become an attractive low-risk investment, particularly to carbon-heavy portfolios.

What to look out for in the 2020s

Offshore wind isn't a deep-water game – yet. Today most activity is clustered on the offshore shelves around Europe, China and South Asia, with North America catching up. What's got the attention of many oil and gas investors is the large potential of offshore wind and the fact that the wind developments are sited in the mature, well-established upstream areas they already know well. It's conceivable that there will be a point of convergence in those regions in the 2020s where offshore wind investment will match oil and gas. ■

Talking About Green Deal While Pollution Is Still Higher

ROMANIA AMONGST SIX MAJOR REMAINING LIGNITE COUNTRIES

Power sector emissions fell by 13% (129 MT), due to Europe's coal collapse in 2019. Hard coal fell by 28% (81 MT) and lignite fell by 18% (60 MT), offset by a 3% (12 MT) rise in gas & oil generation, according to the analysis 'Global Electricity Review 2020' realized by think tank Ember. According to it, around half the power sector emissions falls came from coal-gas switching, with the other half from new wind and solar installations.

by Adrian Stoica

Photo: Valentin Matei

- Coal power emissions are now down by 43% since 2013 – hard coal is down 57% and lignite is down 26%. In that time, the remaining gas & oil generation emissions have risen by only 7%. This led to a 29% fall in total power sector emissions in just six years. Wind and solar have replaced coal, with help from an increasing carbon price and national coal phase-out policies.
- Industrial emissions fell by 2%. This is more due to a fall in industrial production than efficiency increases. Industrial production fell 0.6% in 2019 according to EUROSTAT, including a 5% fall in steel production.
- Aviation rose 7%. Jet had the biggest increase, of 11%. The biggest aviation emitter, Ryanair, increased by 6%, and is still the 9th biggest overall emitter in Europe.

Power sector decarbonisation, a long way to go

The power sector still accounted for over half (52%) of EU ETS emissions in 2019. Even after an impressive 29% fall in the last six years, rapid cuts to power sector emissions can continue, is shown in the cited analysis. Lignite power plants emitted 17% of all EU ETS emissions, yet generated only 9% of Europe's electricity. Hard coal emitted another 13% of EU ETS emissions, despite generating only 10% of Europe's electricity. The remaining gas-oil generation makes up 22% of EU ETS emissions. In total 844 million tonnes of CO2 were emitted from the power sector in 2019, summing to 52% of total EU ETS emissions. More wind and solar is needed. While the power sector is making progress, annual renewables deployment must double from its 2010-2019 average in 2019-2030 just to meet existing EU targets.

Top 10 biggest polluters in Romania (kt CO2)	
Complexul Energetic Rovinari	4,629
Galati Steel Works	4,193
Complexul Energetic Turceni	3,296
Isalnita Power Plant	1,818
Azomures	1,579
Craiova II thermal power plant	1,268
Brazi Power Plant	1,256
Petrobrazi Refinery	1,603
Ciment Alesd (Holcim)	1,049
Ciment Campulung (Holcim)	1,040
Source: Bankwatch	

Carbon emissions reduced by 2% in 2019

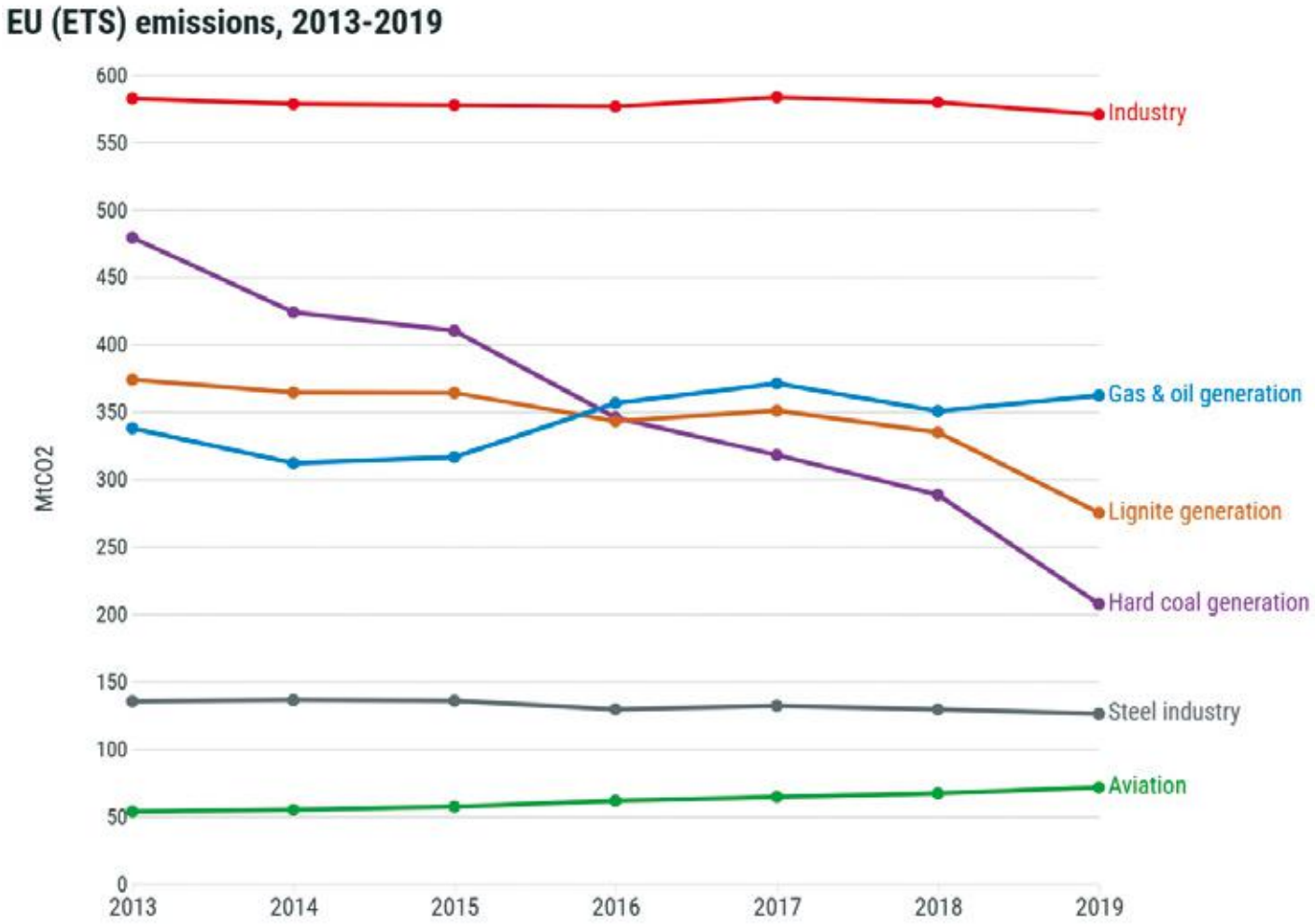
Analysis from the Global Electricity Review 2020 by climate think tank Ember shows that global carbon emissions have decreased by 2% last year, the steepest drop since 1990 as the United States and the European Union turns towards cleaner energy sources, power from coal plants fell by 3% last year, despite the fact that China's dependence on coal continued to increase to take up half of the global share of coal generation. The overall decrease is mainly due to the fact that power from coal plants halved in the United States and Europe since 2007.

However, Ember's experts warned that this decrease is mainly due to one-off factors such as a milder winter season last year, and the slight cut in carbon emissions is not enough to catch up to the rate at which the climate crisis is intensifying. "Progress is being made on reducing coal generation, but nothing like with the urgency needed to limit climate change," the report wrote.

The researchers reiterate that while the US and Europe is showing signs of improvement, China's growth in coal is greatly concerning and will hamper efforts to fight the climate crisis.

Amid the coronavirus outbreak, China's electricity demand and industrial output has taken a tumble, which led to a significant slash of its carbon emissions by 100 million metric tonnes. Transportation links and cities coming to a virtual standstill has also drastically improved the levels of pollution in the country, with NASA satellite images showing a plummeting of the amount of nitrogen dioxide in the atmosphere in Wuhan.

But experts say that this phenomenon is likely to be temporary. As China's protective regulations and infection rates ease, the country's huge power generation and industrial capacity will quickly drive up output again to its regular levels of coal consumption. Though renewable wind and solar energy use has steadily increased over the years to make up 8% of the world's current electricity supply, the report emphasised that the world will need to record a compound growth rate of 15%

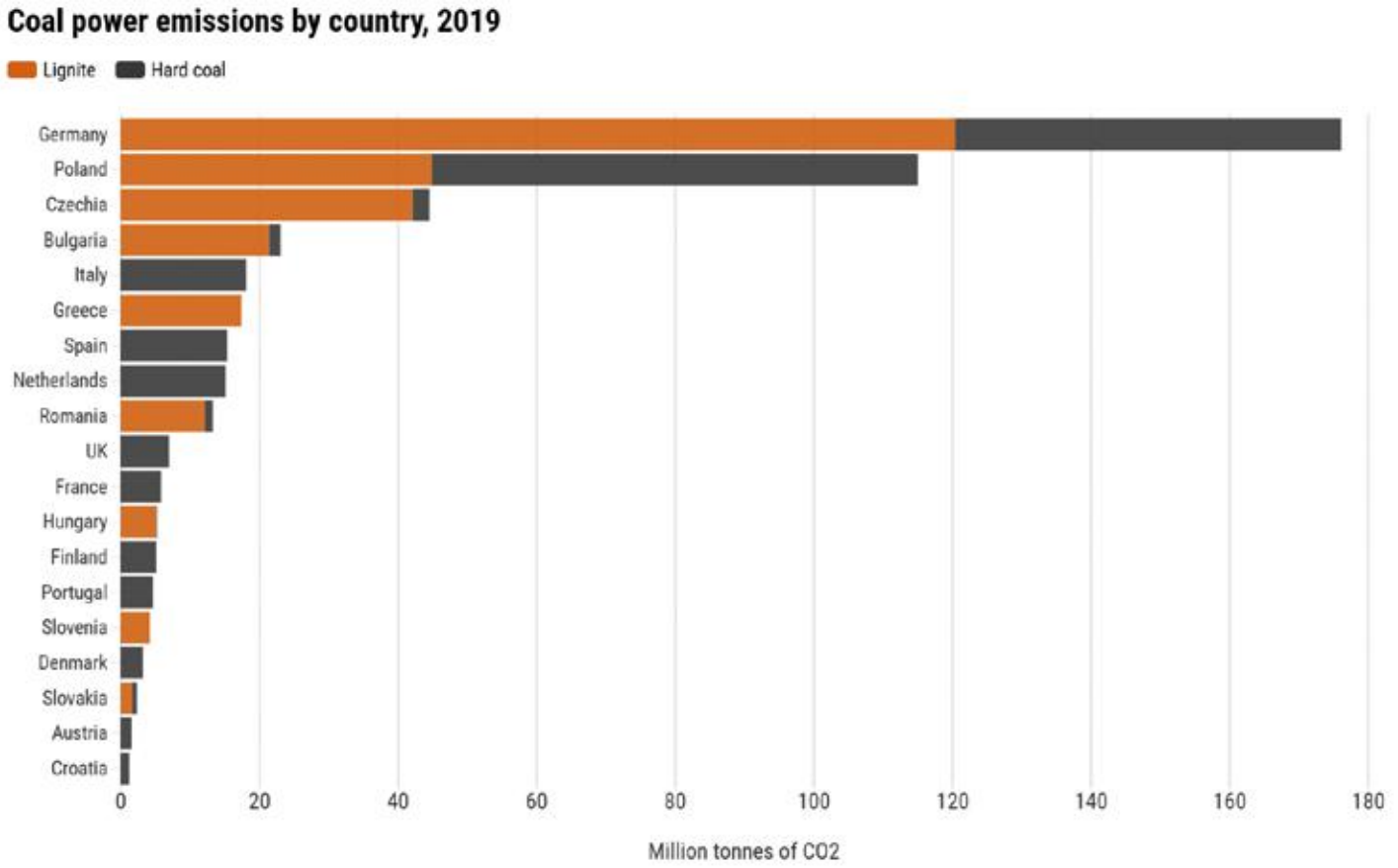


for both wind and solar generation every year to meet the goals of the Paris Agreement. This will require a 'colossal effort,' the report warned.

The six major remaining lignite countries

To ensure a further rapid decline in emissions, the phase out of lignite power plants is an urgent priority. The six major remaining lignite countries are: Germany, Poland, Czechia, Romania, Bulgaria, and Greece, according to the above-mentioned report. Their lignite emissions are responsible for 17% of all EU ETS emissions, yet generated only 9% of Europe's electricity. Of the six countries, only Greece has a sufficiently ambitious timeline to phase-out lignite. Germany's 2038 phase-out date is too late; it's both incompatible with the Paris Agreement and an abdication of the required climate leadership from the EU's largest economy. Similarly, while Czechia has a set up a coal commission which will set an end date for lignite, the dates currently under discussion do not reflect the urgency of the task at hand. In Poland, Romania & Bulgaria a phase-out of lignite is not even under discussion. Hard coal is on a path to phase-out, with the exception of Poland. Poland's hard coal emissions exceeded Germany's in 2019 for the first time. This means Poland's share of Europe's hard coal emissions has doubled from 16% in 2013 to 33% in 2019. Poland needs to urgently address not only its lignite emissions, but also its hard coal emissions. Poland's coal power accounts for 62% of its EU ETS emissions.

The steel sector makes up 8% of EU ETS emissions. Approximately 80% of these emissions are from just 30 blast furnaces. While traditionally considered hard to decarbonise, the technology to make new coal-free steel at these sites is developing quickly; the use of hydrogen is now considered a likely long-term solution. A number of demonstration projects are in development (hybrid, for example) but significant policy support will be needed before large-scale deployment takes place. For recycled steel, coal-free production is already



possible via electric arc furnaces (EAF) powered by renewable electricity.

Therefore, in the future, steel production – either powered by electrolysed hydrogen or powered directly by electricity using EAFs – will require huge amounts of zero-carbon electricity. Consequently, an over-build of wind and solar across Europe is needed to help power steel's transition. Adding up the power sector and steel, wind and solar electricity could replace at least 60% of 2019's EU ETS emissions. Governments should work hand-in-hand with steel companies to transition these sites. Most countries have just one or two blast furnaces, so bilateral solutions between governments and steel companies may yield the most optimal response.

The government response to COVID-19 must be to protect and create jobs. Steel sites are often steeped in over 100 years of steel-making history, still with 10,000's of employees in the steel value-chain in the same region. As we bounce out of lockdown, COVID-19 provides an opportunity to give the investment and innovation needed to future-proof the steel industry, onto a pathway of coal-free steel.

German thermal power plants, the biggest polluters

Lignite power plants are occupying the most positions on the list of the top three CO2 emitters in the EU Member States. The biggest CO2 emitter in the EU is the Belchatów thermal power plant in Poland, followed by six thermal power plants in Germany.

In Romania, the top three positions were held last year by Rovinari thermal power plant, within Complexul Energetic Oltenia (4,629 kt CO2), the steel mill in Galati (4,193 kt CO2) and Turceni thermal power plant, also within Complexul Energetic Oltenia (3,297 kt CO2). In total, CO2 emissions from the most polluting thermal power plants were 7,490 kt, well below the pollution recorded by the other large lignite-based energy producing countries.

For example, in Germany, Poland, Czech Republic and Bulgaria, emissions coming from the top three polluters in each country, lignite-fired power plants, totaled 58,636 kt, 40,808 kt, 12,875 kt and 19,316 kt of CO2 respectively. ■

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Dividends in Times of Pandemic

Dividends paid to shareholders of companies around the world could drop by up to 35% in 2020, at a time when the coronavirus pandemic will reduce companies' profits, according to data published by the asset management company Janus Henderson. In the first quarter, the crisis had a limited impact on the payment of dividends, which increased by 3.6% globally, to a record level of USD 275.4bn. What is the situation of energy companies in Romania?

by **Daniel Lazar**

The level of uncertainty for the rest of the year is so high that Janus Henderson has said it couldn't provide an accurate estimate on dividends paid for 2020, so it has provided several scenarios. According to the optimistic scenario, global dividends will drop by at least 15%, to USD 1,121bn this year, while, in the worst-case scenario, dividends could drop as much as 35%, to USD 933bn. "The breadth of the range reflects the rapidly changing crisis and the likelihood that many companies will simply reduce their payouts, rather than cancel them altogether," Janus Henderson says.

On regions, Europe and the UK would be particularly affected by the decrease in dividends, the regulators requesting banks to suspend payments to shareholders, and several oil companies have already decided to cut dividends. In turn, the US could be less affected, as the US companies would prioritize share buybacks rather in relation to dividend payment, Janus Henderson estimates.

Hidroelectrica will distribute dividends in addition to those initially provided

The largest power producer in Romania, Hidroelectrica, controlled by the state through the Ministry of Economy, Energy and Business Environment (MEEMA), with a 80% stake, will grant shareholders additional dividends of RON 750mln, in addition to those of over RON 1.25bn already considered, the proposal in this regard of Fondul Proprietatea, which owns a 20% stake in the company, being approved by the majority shareholder, payment following to be made by September 30. Therefore, the Romanian state will collect RON 600mln of this additional distribution and Fondul Proprietatea - RON 150mln. Including the initially proposed distribution, of RON 1.253bn, the total value of dividends granted by Hidroelectrica would amount to over RON 2bn. Hidroelectrica ended last year with an EBITDA of over RON 3bn, at a turnover of RON 4.14bn.

OMV Petrom, dividends accounting for 48% of last year's profit

OMV Petrom, the largest oil and gas producer in Central and South Eastern Europe, will grant shareholders a dividend of RON 0.031/share. The

amount distributed for dividends represents about 48% of the net profit posted last year, of RON 3.6 billion.

"We have maintained our proposal to distribute dividends, despite the pressure our industry is under, in the context of the coronavirus pandemic and the sharp drop in oil prices. The approved dividend reflects the 2019 performance of OMV Petrom. In this difficult period, we maintain our commitments to our shareholders - including the Romanian state," said Christina Verchere, CEO of OMV Petrom.

The account of the Romanian state, which owns a stake of over 20% in OMV Petrom through MEEMA, will be fed with around RON 360mln.

Aggregate divided of RON 7/share at Conpet

Conpet has proposed an aggregate dividend of over RON 7/share, with a net yield of 8.5%. The Ordinary General Meeting of Shareholders at Conpet Ploiesti approved the Board of Directors' proposal to redistribute the net gain of RON 65.32mln obtained by the company last year. Therefore, RON 1.12mln is the reinvested profit, RON 6.40mln will be employee participation in profits and the amount of RON 57.75mln, the equivalent of 88.43% of the net result, will be distributed to shareholders in the form of dividends. The proposed gross dividend, due for payment on June 25, is RON 6.67135515/share. At the same time, the company that ensures pipeline oil transmission in the country will distribute from reserves, also in the form of dividends, the amount of RON 3.3mln. The value of the gross dividend is RON 0.38095632/share. The aggregate dividend is RON 7.0523147/share and, at the latest price on the stock exchange, of RON 78.80/share, it gives shareholders a net yield of 8.5%.

In the first quarter of this year, the operator of the national system for oil, NGL, gasoline and ethane transport through pipelines reported a net profit of RON 16.3mln, up by almost 13% compared to the similar period of last year. The operating income increased by 7.3%, to RON 113.69mln, while expenses went up only 6.7%, to RON 96.6mln. The transported quantities increased by 11%, to RON 1.838 million tons, and the transported oil quantities from domestic production increased only marginally, by 0.5%, to 874,000 tons, those coming from import increasing by almost 23%, to 964,000 tons.

Engie Romania will not distribute dividends, the profit being included in reserves

Engie Romania, formerly GDF Suez Romania, controlled by the homonymous French group and where the Romanian state owns a 37% stake, plans not to distribute dividends to shareholders from the profit posted in 2019, following to be included in reserves as retained earnings, according to a document of the company. Engie Romania last year posted a net profit of RON 335.7mln, down by over 26% compared to 2018 (RON 455.92mln). During 2019 the provisions of GEO No. 114/2018 were applied, according to which Romanian gas producers were forced to sell their production to suppliers to household consumers at the capped price of RON 68/MWh. On the other hand, as of July 1, 2019, ANRE reduced the regulated supply price for population applied by Engie by almost 8%. In the annual report for 2019 of the parent group it is shown that Engie operations in Romania last year recorded a net profit of around EUR 95mln, by 9% higher compared to 2018 (EUR 87mln) and revenues went up by over 16%, to EUR 1.436bn. The proposal to include in reserves the profit obtained in 2019, made by the Board of Directors, must be approved by shareholders in the GMS. The shareholders of Engie Romania are the investment vehicle registered in the Netherlands, Romania Gas Holding BV, controlled by the French group Engie, formerly GDF Suez, with a stake of 51%, the Romanian state through the Ministry of Energy, with almost 37% of the capital and Fondul Proprietatea, with a stake of around 12%. The parent group of Engie has recently announced that it had given up the payment of dividends planned for 2019 and it had withdrawn its estimates on the financial results for this year, due to the coronavirus pandemic (COVID-19),

which would significantly affect the operations and customers of the French energy and utility group. In 2019, Engie Romania distributed to shareholders total dividends of RON 136.77mln, accounting for 30% of the profit posted in the previous year, dividends from which the Romanian state collected over RON 50mln. In 2018, the net profit of Engie Romania was RON 455.92mln, up 35% compared to 2017, mainly as a result of an increase in gas prices, both on the regulated market of household consumers and thermal power plants producing heat for the population and on the competitive market. In the first month of this year, Engie was the largest gas importer in Romania, with a share of over 50%, through Engie Romania (45.69%) and Engie Energy Management Romania (4.69%). Besides Engie Romania, active mainly in gas supply, but also in electricity supply, the French group also controls in Romania Distrigaz Sud Retele (gas distribution), Engie Servicii SRL (services related to gas installations), Braila Winds SRL, Alizeu Eolian SA (renewable energy production) and Engie Building Solutions SRL (installation works and services for industrial customers).

Electrica to grant dividends of RON 246mln

The Ordinary General Meeting of Electrica Shareholders, which took place on April 29, 2020, approved, with the majority of votes expressed, the Board of Directors' proposal regarding the distribution of the net profit related to the financial year of 2019. The total value of the gross dividends will amount to RON 246,108,017, the value of the gross dividend per share will be RON 0.7248 and the date of dividend payment - June 26, 2020. Shareholders also approved the revenue and expenditure budget related to the financial year of 2020 and the annual financial statements for the financial year ended December 31, 2019, both at consolidated level and at individual level. At the same time, the date of June 9, 2020 was set as Record Date, to identify shareholders subject to the OGMS of Electrica, including the right to benefit from dividends.

"In the exceptional circumstances generated by the Covid-19 pandemic, we continue to honor our commitments to both our customers and shareholders. The dividend distribution proposal reflects the company's performance in 2019 and is in line with the dividend yield level with which we have accustomed our shareholders. Electrica remains one of the companies that investors still trust, despite the volatility of the capital market. During this difficult period, we have even noticed the consolidation of the positions of some institutional investors, who traditionally have a medium and long-term investment strategy, in line with the Group's strategy. We constantly monitor the national and international context, as well as the financial performance and liquidity of the Group's companies in order to limit any potential risks, and we are ready to respond, as soon as possible, to the situations generated by the evolution of the crisis," stated Corina Popescu, CEO Electrica SA.

Dividend of RON 1.61/share at Romgaz

Romgaz management has submitted to shareholders a proposal for a gross dividend per share of RON 1.61, of which RON 1.39 related to the result posted in 2019 and RON 0.22 related to retained earnings. The gross dividend of RON 1.61/share will be granted taking into account the fact that: dividends due to shareholders, according to the proposal for the redistribution of the profit related to 2019, amount to RON 535,737,136; dividends due to shareholders, according to the proposal for the redistribution of the retained earnings, amount to RON 84,792,928; dividends are distributed to shareholding proportionally to their shareholding; the company's share capital is RON 385,422,400, split into 385,422,400 ordinary, registered, indivisible shares, with a nominal value of RON 1/unit. The payment of dividends due to shareholders starts on July 24, 2020. The preliminary net profit of Romgaz for 2019 is RON 1.43bn, up 4.55% compared to 2018.

Transgaz to grant dividends worth RON 182.14mln

Shareholders of Transgaz, the operator of the national gas transmission system, approved the distribution of the amount of RON 182.14mln as dividends, the equivalent of 52% of last year's profit, of RON 348.26mln, which means that the dividend per share is RON 15.47. Of the remaining amount, RON 166.11mln will enter the account of own financing sources, while the amount of RON 15.88mln will be distributed for employee participation in profits. The Record Date, which defines shareholders to benefit from dividends, is June 26, while payments will start on July 17 this year.

Dividends of RON 498.4mln at Nuclearelectrica

Nuclearelectrica shareholders approved the distribution of dividends of RON 498.4mln from last year's profit. The total value of gross dividends is RON 498,421,396, the value of the gross dividend per share is RON 1.65306302, and the date of dividend payment is June 25, 2020. The state owns, through the Ministry of Economy, 82.49% stake in Nuclearelectrica, which reported a net profit of RON 540.9mln in 2019, up 31.7% compared to the previous year. Revenues from electricity sale amounted to RON 2,365,563,574 last year, by 11.7% higher than in 2018. The quantity of energy sold was 10,622,086 MWh, similar to that recorded in 2018.

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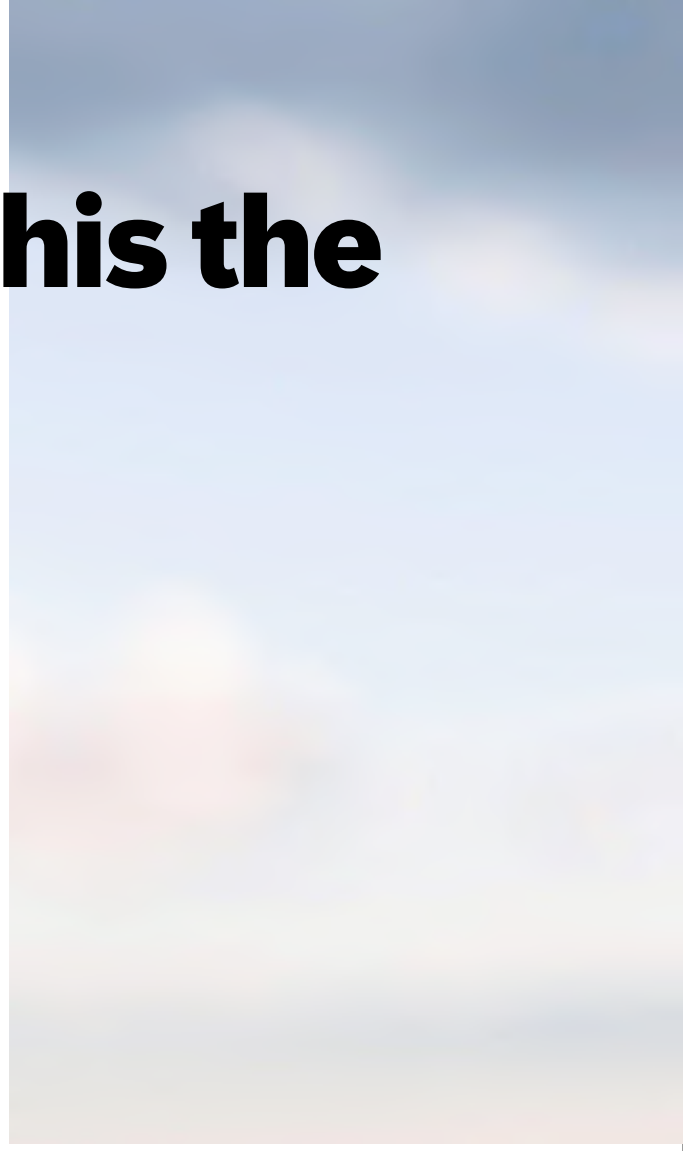
Hydrogen: Is This the Future? (I)



While cataclysmic events in the energy sector are unfolding, the status quo and its king, oil, are being challenged by emerging contesters. Hydrogen has proven to be one of the prime challengers as it seems that it will be playing a very important role in the future. This consensus has been embraced by international energy organizations like IEA (International Energy Agency) and IRENA (International Renewable Energy Agency) and powerful new dynamics are being formed as these words are being typed. Hydrogen seems to offer a unique combination of practicality, scalability and cost effectiveness, providing an answer to the very complicated question of decarbonization. It presents many challenges too.

by **Evgenios Zogopoulos**
Co-author: **Konstantinos Michalopoulos, Dipl. Mining & Metallurgical Engineer at National Technical University of Athens**

The really heavy domains of heavy industry, like manufacturing industry and heavy-duty, long-haul transport, are presenting the biggest challenges regarding the transition towards decarbonization; solar and wind cannot make it by themselves. Bio-gas could potentially help, but faces severe volume limitations and processing complications. One of the few very promising solutions seems to be clean hydrogen, produced from renewable or nuclear power or fossil fuels with carbon capture and storage (CCS).

In this article, broken down in two parts, we are going to examine the momentum and some of the most convincing arguments for Hydrogen and how it could fuel our future.

Momentum

Following the Paris climate agreement, and not only, leading economies throughout the globe are spearheading the initiatives for cleaner fuel. Europe seems to be taking the lead on this. For example, lowered emission standards for vehicles are increasingly popular in many cities and countries. They are a powerful driver of clean hydrogen applications in transport, where diesel and petrol are rapidly becoming less acceptable. Many current

discussions in Europe also involve proposals such as an obligation to blend clean gas and more specifically hydrogen, into the gas grids. This would help the clean hydrogen market in Europe get off the ground really fast.

The unified market is one of Europe's greatest achievements and provides European businesses with a large domestic market with free trade and minimal restrictions. It stimulates competition and trade within the EU and provides EU citizens with a wider choice of goods and services. On top of that, it offers more employment and entrepreneurial opportunities across all domains and sectors. It gives companies the leverage they need to become leaders on the global stage. Nevertheless, Europeans continue to experience some barriers that prevent them from fully reaching the potential of their international domestic. Estimates show that removing these barriers could bring up to EUR 713 billion by the end of the decade. Reports on barriers to the single market identify a broad range of obstacles in the single market taking the perspective of Europe's businesses and consumers. These obstacles mainly have to do with obsolete and archaic national legislative frameworks of some of the EU members that impede progress.

The wide arsenal of initiatives indicates Europe's will to embrace a new approach for its Energy policy, setting the example for the rest of the world. It sets out a range of actions to support all sorts of European stakeholders like corporations of every size (including start-ups), research centres, service providers, suppliers and social partners. Targeted policies for small and medium-sized enterprises (SMEs) aim to reduce obstacles and help Europe's numerous SMEs to do business across the single market and beyond, access financing and help lead the way on the digital and green transitions.

SMEs play a key role in Europe's industrial fabric and are central to the success of this new industrial approach. The Strategy aims to help SMEs to lead the twin transitions, which also means securing access to the right skills. To build SMEs' capacity for these transitions, the Commission will upgrade the European Enterprise Network with dedicated Sustainability Advisors. It will also expand with Digital

Innovation Hubs across Europe to empower SMEs to integrate digital innovative solutions.

The President of the European Commission, Ursula von der Leyen, stated: "Europe's industry is the motor of growth and prosperity in Europe. And it is at its best when it draws on what makes it strong: its people and their ideas, talents, diversity and entrepreneurial spirit. This is more important than ever as Europe embarks on its ambitious green and digital transitions in a more unsettled and unpredictable world. Europe's industry has everything it takes to lead the way and we will do everything we can to support it." Thierry Breton, Commissioner for Internal Market, said: "Europe has the strongest industry in the world. Our companies - big and small - provide us with jobs, prosperity and strategic autonomy. Managing the green and digital transitions and avoiding external dependencies in a new geopolitical context requires radical change - and it needs to start now."

To make it easier for SMEs to operate in the single market and beyond, the Commission proposes actions to remove regulatory and practical obstacles to doing business or scaling up. Among them, the Commission is pursuing to ensure prompt payment, in particular through the new virtual Observatory. To make it easier for SMEs to go public in Europe, the Commission will also support an SME Initial Public Offerings (IPOs) Fund under the InvestEU SME window; this will be a big gamechanger. The ultimate objective is to make Europe one of the best places to start businesses and scale up. It will work with Member States on an EU Start-up Nations Standard to share and adopt best practices to accelerate growth of high-tech SMEs and start-ups. To ensure political commitment for these measures, a high-level EU SME Envoy will guarantee close partnership and coordination with EU Member States through national SME envoys, as well as with regional and local authorities. It will also strengthen the SME perspective in EU legislation.

To maintain and boost Europe's industrial leadership, a new Industrial Strategy will help deliver impact on three key domains:

Maintaining European industry's global competitiveness;

Making Europe climate-neutral by 2050;

Shaping Europe's digital future.

In addition to a comprehensive set of actions, both horizontal and for specific technologies, the Commission will analyse the risks and needs of the different industrial ecosystems. In doing this analysis, the Commission will be working closely with the Industrial Forum, to be set up by September 2020. It will consist of representatives from industry, including SMEs, big companies, start-ups, social partners, researchers, as well as Member States and EU institutions. Industry does evidently play an essential role in supporting Europe's economic growth and prosperity. European industry is a global leader in many sectors representing up to 20% of the total value added of the EU and generating 35 million jobs.

Many European states have already showed tremendous progress launching impactful initiatives.

The Dutch government has announced the broadening of its low-carbon program by pushing its subsidies to turn to renewable energy. This will help the market-driven activation of blue hydrogen projects and, depending on how costs evolve, hopefully that of green hydrogen projects in the near future.

France's hydrogen strategy includes ambitious targets for 'cleaning' the current use of grey hydrogen in industry, the soonest possible. They target 10% green hydrogen use in industry for 2022 and 20% to 40% for 2027.

Germany has been pursuing a very ambitious paradigm shift to an energy system based on renewables – known as the Energiewende – with increased determination since the turn of the century. While in the earlier years the focus was on increasing renewable energy production, recently, the German debate has started to also revolve around the long-term role of hydrogen. Additionally, a proposal from important industry players in the country, like Siemens, aims to organize combined auctions of offshore wind fields for electrolysis, which would imply connecting the value chain in one single bundle.

The government of Romania is set to support the research activity in the field of hydrogen as alternative energy source. Romania has a Memorandum on the establishment of the Romanian HUB for Hydrogen and New Energy Technologies, ROHYDROHUB. The Sustainable Development Department on May 26 organized the event RO-HYDROHUB, hydrogen as an alternative energy vector. "The research activity in the field of hydrogen, as alternative energy source, is of particular importance and, together with the National Institute for Cryogenic and Isotopic Technologies we initiated two actions, so as to amend the Competitiveness Operational Programme and develop the first project applied on this segment - Technological solution of thermal energy supply for rural communities based on hydrogen," Minister of European Funds Marcel Bolos announced. Financing this project could be achieved under the Operational Programme 'Sustainable Development'.

Meanwhile, on the other side of the world, the recent launch of the first liquefied hydrogen carrier vessel in Japan is a historic event that captured headlines in the media Japan's plans for a 'hydrogen-based society' were first introduced in the 4th Strategic Energy Plan of 2014 and further developed in the Strategic Roadmap for Hydrogen and Fuel Cells of 2016. With the Basic Hydrogen Strategy of 2017, Japan was pretty much the first country in the world to release a strategic government plan for hydrogen and fuel cell technology. Just like the first LNG tanker 50 years ago, it may mark the beginning

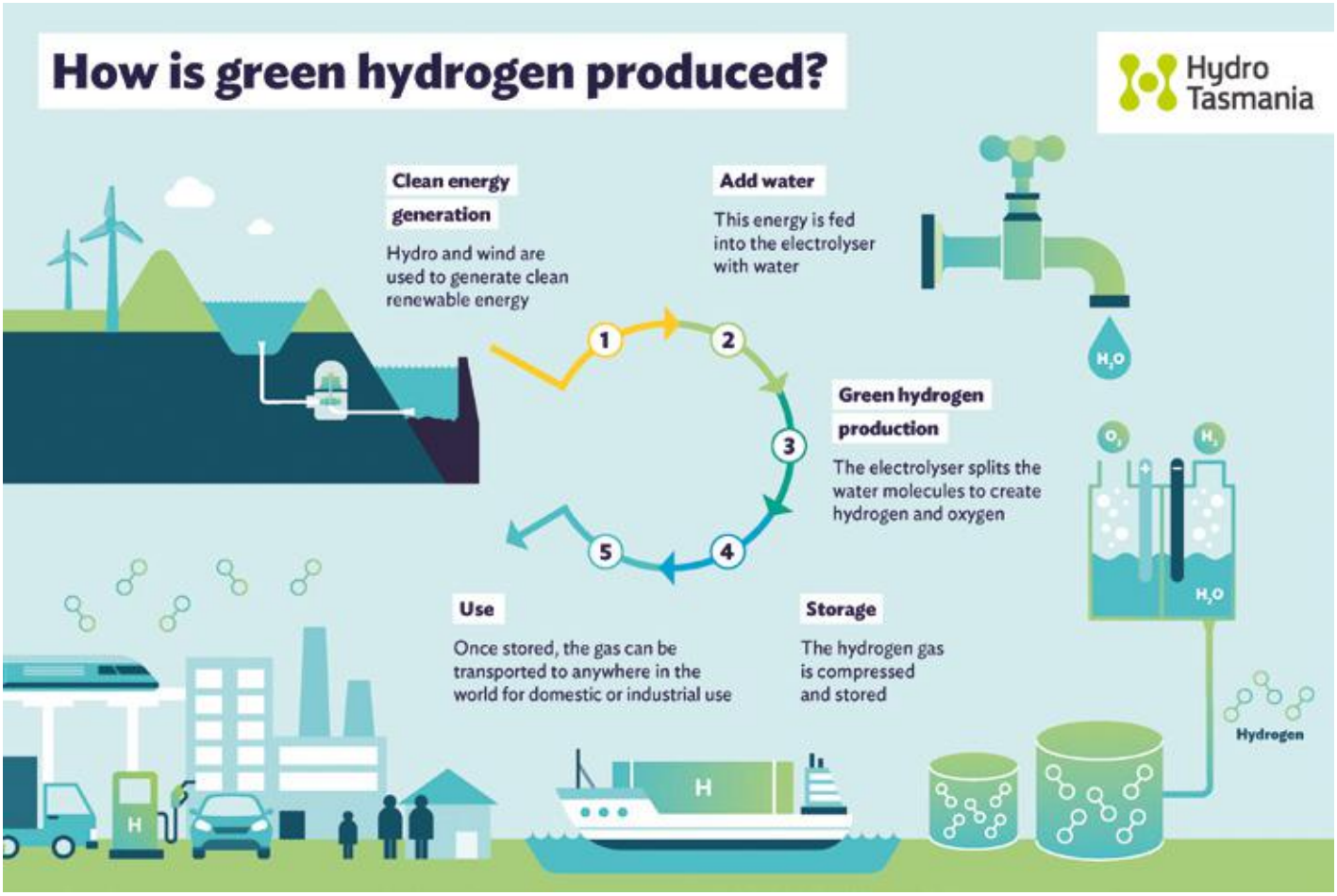
of a new era. And, it is again Japan that leads the way in establishing the first international trade routes for shipping clean hydrogen from Australia and Brunei to Japan.

Hydrogen as fuel

In the modern energy world, the word hydrogen is becoming more and more popular. Hydrogen is a complex word deriving from the name hydrogène ('water producer') and was used from 1787 by the French chemist Antoine Laurent de Lavoisier, from the Greek words 'hydor' (water) and 'genes' (producing Hydrogen - chemical symbol H for the Latin name hydrogenium). Earlier it had been called 'inflammable air' by the English chemist and physicist Henry Cavendish because of its high flammability. The German name 'Wasserstoff' ('water substance') likewise refers to its water producing properties. Hydrogen has the lowest atomic weight of any element, at 1.008 grams per mol (g/mol); atomic hydrogen is 12 times lighter than carbon (C), 14 times lighter than nitrogen (N) and 16 times lighter than oxygen (O).

Space is also full with highly diluted hydrogen and contains enormous gas clouds consisting of hydrogen. Our sun, which is around 4.6 billion years old, is a so-called main sequence star, which releases its radiant energy from hydrogen burning. Hydrogen is also the most frequently occurring chemical element on the giant gas planets (Jupiter, Saturn) of our solar system. Unlike in outer space, the proportion of hydrogen in the elements on Earth is much smaller. The part of the Earth that is accessible to humans makes up less than 1% of the Earth's mass. In the region of the Earth's crust, oceans and atmosphere, the mass fraction of hydrogen is just 0.9% (Mortimer/Müller 2010). The proportion of hydrogen in the Earth's atmosphere is only 0.5 parts per million (ppm).

Moreover, hydrogen occurs in almost all organic compounds. Organic compounds cannot be found only in living creatures. Fossil energy sources also consist primarily of carbon-hydrogen compounds. A very good example is the hydrocarbon methane, the main constituent of natural gas, is made up of one carbon atom and four hydrogen atoms (CH_4). By contrast, in higher alkanes such as petrol and diesel fuel the carbon-hydrogen ratio is around 1:2, and in coal it is only around 1:1. The higher the hydrogen content of a hydrocarbon, the lower the carbon dioxide content and hence the lower the greenhouse gas emissions on combustion (oxidation). In the 1960s, the successful use of hydrogen as a rocket propellant and of fuel cells to operate auxiliary power units in space – especially in the context of the US Saturn/Apollo space travel programme – provided further hype to the fantasies surrounding hydrogen. Also, in the 1960s there were the first passenger cars were fitted with fuel



cells technology as prototypes. Hydrogen has long been regarded as an energy carrier of the future. It is also discussed as the foundation of a sustainable hydrogen economy.

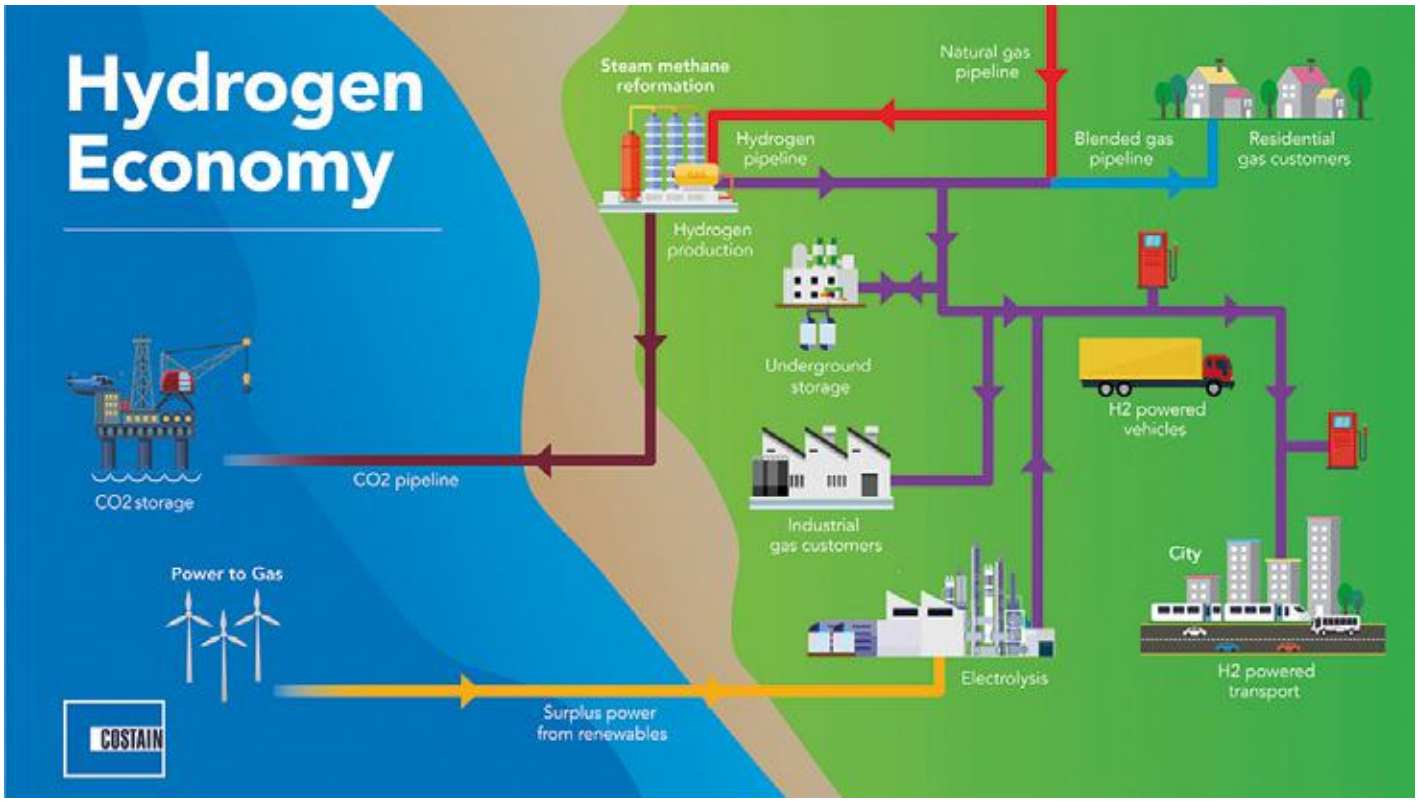
Properties

The most characteristic chemical property of hydrogen is its flammability (Hollemann/Wiberg 2007). When hydrogen is burned in ambient air, the flame is barely visible in daylight, since the flame is characterized by low heat radiation and a high ultraviolet component. In comparison with other fuels, it is striking that hydrogen is combustible in a very broad concentration spectrum. The ignition range of hydrogen, marked by its lower and upper explosive limit, is correspondingly large: the lower limit is at a concentration of 4 vol%, the upper limit at 77 vol%.

Its combustion properties make hydrogen an interesting combustion fuel. If hydrogen were to be used in internal combustion engines, the broad ignition limits would allow for extremely lean air/hydrogen gas mixtures. Lean combustion is more efficient than stoichiometric combustion and thus minimizes fuel consumption. Due to its flammability, when working with hydrogen, an oxyhydrogen gas sample should always be taken or oxygen should only be added to the hydrogen at the moment of ignition (Hollemann/Wiberg 2007). Similar to gas mixtures containing hydrogen and chlorine gas or fluorine, the reaction to hydrogen chloride or hydrogen fluoride can result in explosive exothermic reactions. Its chemical properties make hydrogen an excellent combustion and automotive fuel. Nevertheless, handling hydrogen requires care, and in particular compliance with safety regulations.

The fuel cells

Whereas the 19th Century was the century of the steam engine and the 20th Century was the century of the internal combustion engine, it is likely that the 21st Century will be the century of the fuel cell. Fuel cells are now on the verge of being introduced commercially, revolutionizing the way we produce power. Fuel cells can use hydrogen as a fuel, offering the prospect of supplying the world with clean, sustainable electrical power. We should clarify now that hydrogen is not a primary energy source like



coal and gas. It is an energy carrier. A fuel cell by definition is an electrical cell, which unlike storage cells can be continuously fed with a fuel so that the electrical power output is sustained indefinitely (Connihan, 1981). They convert hydrogen, or hydrogen-containing fuels, directly into electrical energy plus heat through the electrochemical reaction of hydrogen and oxygen into water. The process is that of electrolysis in reverse.

Overall reaction: 2 H2(gas) + O2(gas) → 2 H2O + energy

Because hydrogen and oxygen gases are electrochemically converted into water, fuel cells have many advantages over heat engines. These include high efficiency, virtually silent operation and, if hydrogen is the fuel, there are no pollutant emissions. If the hydrogen is produced from renewable energy sources, then the electrical power produced can be truly sustainable. The two principle reactions in the burning of any hydrocarbon fuel are the formation of water and carbon dioxide. As the hydrogen content in a fuel increases, the formation of water becomes more significant, resulting in proportionally lower emissions of carbon.

For energy applications, fuel cells have become the main focus of hydrogen usage. Fuel cells offer much higher electrical efficiency and overall efficiency than heat engines. The many different cell types now available are distinguished in terms of the electrolytes (ionic conductors) they use and their operating temperature. Low temperature cells allow for a dynamic load response, while high temperature cells favour continuous loads and are more resilient to fluctuations in fuel quality. In addition, after external or internal reforming, some fuel cell types can also use other fuels containing hydrogen (such as natural gas or methanol).

"The fuel cell makes sense when the energy storage required by an application represents many hours of operation at full power. The durability of batteries in this sort of application is at best a few hours. The size, weight, and cost of energy storage for a fuel cell powerplant easily out competes batteries. You do have the fixed cost (and size and weight) of the plant, which is a function of power. This is why it is important to note that the advantage of fuel cells is for low power, high energy applications" (Ric Pow of Pow Consulting, 2001).

Rechargeable batteries will discharge over time; the colder the ambient temperature the quicker they will discharge. Also, the charge capacity of a rechargeable battery decreases with the number of times of charge and discharge. Conversely, providing the hydrogen supply is sealed correctly, a fuel cell will not discharge over time, maintaining its full charge capacity almost indefinitely.

On the next part of the article, we are going to be addressing the applications, distribution challenges and the future of Hydrogen.

European Economic Forecasts

DEEP AND UNEVEN RECESSION, UNCERTAIN RECOVERY

The coronavirus pandemic is a major shock for economies, in the EU and globally, with very serious consequences from a social and economic point of view. Despite the quick and extensive political response, at both EU and national levels, the EU economy will witness this year a recession of historic proportions, the European Commission warns.

According to the economic forecasts from the spring of 2020, in Romania GDP will drop by 6% in 2020, following to grow by 4.2% in 2021. Inflation will reach the value of 2.5% in 2020, being followed by a 3.1% rate in 2021, while unemployment rate will reach 6.5% in 2020 and 5.4% in 2021.

Also, the Eurozone economy will register a record contraction, of 7¾% in 2020, while in 2021 it will witness a 6¼% growth. EU economy is expected to contract by 7½% in 2020 and grow by approximately 6% in 2021. Forecasts in terms of growth for the EU and the Eurozone have been downgraded by approximately nine percentage points compared to the economic forecasts of the autumn of 2019.

The shock felt by the EU economy is symmetrical by the fact that the pandemic has hit all the Member States, but both the decrease in production in 2020 (from -4¼% in Poland to -9¾% in Greece), and the recovery capacity in 2021 will vary significantly from one country to the other. The economic recovery of each Member State will depend not only on the evolution of the pandemic in the respective country, but also on the structure of the economy and the capacity of reaction through stabilization policies. Given the interdependence of economies in the EU, the dynamics of recovery in each Member State will also affect the capacity for recovery of other Member States.

"At this stage, we can only tentatively map out the scale and gravity of the coronavirus shock to our economies. While the immediate fallout will be far more severe for the global economy than the financial crisis, the depth of the impact will depend on the evolution of the pandemic, our ability to safely restart economic activity and to rebound thereafter. This is a symmetric shock: all EU countries are affected and all are expected to have a recession this year. The EU and member states have already agreed on extraordinary measures to mitigate the impact. Our collective recovery will depend on continued strong and coordinated responses at EU and national level. We are stronger together," said Valdis Dombrovskis, Executive Vice President for an Economy that works for People.

"Europe is experiencing an economic shock without precedent since the Great Depression. Both the depth of the recession and the strength of recovery will be uneven, conditioned by the speed at which lockdowns can be lifted, the importance of services like tourism in each economy and by each country's financial resources. Such divergence poses a threat to the single market and the euro area - yet it can be mitigated through decisive, joint European action. We must rise to this challenge," added Paolo Gentiloni, European Commissioner for the Economy.

A large hit to growth, followed by an incomplete recovery

The coronavirus pandemic has seriously affected consumer spending, industrial output,

Table 1:

Overview - the spring 2020 forecast

	Real GDP			Inflation			Unemployment rate			Current account			Budget balance		
	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Belgium	1.4	-7.2	6.7	1.2	0.2	1.3	5.4	7.0	6.6	-0.7	-0.1	-0.3	-1.9	-8.9	-4.2
Germany	0.6	-6.5	5.9	1.4	0.3	1.4	3.2	4.0	3.5	7.6	6.1	7.4	1.4	-7.0	-1.5
Estonia	4.3	-6.9	5.9	2.3	0.7	1.7	4.4	9.2	6.5	2.3	1.1	2.2	-0.3	-8.3	-3.4
Ireland	5.5	-7.9	6.1	0.9	-0.3	0.9	5.0	7.4	7.0	-9.4	4.6	4.4	0.4	-5.6	-2.9
Greece	1.9	-9.7	7.9	0.5	-0.6	0.5	17.3	19.9	16.8	-0.3	0.1	-1.2	1.5	-6.4	-2.1
Spain	2.0	-9.4	7.0	0.8	0.0	1.0	14.1	18.9	17.0	2.0	3.2	2.7	-2.8	-10.1	-6.7
France	1.3	-8.2	7.4	1.3	0.4	0.9	8.5	10.1	9.7	-0.1	-0.1	-0.4	-3.0	-9.9	-4.0
Italy	0.3	-9.5	6.5	0.6	-0.3	0.7	10.0	11.8	10.7	3.0	3.4	3.3	-1.6	-11.1	-5.6
Cyprus	3.2	-7.4	6.1	0.5	-0.2	1.0	7.1	8.6	7.5	-5.7	-10.9	-10.1	1.7	-7.0	-1.8
Latvia	2.2	-7.0	6.4	2.7	0.2	1.9	6.3	8.6	8.3	0.6	1.1	1.2	-0.2	-7.3	-4.5
Lithuania	3.9	-7.9	7.4	2.2	0.8	1.5	6.3	9.7	7.9	3.5	2.2	2.9	0.3	-6.9	-2.7
Luxembourg	2.3	-5.4	5.7	1.6	0.7	1.6	5.6	6.4	6.1	4.5	4.5	4.5	2.2	-4.8	0.1
Malta	4.4	-5.8	6.0	1.5	0.7	1.1	3.4	5.9	4.4	10.7	7.6	9.7	0.5	-6.7	-2.5
Netherlands	1.8	-6.8	5.0	2.7	0.8	1.3	3.4	5.9	5.3	10.2	9.0	8.4	1.7	-6.3	-3.5
Austria	1.6	-5.5	5.0	1.5	1.1	1.5	4.5	5.8	4.9	2.3	0.9	1.6	0.7	-6.1	-1.9
Portugal	2.2	-6.8	5.8	0.3	-0.2	1.2	6.5	9.7	7.4	0.0	-0.6	-0.2	0.2	-6.5	-1.8
Slovenia	2.4	-7.0	6.7	1.7	0.5	1.2	4.5	7.0	5.1	6.8	6.8	6.8	0.5	-7.2	-2.1
Slovakia	2.3	-6.7	6.6	2.8	1.9	1.1	5.8	8.8	7.1	-2.6	-2.9	-2.4	-1.3	-8.5	-4.2
Finland	1.0	-6.3	3.7	1.1	0.5	1.4	6.7	8.3	7.7	-0.8	-1.3	-1.5	-1.1	-7.4	-3.4
Euro area	**1.2**	**-7.7**	**6.3**	**1.2**	**0.2**	**1.1**	**7.5**	**9.6**	**8.6**	**3.3**	**3.4**	**3.6**	**-0.6**	**-8.5**	**-3.5**
Bulgaria	3.4	-7.2	6.0	2.5	1.1	1.1	4.2	7.0	5.8	5.2	3.3	5.4	2.1	-2.8	-1.8
Czechia	2.6	-6.2	5.0	2.6	2.3	1.9	2.0	5.0	4.2	0.7	-1.5	-1.0	0.3	-6.7	-4.0
Denmark	2.4	-5.9	5.1	0.7	0.3	1.3	5.0	6.4	5.7	7.9	6.2	6.7	3.7	-7.2	-2.3
Croatia	2.9	-9.1	7.5	0.8	0.4	0.9	6.6	10.2	7.4	2.4	-1.7	0.5	0.4	-7.1	-2.2
Hungary	4.9	-7.0	6.0	3.4	3.0	2.7	3.4	7.0	6.1	-0.9	1.3	1.5	-2.0	-5.2	-4.0
Poland	4.1	-4.3	4.1	2.1	2.5	2.8	3.3	7.5	5.3	0.4	0.6	0.9	-0.7	-9.5	-3.8
Romania	4.1	-6.0	4.2	3.9	2.5	3.1	3.9	6.5	5.4	-4.6	-3.3	-3.4	-4.3	-9.2	-11.4
Sweden	1.2	-6.1	4.3	1.7	0.4	1.1	6.8	9.7	9.3	4.4	3.7	4.0	0.5	-5.6	-2.2
EU	**1.5**	**-7.4**	**6.1**	**1.4**	**0.6**	**1.3**	**6.7**	**9.0**	**7.9**	**3.2**	**3.1**	**3.4**	**-0.6**	**-8.3**	**-3.6**
United Kingdom	1.4	-8.3	6.0	1.8	1.2	2.1	3.8	6.7	6.0	-3.8	-4.1	-4.3	-2.1	-10.5	-6.7
China	6.1	1.0	7.8	:	:	:	:	:	:	1.0	0.6	0.8	:	:	:
Japan	0.7	-5.0	2.7	0.5	0.0	0.2	2.3	4.3	4.5	3.5	3.6	3.2	-2.3	-4.9	-5.3
United States	2.3	-6.5	4.9	1.8	0.5	1.5	3.7	9.2	7.6	-2.3	-3.0	-3.0	-7.2	-17.8	-8.5
World	2.9	-3.5	5.2	:	:	:	:	:	:	:	:	:	:	:	:

investment, trade, capital flows and supply chains. The announced progressive relaxation of containment measures should pave the way for recovery. However, no recovery is expected from losses suffered this year by the EU economy before the end of 2021. Investments will remain modest and the labour market will not recover entirely.

Keeping efficient policy measure at EU level and at national level in response to the crisis will be crucial to limit the economic damage and to facilitate a swift, robust recovery to set the economies on the path of sustainable and inclusive growth.

Unemployment is expected to increase, although the measures adopted should limit its growth

Although the unemployment systems partially, salary subsidies and support granted to enterprises should contribute to limit losses of jobs, the coronavirus pandemic will have serious consequences on the labour market.

In the Eurozone, the unemployment rate is forecast to rise from 7.5% in 2019 to 9½% in 2020 before declining again to 8½% in 2021. In the EU, the unemployment rate is forecast to rise from 6.7% in 2019 to 9% in 2020 and then fall to around 8% in 2021.

Some Member States will see more significant increases in unemployment than others. Those with a high share of works with short-term contracts and those where a large part of the labour force depends on tourism are particularly vulnerable. Young people entering the labour market at this time will also find it harder to secure their first job.

A steep drop in inflation

This year consumer prices are expected to fall significantly amid the drop in demand and the strong decline of oil prices,

Table I.2.5:

Labour market outlook - euro area and EU

(Annual percentage change)	Euro area							EU						
	Spring 2020 forecast				*Autumn 2019 forecast*			Spring 2020 forecast				*Autumn 2019 forecast*		
	2018	2019	2020	2021	2019	2020	2021	2018	2019	2020	2021	2019	2020	2021
Population of working age (15-64)	0.2	**0.2**	**0.2**	**0.2**	*0.2*	*0.2*	*0.2*	0.1	**0.1**	**0.1**	**0.1**	*0.1*	*0.1*	*0.1*
Labour force	0.5	**0.5**	**0.1**	**0.4**	*0.4*	*0.3*	*0.3*	0.4	**0.4**	**0.1**	**0.3**	*0.3*	*0.3*	*0.3*
Employment	1.5	**1.2**	**-4.7**	**3.9**	*1.1*	*0.5*	*0.5*	1.4	**1.0**	**-4.4**	**3.3**	*1.0*	*0.4*	*0.4*
Employment (change in million)	2.3	**1.8**	**-7.2**	**5.7**	*1.7*	*0.8*	*0.7*	2.7	**2.0**	**-8.9**	**6.3**	*2.0*	*0.9*	*0.8*
Unemployment (levels in millions)	13.4	**12.4**	**16.0**	**14.4**	*12.4*	*12.2*	*12.0*	15.5	**14.4**	**19.6**	**17.3**	*14.4*	*14.2*	*14.0*
Unemployment rate (% of labour force)	8.1	**7.5**	**9.6**	**8.6**	*7.6*	*7.4*	*7.3*	7.2	**6.7**	**9.0**	**7.9**	*6.8*	*6.7*	*6.5*
Labour productivity, whole economy	0.4	**0.1**	**-3.2**	**2.4**	*0.0*	*0.7*	*0.8*	0.7	**0.5**	**-3.2**	**2.7**	*0.4*	*0.9*	*1.0*
Employment rate (a)	62.0	**62.6**	**61.2**	**61.9**	*62.6*	*62.7*	*62.9*	61.6	**62.1**	**60.6**	**61.4**	*62.1*	*62.3*	*62.5*

(a) As a percentage of population of working age. Definition according to structural indicators. See also note 6 in the Statistical Annex

which, together, should fully offset the isolated increases in prices determined by pandemic-related supply disruptions.

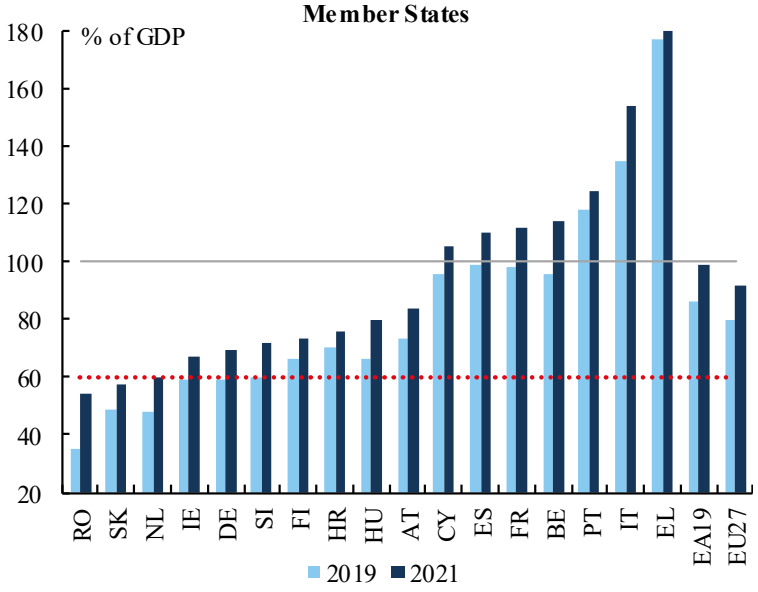
Inflation in the Eurozone, as measured by the Harmonized Index of Consumer Prices (HICP), is now forecast at 0.2% in 2020 and 1.1% in 2021. For the EU, inflation is forecast at 0.6% in 2020 and 1.3% in 2021.

Decisive measures applied will cause public deficits and debt to rise

Member States have reacted decisively through budget measures to limit the economic damages caused by the pandemic. The 'automatic stabilizers', including social security benefit payments, together with the discretionary budget measures are set to cause spending to rise. Therefore, the aggregate government deficit of the euro area and the EU is expected to surge from just 0.6% of GDP in 2019 to around 8½% in 2020, before falling back to around 3½% in 2021.

After having been on a declining trend since 2014, the public debt-to-GDP ratio is also set to rise. In the Eurozone, it is forecast to increase from 86% in 2019 to 102¾% in 2020 and to decrease to 98¾% in 2021. In the EU, the debt ratio is forecast to rise from 79.4% in 2019 to around 95% this year before decreasing to 92% next year.

Graph I.2.29: **Public debt development in selected Member States**



Unusually high uncertainty and risks of negative evolution

Spring forecasts are marked by a greater degree of uncertainty than usual. They are based on a set of assumptions regarding the evolution of the coronavirus pandemic and the related containment measures. The baseline scenario starts from the assumption that, as of May, these measures will be gradually relaxed.

The risks surrounding this forecast are also exceptionally large and concentrated on the downside.

A more severe and longer lasting pandemic than currently expected could cause the GDP to fall much more than assumed in the baseline scenario of this forecast. In absence of a common firm and swift response at EU level, there is a risk that the crisis will cause serious distortions within the Single Market and entrenched economic, financial and social divergences between Eurozone Member States. There is also a risk that the pandemic will trigger more drastic and permanent changes of attitudes

Table I.2.7:

General Government budgetary position - euro area and EU

(% of GDP)	Euro area							EU						
	Spring 2020 forecast				Autumn 2019 forecast			Spring 2020 forecast				Autumn 2019 forecast		
	2018	2019	2020	2021	2019	2020	2021	2018	2019	2020	2021	2019	2020	2021
Total receipts (1)	46.5	**46.5**	**46.7**	**46.3**	46.3	46.2	45.9	46.2	**46.2**	**46.4**	**46.0**	46.0	45.9	45.6
Total expenditure (2)	47.0	**47.1**	**55.2**	**49.9**	47.1	47.1	47.0	46.6	**46.7**	**54.7**	**49.6**	46.8	46.7	46.6
Actual balance (3) = (1)-(2)	-0.5	**-0.6**	**-8.5**	**-3.5**	-0.8	-0.9	-1.0	-0.4	**-0.6**	**-8.3**	**-3.6**	-0.7	-0.8	-1.0
Interest expenditure (4)	1.8	**1.6**	**1.7**	**1.6**	1.7	1.5	1.4	1.7	**1.5**	**1.6**	**1.5**	1.6	1.5	1.4
Primary balance (5) = (3)+(4)	1.4	**1.0**	**-6.8**	**-2.0**	0.9	0.6	0.4	1.3	**1.0**	**-6.7**	**-2.1**	0.9	0.6	0.3
Cyclically-adjusted budget balance (a)	-1.1	**-1.3**	**-4.4**	**-2.1**	-1.1	-1.1	-1.2	-1.1	**-1.2**	**-4.4**	**-2.1**	-1.1	-1.1	-1.2
Cyclically-adjusted primary balance (a)	0.7	**0.4**	**-2.7**	**-0.5**	0.6	0.4	0.2	0.6	**0.3**	**-2.8**	**-0.6**	0.5	0.4	0.2
Structural budget balance (a)	-1.0	**-1.1**	**-4.4**	**-2.1**	-0.9	-1.1	-1.2	-1.0	**-1.1**	**-4.4**	**-2.1**	-0.9	-1.1	-1.2
Change in structural budget balance (a)	0.2	**-0.1**	**-3.3**	**2.3**	-0.1	-0.2	-0.1	0.1	**-0.1**	**-3.3**	**2.3**	-0.2	-0.2	-0.1
Gross debt	87.8	**86.0**	**102.7**	**98.8**	86.4	85.1	84.1	81.3	**79.4**	**95.1**	**92.0**	79.8	78.4	77.4

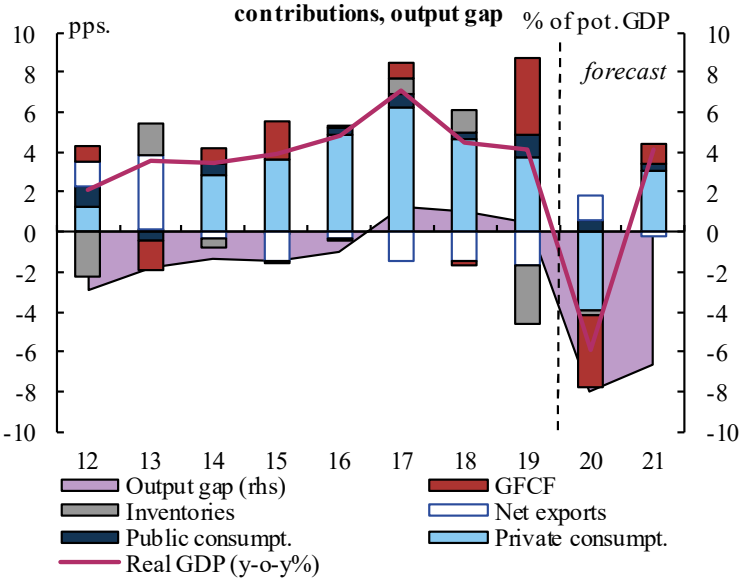
(a) as a % of potential output. The structural budget balance is the cyclically-adjusted budget balance net of one-off and other temporary measures estimated by the European Commission.

towards the global value chains and international cooperation, which would affect the European economy, very open and interconnected. At the same time, the pandemic would leave permanent scars through bankruptcies and long-term damage to the labour market.

Romania – challenges and prospects

Real GDP is projected to decline sharply in 2020, after several years of robust growth. Private consumption, the main driver of growth in recent years, is expected to be impacted severely by the lockdown measures. Uncertainty is expected to hurt investment decisions, while net exports are projected to contribute positively to growth. Unemployment is set to increase while inflation is forecast to ease due to the drop in oil prices. In 2021, real GDP is projected to rebound, though not to pre-crisis levels. The budget deficit is projected to increase significantly as the fiscal measures required to fight the COVID-19 crisis come on top of past fiscal slippages.

Graph II.26.1: **Romania - Real GDP growth and contributions, output gap**



Sharp output drop followed by a moderate recovery

At the onset of the COVID-19 crisis Romania's economy was growing at an annual rate of around 4%, mainly driven by private consumption.

However, signs of macro-economic imbalances had already emerged, notably in the form of high and growing current account and fiscal deficits.

Romania declared a state of emergency on 16 March and subsequently extended it until mid-May. Containment measures are expected to significantly affect services and manufacturing. To counter the negative impact of the crisis, the government adopted measures aimed at supporting consumers and businesses, such as loan guarantees for SMEs, temporary moratoriums on loan servicing, and technical unemployment schemes.

Real GDP is projected to contract by 6% in 2020 and rebound by 4¼% in 2021. Private consumption, which is expected to be significantly affected by lockdown measures in 2020, should increase gradually as these are lifted and contribute positively to growth in 2021. After a very strong performance in 2019, investment is projected to drop significantly in 2020, as businesses react to the very uncertain environment by postponing or cancelling investment projects. Public investment activity, meanwhile, is projected to be subdued. In 2021, investment is expected to recover only partially amid persistent uncertainty.

Main features of country forecast - ROMANIA

	2018		00-15	Annual percentage change					
	bn RON	Curr. prices	% GDP		2016	2017	2018	2019	2020	2021
GDP		952.4	100.0	3.7	4.8	7.1	4.4	**4.1**	**-6.0**	**4.2**
Private Consumption		604.6	63.5	5.3	7.9	10.0	7.3	**5.9**	**-6.2**	**4.9**
Public Consumption		159.6	16.8	-0.5	2.2	4.2	2.1	**6.4**	**3.4**	**1.4**
Gross fixed capital formation		199.7	21.0	6.7	-0.2	3.6	-1.2	**18.2**	**-15.0**	**5.0**
of which: equipment		75.5	7.9	5.6	-8.9	-9.9	4.3	**17.8**	**-22.1**	**7.2**
Exports (goods and services)		396.1	41.6	8.7	16.0	7.6	6.2	**4.6**	**-12.8**	**9.9**
Imports (goods and services)		424.6	44.6	11.2	16.5	10.8	9.1	**8.0**	**-14.4**	**9.8**
GNI (GDP deflator)		932.8	97.9	3.7	4.5	7.5	4.4	**5.0**	**-5.9**	**4.0**
Contribution to GDP growth:	Domestic demand			5.5	5.1	7.7	4.7	**8.7**	**-6.9**	**4.4**
	Inventories			-0.1	0.0	0.8	1.2	**-2.9**	**-0.3**	**0.0**
	Net exports			-1.6	-0.3	-1.4	-1.4	**-1.7**	**1.2**	**-0.3**
Employment				-1.5	-1.1	2.4	0.2	**-0.1**	**-2.5**	**0.6**
Unemployment rate (a)				7.1	5.9	4.9	4.2	**3.9**	**6.5**	**5.4**
Compensation of employees / head				16.6	15.0	14.8	13.4	**8.9**	**2.6**	**4.8**
Unit labour costs whole economy				10.8	8.5	9.8	8.8	**4.5**	**6.4**	**1.3**
Real unit labour cost				-2.0	5.9	4.9	2.4	**-2.2**	**4.0**	**-1.2**
Saving rate of households (b)				-9.0	-9.3	-7.3	-2.3	**-2.5**	**6.9**	**9.5**
GDP deflator				13.1	2.5	4.7	6.3	**6.9**	**2.3**	**2.5**
Harmonised index of consumer prices				10.9	-1.1	1.1	4.1	**3.9**	**2.5**	**3.1**
Terms of trade goods				2.5	-1.7	-2.4	1.3	**1.0**	**-0.5**	**0.5**
Trade balance (goods) (c)				-10.4	-5.5	-6.5	-7.3	**-7.8**	**-6.6**	**-6.6**
Current-account balance (c)				-5.9	-2.0	-3.4	-4.4	**-4.6**	**-3.3**	**-3.4**
Net lending (+) or borrowing (-) vis-a-vis ROW (c)				-4.9	0.5	-1.8	-3.2	**-3.1**	**-1.7**	**-1.7**
General government balance (c)				-3.3	-2.6	-2.6	-2.9	**-4.3**	**-9.2**	**-11.4**
Cyclically-adjusted budget balance (d)				-3.4	-2.3	-3.0	-3.3	**-4.4**	**-6.7**	**-9.2**
Structural budget balance (d)				-	-1.9	-3.0	-2.9	**-4.3**	**-6.7**	**-9.2**
General government gross debt (c)				25.2	37.3	35.1	34.7	**35.2**	**46.2**	**54.7**

(a) as % of total labour force. (b) gross saving divided by adjusted gross disposable income. (c) as a % of GDP. (d) as a % of potential GDP.

Exports are also set to contract in 2020, reflecting the economic contraction in Romania's main trading partners and supply chain disruptions.

They should resume growth in 2021 as global economic activity gradually picks up. Imports are also set to decline, as domestic demand drops and as production in other countries is affected by lockdowns and supply chain disruptions. Overall, the contribution of net exports to growth in 2020 is set to turn positive and result in a lower current account deficit. However, this positive evolution is expected to start reversing in 2021.

From a record low of 3.9% in 2019, the unemployment rate is projected to increase to 6½% in 2020 as some firms will inevitably close as a result of the COVID-19 crisis, although policy measures are expected to limit job losses. Nominal wages are projected to increase only moderately in 2020 after several years of double-digit growth and remain relatively subdued in 2021.

Inflation is projected to fall to 2.5% in 2020 mainly due to the sharp fall in oil prices. Core inflation is projected to ease somewhat but remain above 3% in 2020 and 2021. In response to the COVID-19 crisis, the National Bank of Romania cut its key monetary policy rate from 2.5% to 2% and started purchasing RON-denominated government securities on the secondary market in order to support the financing of the real economy and the public sector.

Downside risks to the growth forecast

The current projections are subject to a particularly high degree of uncertainty. Beyond the uncertainty that affects all countries related to the evolution of the health crisis, global growth and international trade, for Romania it will be important how the authorities balance the need for support measures with concerns about the medium-term trajectory of public finances which pre-dated the COVID-19 crisis.

Public deficit set to increase

In 2019, the general government deficit rose to 4.3% of GDP from 2.9% in 2018. The increase was

Table 42: Gross debt, general government (as a percentage of GDP, 2001-2021) 23.4.2020

	5-year averages						Spring 2020 forecast			Autumn 2019 forecast		
	2001-05	2006-10	2011-15	2016	2017	2018	2019	2020	2021	2019	2020	2021
Belgium	101.5	94.5	105.2	104.9	101.7	99.8	**98.6**	**113.8**	**110.0**	*99.5*	*99.6*	*100.0*
Germany	62.7	70.3	77.5	69.2	65.3	61.9	**59.8**	**75.6**	**71.8**	*59.2*	*56.8*	*55.0*
Estonia	5.2	5.3	9.3	10.2	9.3	8.4	**8.4**	**20.7**	**22.6**	*8.7*	*8.4*	*8.2*
Ireland	29.6	47.5	106.4	73.8	67.7	63.5	**58.8**	**66.4**	**66.7**	*59.0*	*53.9*	*52.6*
Greece	104.7	117.8	172.8	178.5	176.2	181.2	**176.6**	**196.4**	**182.6**	*175.2*	*169.3*	*163.1*
Spain	48.2	45.7	90.4	99.2	98.6	97.6	**95.5**	**115.6**	**113.7**	*96.7*	*96.6*	*96.0*
France	63.3	73.2	92.5	98.0	98.3	98.1	**98.1**	**116.5**	**111.9**	*98.9*	*98.9*	*99.2*
Italy	106.5	110.5	129.9	134.8	134.1	134.8	**134.8**	**158.9**	**153.6**	*136.2*	*136.8*	*137.4*
Cyprus	62.0	53.9	93.4	103.4	93.9	100.6	**95.5**	**115.7**	**105.0**	*93.8*	*87.8*	*81.8*
Latvia	13.5	24.4	41.1	40.9	39.3	37.2	**36.9**	**43.1**	**43.7**	*36.0*	*35.2*	*32.9*
Lithuania	20.3	22.4	39.8	39.7	39.1	33.8	**36.3**	**48.5**	**48.4**	*36.3*	*35.1*	*34.8*
Luxembourg	7.7	13.6	21.9	20.1	22.3	21.0	**22.1**	**26.4**	**25.7**	*19.6*	*19.2*	*18.6*
Malta	67.9	64.9	65.5	55.5	50.3	45.6	**43.1**	**50.7**	**50.8**	*43.3*	*41.0*	*38.7*
Netherlands	49.7	51.8	65.6	61.9	56.9	52.4	**48.6**	**62.1**	**57.6**	*48.9*	*47.1*	*45.6*
Austria	66.6	72.7	82.9	82.9	78.3	74.0	**70.4**	**78.8**	**75.8**	*69.9*	*67.2*	*64.6*
Portugal	64.1	82.0	127.8	131.5	126.1	122.0	**117.7**	**131.6**	**124.4**	*119.5*	*117.1*	*113.7*
Slovenia	26.7	28.7	66.6	78.7	74.1	70.4	**66.1**	**83.7**	**79.9**	*66.7*	*63.1*	*59.5*
Slovakia	43.2	33.5	51.1	52.0	51.3	49.4	**48.0**	**59.5**	**59.9**	*48.1*	*47.3*	*46.9*
Finland	41.3	38.6	56.3	63.2	61.3	59.6	**59.4**	**69.4**	**69.6**	*59.2*	*59.3*	*59.8*
Euro area	69.0	74.0	92.8	92.2	89.8	87.8	**86.0**	**102.7**	**98.8**	*86.4*	*85.1*	*84.1*
Bulgaria	44.2	15.9	20.4	29.3	25.3	22.3	**20.4**	**25.5**	**25.4**	*21.1*	*19.9*	*18.6*
Czechia	26.7	30.9	42.3	36.8	34.7	32.6	**30.8**	**38.7**	**39.9**	*31.5*	*30.7*	*30.1*
Denmark	45.1	35.0	43.8	37.2	35.8	33.9	**33.2**	**44.7**	**44.6**	*33.0*	*32.3*	*31.7*
Croatia	38.6	44.4	76.9	80.8	77.8	74.7	**73.2**	**88.6**	**83.4**	*71.2*	*67.7*	*64.4*
Hungary	57.1	72.2	77.9	75.5	72.9	70.2	**66.3**	**75.0**	**73.5**	*68.2*	*66.7*	*64.4*
Poland	43.5	48.4	53.3	54.3	50.6	48.8	**46.0**	**58.5**	**58.3**	*47.4*	*45.5*	*44.3*
Romania	21.5	17.6	37.1	37.3	35.1	34.7	**35.2**	**46.2**	**54.7**	*35.5*	*37.2*	*40.6*
Sweden	49.9	39.9	40.9	42.2	40.8	38.8	**35.1**	**42.6**	**42.5**	*34.6*	*33.4*	*32.0*
EU	66.3	69.7	86.5	85.8	83.3	81.3	**79.4**	**95.1**	**92.0**	*80.6*	*79.4*	*78.4*
P.M.: United Kingdom	*36.3*	*53.8*	*84.1*	*86.8*	*86.2*	*85.7*	***85.4***	***102.1***	***101.5***	*85.2*	*84.7*	*84.2*

driven by higher current expenditure, in particular on public wages. Additionally, public investment rebounded from the very low levels of previous years.

The general government deficit is forecast to increase to around 9¼% of GDP in 2020. The preexisting expansionary trend largely driven by pension increases is set to be reinforced by the impact of the COVID-19 crisis. Expenditure on old-age pensions is set to rise considerably, driven by the full-year effect of the 15% pension increase that came into effect in September 2019 and a further increase of 40% scheduled for September 2020. COVID-19 related measures in the 2020 budget amendment amount to 1.3 pp of GDP of additional spending, out of which 0.4 pp of GDP financed by EU transfers. They include in particular the technical unemployment benefit and emergency spending. Tax revenues are set to be negatively affected by the recession.

The general government deficit is set to further increase in 2021 to around 11½% of GDP under a no-policy-change assumption, despite a projected recovery in tax revenues and phasing out of pandemic-relief related expenditures. This is due to the full-year effect of the 40% increase in pensions in September 2020, an additional upward pension recalculation scheduled for September 2021, and the doubling of child allowance payments.

The debt-to-GDP ratio is forecast to rise from 35.2% in 2019 to around 54¾% in 2022.

Background

The European Commission forecast is based on a set of technical assumptions concerning exchange rates, interest rates and commodity prices, based on information available until April 23. For all other data integrated in forecast, including assumptions about government policies, this forecast takes into consideration information up until and including 22 April. Unless policies are credibly announced and specified in adequate detail, the projections start from the assumption that nothing changes at the level of policies.

The European Commission publishes two comprehensive forecasts (spring and autumn) and two interim forecasts (winter and summer) each year. The interim forecasts cover annual and quarterly GDP and inflation for the current and following year for all Member States, as well as EU and Eurozone aggregates.

The European Commission's next economic forecast will be the Summer 2020 Interim Economic Forecast which is scheduled to be published in July 2020. This will cover only GDP growth and inflation. The next full forecast will be in November 2020. ■

New Mobile Scanning Solution

Brother, one of the largest providers of solutions for the business environment, has presented a new range of mobile scanning equipment, ideal for the quick digitization of documents during travels, far from the complex computing technology of the office.

***by* Daniel Lazar**

The modern computing technique has provided the solution for this dilemma, offering the possibility to digitize documents, for their facile archiving, inventory and accessibility. In parallel however, the degree of user mobility has increased significantly, which determined an increasing demand for portable equipment. To help these users, in growing numbers, Brother has created the DS series of mobile scanners, designed for those who work a lot on the field. Now the producer announces a renewal of the range, by introducing three new models: DS-940DW, DS-740D and DS-640.

The new equipment stands out for its ergonomic design and ease of use, as well as its compact format. Thus, it can be easily transported anywhere and can be operated by any category of users, whether they are sales people, employees in logistics or in the medical field. And flexibility is extended by the variety of media that can be scanned, from A4 paper documents to plastic ID cards. At the same time, the performance is top notch, with the scanning speed reaching up to 15PPM at 300DPI resolution, due to the ultra-performance rollers of the new models.

Once scanned, documents can be saved in a folder on a PC or sent as an e-mail attachment. All models come with a USB 3.0 connection for power supply and data transfer and include the Kofax PDF software solution, which allows users to easily convert, edit and share the scanned documents.

At the time of scanning, users have several options available: Scan to Email, Scan OCR, Scan to File and Scan to Image. Additionally, DS-940DW is equipped with a rechargeable battery, microSD card slot and Wi-Fi interface. In this way, the model benefits from full autonomy in use, the scanned documents being stored on the card, from where they can be accessed and shared using a mobile device on which the dedicated Brother iPrint & Scan application has been installed. Also, the DS-940DW and DS-740D allow two-sided scanning, while the top the range also provides support for the automatic scanning start function.

The new range of Brother mobile scanners changes the way we work with documents and improve the efficiency of the entire professional activity, these being available on the Romanian market starting with April.

About Brother

Brother is one of the largest developers of printing and communication technologies. In the market segment of monochrome laser multifunction equipment, Brother has become the traditional market leader in Europe. The company was founded in Japan in 1908 and has been present in Europe for 62 years. Worldwide, Brother has more than 37,000 employees. Brother products are based on proprietary technology that is developed, produced and distributed 100% in-house. Brother holds a number of internationally renowned certifications such as 'der Blauer Engel' and 'Ecomark'.

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