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ALESSANDRO BRAGONZI
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We Are Not Alone on the Path to Green Transformation

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Dear readers,

The first issue dedicated to renewable energy sources (RES) appeared on our website precisely six years ago. At the time, we mostly wrote about the pioneers who built renewable power plants, our RES potential, and our capacity-building instruments to generate cleaner energy.

Today, you have before you a new issue of the Magazine whose main topic is, again, RES. However, everything else is entirely different.

The current global situation and the energy crisis, the scale of which, as they warn us, we have not yet felt, have changed our way of thinking and approach to this burning topic, not only in our country but the whole world. The focus is on RES power plants, especially solar power plants, which was contributed by the change in the price of electricity in the economy, state subsidies for citizens, and grants provided by the EBRD through the GEFF program.

Unsurprisingly, an extra place was sought at the Conference on energy transition that Confindustria Serbia organized. You can read more about how the energy transition can improve the competitiveness of companies in this issue. We also attended the fourth conference, "Energy efficiency through the use of solar energy and biomass", organized by the National Association for Biomass "SERBIO", which, among other things, discussed solar power plants and how to become a prosumer.

The energy crisis brings many challenges, and we have given a short retrospective of the "struggle" led by the Ministry of Mining and Energy for our country to preserve energy stability and even make progress in that regard. Apart from the Government, banks are also trying to encourage investments in the RES sector with their offer. Alessandro Bragonzi, Head of the EIB's regional office for the Western Balkans, talks about the bank's plans for the region but also about what they are currently working on in Serbia.

Francesco Corbo, Regional Head Energy Europe for Western Balkans and Croatia at EBRD, spoke for our Magazine about EBRD's investments in Serbia, then funds that help with the transition to green energy and renewable energy projects.

Speaking of the sun, the company MT-KOMEX, which recognized the importance of solar energy nine years ago and built the first solar power plant in Serbia in Kladovo, has positioned itself as a market leader. Their story, with a special emphasis on the benefits of building a solar power plant, as well as a text about the best panels for installation from the point of view of the renowned manufacturer Luxor Solar, can be found on the following pages.

Clearly, saving electricity is a priority. Milan Jevremović, Local Business Manager, Motion at ABB Serbia, presents an "Energy efficiency movement" that aims to turn energy efficiency into a global movement.

And we must not forget the development of electromobility and charger networks for electric vehicles. You can find out where you can find chargers for e-powered vehicles in the article about charge&GO, which also offers chargers from the renowned company Schneider Electric.

Finally, read about the "ecological airplane flight" of KLM, what active houses are, and how robots actively help in teaching.

Nevena Đukić
Editor-in-Chief

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How to Create Favorable Environment for Investment and Innovation?

Since 2001, the EBRD has invested more than 7.3 billion euros through more than 300 projects in Serbia. All countries in Europe are in a challenging situation because they need to find a way to deal with the unravelling and actions of the climate crisis as well as to ensure and provide energy security in a sustainable and cost-effective way. Although these challenges are big, they also provide incredible opportunities. By embracing the objectives of the Paris Agreement, we are helping to create a favourable environment for the breakthrough of huge investments in renewables.

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We Are Not Alone on the Path to Green Transformation

Less developed countries are torn between the struggle to preserve energy stability and the domestic economy on the one hand and the pressures imposed by the global energy transition on the other. The main reason for their inability to keep up with the rest of the world is the lack of financial resources, so achieving the carbon neutrality of underdeveloped countries depends largely on advisory, moral and financial support. The European Investment Bank (EIB) actively finances projects that contribute to climate change mitigation around the world and thus represents one of the pillars of the global green transformation.

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Photographs: (Corbo) courtesy of Francesco Corbo; (Bragonzi) courtesy of Alessandro Bragonzi

Photographs: (Sijerić) courtesy of Nino Sijerić; (Stratimirović) courtesy of Tatjana Stratimirović

ENERGY CRISIS AND CHANGES IN SERBIA

The challenges stirred by the energy crisis in Europe require urgent measures and bold decisions to embrace some more energy-efficient times as effortlessly as possible. We need to think promptly about how to ensure energy security, provide more green energy, and how to rationally spend it

Although the supply of oil and gas is still uninterrupted, and the state has plans in place for potential crisis situations that would lead to disruption of the supply chain, it is important to establish diversification of suppliers on which energy stability directly depends.

The Minister of Mining and Energy, Zorana Mihajlović, recently explained that we are currently completely dependent on Russian gas but that the possibility of obtaining gas from other suppliers is opening. The latter will be possible with the completion of the interconnection with Bulgaria, which is due in September next year.

"Our task is to conduct Serbian politics in the interest of Serbia, leaving the emotions aside. Let's see when and how much gas we can get and reserve capacities for next year. The moment we get another supplier, we will become safer," the minister said.

More green energy – it's Elektroprivreda's turn now

The Ministry of Mining and Energy has created all the conditions for more green energy, but when it comes down to installing solar panels on the house roofs, EPS is still not doing its part, Mihajlović stated.

Zorana Mihajlović,
Minister of Mining and Energy

She pointed out that the Ministry started projects of allocating subsidies to households last year for the installation of solar panels. However, the problem is that "Elektroprivreda" still does not sign contracts with citizens.

"We did everything necessary. We passed laws, simplified procedures, and then we stopped because EPS is not doing its part", said Mihajlović in Smederevska Palanka, where she visited the households that participated in the energy efficiency project.

She recently emphasized that greater use of RES in energy production is a way to become energy sufficient, independent, and secure and that if we do not change the structure of the energy mix, we will not have enough energy in the future, which will pose a threat to national security.

The goal is that all households replace carpentry

In early 2022, the Ministry of Mining and Energy announced a new public call for replacing carpentry and installing solar panels in cities and municipalities. The state has allocated 230 million euros to increase energy efficiency in 2022, and since the funds are in place, Mihajlović hopes that all citizens will be able to replace carpentry.

She also announced relief funds for devastated municipalities and socially endangered groups who will reduce their electricity bills by 20 to 30 per cent by replacing carpentry.

"Increasing energy efficiency at the national level means saving 50 million kilowatt-hours per year, which, more importantly, in return gives 300,000 tons less of carbon dioxide emissions", the minister said.

We need to change our attitude towards energy

The government will provide sufficient energy reserves for the next winter season, but that will not come easy or cheap; that's why the citizens of Serbia must start saving and using energy more rationally.

"Serbia will have to make certain decisions, and we will all have to participate in the rationalization process. We are prepared for every scenario, but the question is how much it will cost because there is no such thing as cheap energy", Mihajlović emphasized.

According to her, diversification of gas suppliers is a priority for Serbia. With the completion of the interconnection with Bulgaria, we will have the opportunity to receive gas from LNG terminals in Greece or Azerbaijan. One of the steps toward secure supply is connecting with Northern Macedonia and Romania.

Photographs: (background) Unsplash/Matthew Henry; (Mihajlović) Ministry of Mining and Energy of Serbia

HOW TO CREATE FAVORABLE ENVIRONMENT FOR INVESTMENT AND INNOVATION?

More than 30 years ago, an international financial institution was established in the British capital, whose main goal was to support the transition from a centrally planned economy to an open market and democracy in the countries of Central and Eastern Europe after the fall of the Berlin Wall. This institution, whose name is European and capital mostly American, is still considered a major investor in the private and public sector in 38 countries in Europe and Asia

Francesco Corbo,
Regional Head Energy Europe for Western Balkans and Croatia at EBRD

The European Bank for Reconstruction and Development started the first program in our country through assistance to FR Yugoslavia in 2001. Francesco Corbo, Regional Head Energy Europe for Western Balkans and Croatia at EBRD, told us about the EBRD's priorities today compared to those two decades ago and what has changed in the EBRD's operations in this area.

EP ***It has been announced that from the end of 2022, all EBRD activity will be aligned with one aim: to help countries meet their goals under the Paris Agreement. It sounds like a huge volume of work. What does this actually comprise?***

Francesco Corbo The EBRD Climate Ambition Resolution includes the commitment to align all Bank activities with the objectives of the Paris Agreement by 2022. The Bank is assessing its direct and indirect investments for Paris alignment using methodologies developed jointly with other MDBs. In a nutshell, a project must meet several conditions to be determined as Paris aligned: consistency with a long-term low-carbon development strategy, a low likelihood of carbon lock-in – to give assurance that the project does not enable an emissions-intensive asset to continue operating when economically viable lower-carbon options could replace it, physical climate risks have been identified and addressed, and the activities do not undermine climate resilience in the local context.

The EBRD has been supporting its COO efforts to develop their low-carbon and climate-resilient policy roadmaps at the economy-wide and sectoral levels. Additionally, we work with clients to help them assess climate risks and to integrate climate resilience considerations into their operations.

EP ***Many cities have joined the EBRD programme Green Cities, Belgrade and Skoplje among them. What can you tell us about the support the cities are getting through this programme, and when do you expect the results to be visible to their citizens?***

Francesco Corbo EBRD Green Cities is an initiative which supports cities to identify and plan priority investments that can help them become more sustainable, resilient and, in general, improve the quality of the environment. Participating cities receive assistance from the EBRD in developing feasibility studies, following which they can consider which projects should be their priority investment in the future. The EBRD and donors provide financing for these investments, and there have been lots of developments in the region. For example, in Sarajevo, as part of this programme, we financed energy efficiency improvements in public buildings, new electric trolleybuses, upgrade of water and sewerage network etc. These are the projects where citizens can see obvious results with better services of public utility companies, improved quality of air etc.

Photographs: (background) Unsplash/Appolinary Kalashnikova; (Corbo) courtesy of Franceso Corbo

EP ***The EBRD has a certain fund for investments in green energy transition projects. What does this portfolio include? Is it more energy efficiency or renewable energy sources inclined to?***

Francesco Corbo Green energy transition projects cannot happen without enabling policies. We work with all governments in the region to strengthen their energy sector policy frameworks and align them with relevant EU Directives. On renewables, we are working in Albania, Montenegro, Kosovo, North Macedonia and Serbia to introduce renewable auctions, helping policy-makers design and implement competitive bidding schemes that will aim to add up to more than 1GW of solar and wind capacity once implemented.

A key principle of EBRD support is that the framework needs to be replicable and scalable – therefore, the EBRD is not just supporting the first 100 MW project but laying the foundation for the first 1,000 or even 10,000 MW.

Some results are beginning to come in as our first solar auction for 140MW in Albania, which yielded a price of below 25 EUR/MWh, with bids opened during the first wave of the pandemic in May 2020. This result sent a strong signal to other countries in the region, and the success was replicated when Albania concluded a follow-up solar PV auction in March last year.

And under the Regional Energy Efficiency Programme, REEP, we have delivered in total more than 75 policy products that promote energy efficiency markets. Most of these policies refer to improving energy performance in buildings. The building sector accounts for over 40 per cent of total energy consumption in the Western Balkans, and renovating public and private buildings to meet minimum energy performance standards can make a very significant contribution to national decarbonisation goals. Such works also directly improve the living standards of citizens.

EP ***The EBRD has invested more than €6.6 billion across 286 projects in the country to date. Would you say it has been a success for one institutional investor so far, and please highlight some of the projects that could be considered the ones that have brought the most benefits?***

Francesco Corbo To date, the EBRD has invested over €7.3 billion in Serbia in close to 300 projects since 2001. The impact of our investments is visible in a stronger banking sector and better access to finance for SMEs, in the stronger private sector and local corporates that we supported to become regional champions and brands, like MK Group or Bambi, Knjaz Miloš and Nektar, in hundreds of women-led businesses that we supported with finance and advisory. We also contributed to better roads and railway connectivity which we supported with our partners EU and WBIF, better wastewater infrastructure in Subotica and urban transport in Belgrade and Novi Sad, to name only a few examples. More recently, we support Serbia's efforts to improve waste management infrastructure, which is a sector that has been neglected for years. We finance the construction of the new landfill in Vinča and waste-to-energy plant, as well as several regional landfills across the country. This will help build modern waste management infrastructure in the country and provide new services to citizens, encouraging them to sort and recycle household waste.

EP ***One of the landmark projects in the sector of renewable energy sources is surely the windfarm Čibuk which has been generating emissions-free power for almost three years. It is the second wind project supported by the EBRD. Will the crisis slow the investment pace in renewables?***

Francesco Corbo Having provided financing for the two largest wind farms in Serbia, Čibuk 1 and Kovačica, our aim is to help open a new chapter for expanding investments in Serbia in renewables that have become significantly

Photograph: Pixabay/Đorđje Jovanović

cheaper over the last years. We are advising the Ministry of Mining and Energy with a view to launching the first auction for capacity allocation as soon as feasible. The EBRD also supported the establishment of the Association of Renewable Energy Producers in Serbia, which brings together existing and potential investors to further develop the sector and represent investors in the relevant consultations with the Government. Moreover, the relevance of Serbia equipping itself to decisively meet the challenges of the green transition cannot be overstressed, especially in light of the current energy crises and the present developments connected with the war in Ukraine. Finding a way to face the scale and nature of the climate crisis, as well as being

able to guarantee and secure energy security in a sustainable and economically viable pattern, is challenging for all countries in Europe, Serbia included. While these challenges are significant, the associated opportunities are also enormous. By committing to the goals of the Paris Agreement, we help create the enabling environment to unleash massive investments in renewable energy. This will help address the need for energy security and sustainability; at the same time, investments will create high-quality jobs, open new markets, diversify economies, and build cleaner, more liveable communities that will still prioritise sustainable growth.

All these efforts should lead to more wind and solar projects in the future, and the EBRD stands ready to support them.

Interviewed by: Nevena Đukić

Photographs: (top) Pixabay/Chris Spencer Payne; (middle) Pixabay/Đorđe Nikolić

NEW ENERGY SOLUTIONS

FUTURE WITH FEWER CHALLENGES AND MORE MEGAWATTS INSTALLED

Projects such as the wind farm "Kovačica" with 104.5 megawatts installed and implemented by the company New Energy Solutions positively impact our country's energy and environmental sector. Thanks to this, Serbia is approaching its plan to have 40 per cent of its production in the energy mix by 2040 from RES

The usage of solar and wind energy in Serbia's energy mix today is only 3.5 percent. The only way for our country to be energy safe are further investments in RES. Therefore we have prepared the interview about investments and future wind farm projects with Miloš Perišić, Director of Engineering from New Energy Solutions

EP ***With the accomplishment of the wind farm "Kovačica" project, the largest investment in the mentioned municipality was realized. Would you highlight this as the most significant project in the first 10 years of the company's operation?***

Miloš Perišić New Energy Solutions has been expanding in recent years. It is already one of the most important factors in the field of renewable sources in Serbia and the region. The expectations of the management and all employees in NES are high, so the realization of projects that will surpass even a project such as WPP "Kovačica" is planned, which is undoubtedly the most important project in the first 10 years of the company's work. However, we are also sure that the projects ahead of us will surpass the success achieved by realizing that project.

EP ***Do you have data on the overall reduction of CO_2 emissions and other benefits this project has brought?***

Miloš Perišić The average electricity production from the wind farm "Kovačica" is about 298,000 MWh. If we assume that this production reduces the share of electricity production obtained from the thermal power plant, we come to a reduction in CO_2 emissions by about 250,000 tons per year. We are sure that the positive effect of the "Kovačica"

Photographs: New Energy Solutions

wind farm project is also reflected in the increase in the income of the local community with which we have exceptional cooperation.

EP ***New Energy Solutions is also working on developing the wind farm "Pupin" for the same Investor, the Israeli company Enlight. What can you tell us about this project? What stage is it currently in?***

Miloš Perišić Successful cooperation established with "Enlight", a world-renowned company in the field of renewable sources, continues on the wind farm "Pupin" project. The fact that the company "Enlight" wishes to continue very successful cooperation through new projects is a great honor and recognition of our work.

"Pupin" wind farm is a natural continuation of the "Kovačica" wind farm project. The installed capacity is 95.5 megawatts. A planning document was prepared and adopted, location conditions were provided, and a building permit was obtained. Activities are underway to provide appropriate permits for supporting infrastructure, which primarily

refers to the connection to the transmission system, which is realized by the joint efforts of Elektromreža Srbije AD as the Investor of this part of the project and the company New Energy Solutions.

EP ***Investors are announcing investments in green energy power plants with the capacity of a few hundred megawatts to even a few gigawatts. Do you think EMS is ready to connect new wind farms to the network? What is the current situation?***

Miloš Perišić According to publicly available information on the website of EMS AD, at the moment, there are requests for the connection of over 13 gigawatts from power plants that use renewable energy sources. If we take into account that about 390 megawatts of electricity from wind power plants are currently connected and that the total installed capacity of all power plants in Serbia is about 8 gigawatts, it is clear that EMS AD is currently unable to provide the capacity to cover all the existing requirements. However, the essential question is how much capacity of 13 gigawatts is realistic, what are the deadlines and whether all those power plants will be built. The joint-stock company Elektromreža Srbije has been working for a long time

MILOŠ PERIŠIĆ, Director of Engineering at New Energy Solutions, holds a degree in Electrical Engineering. He was born in 1980. He was educated in Belgrade and gained work experience in EMS AD, where he worked in various positions, from an engineer preparing investment projects for transformer stations to the Director of the Investment Directorate. In EMS AD, in addition to projects financed from their own funds, he was also engaged in IPA projects, i.e., projects financed by the EBRD, EIB and KfW banks. In the Serbian Chamber of Engineers, he was hired as an examiner for the professional field of "the production and transmission of electricity".

on the realization of a project that will enable the connection of power plants from renewable sources in a very serious and significant capacity. Also, I am sure that EMS AD will provide timely preconditions for connecting all power plants that will be built in the coming period.

EP ***Are there any challenges you face in your business, and how do you overcome them?***

Miloš Perišić Challenges often occur on extremely complex projects such as wind farm construction projects because the construction of a wind farm, in addition to the basic project consisting of wind generators with a cable network and then a substation, includes many projects that provide the necessary infrastructure. Connections to the transmission system, traffic infrastructure, projects related to municipal roads, etc., certainly stand out.

To overcome the challenges, i.e. to respond to them successfully, and depending on their nature (whether they are technical, legal or some other nature), it is necessary to have a team that is trained both from a narrow professional point of view and from the legal point of view, while the social aspect must not be neglected. At the same time, cooperation and mutual understanding with representatives of holders of public authority are necessary, primarily with the Provincial Secretariat in charge of construction, Electric Network of Serbia, Electricity Distribution of Serbia, local government and, of course, landowners in each project.

We are pleased to say that in the period so far, cooperation with all participants on our projects has been at the highest possible level and that we have successfully overcome all obstacles with joint efforts. All this gives us hope and faith that there will be fewer challenges in the future and more megawatts installed.

Interviewed by: Milica Marković

WE ARE NOT ALONE ON THE PATH TO GREEN TRANSFORMATION

The energy transition infiltrates almost into all industries and aspects of life where it requires a radical change of practice, and its strict criteria are a challenge even for the strongest economies in the world

Less developed countries are torn between the struggle to preserve energy stability and the domestic economy on the one hand and the pressures imposed by the global energy transition on the other. The main reason for their inability to keep pace with the rest of the world is the lack of financial resources, so achieving carbon neutrality in underdeveloped countries largely depends on advisory, moral and financial support.

The European Investment Bank (EIB) actively finances projects that contribute to climate change mitigation worldwide and thus represents one of the pillars of global green transformation.

We talked about the EIB's strategy and mission and their activities in the Western Balkans and our country with Alessandro Bragonzi, Head of the EIB Regional Office for the Western Balkans.

EP ***The European Investment Bank is one of the main financiers of projects contributing to the fight against climate change. What kind of projects are we talking about, and in which countries are you implementing projects?***

Alessandro Bragonzi Under our Climate Bank Roadmap 2021-2025 adopted in 2020, the EIB has made a commitment to directing 50 per cent of its lending to climate action and environmental sustainability by 2025. This goal was already achieved last year when we allocated €27.6 billion to climate action globally, which represents 51 per cent of our financing volume. We have aligned all our activities with the Paris Agreement goals, confirming our role as a leader in climate financing. We plan to help mobilize €1 trillion in climate and environmental sustainability projects over the current decade.

On the mitigation side, for example, there is a need for energy efficiency investments to reduce energy poverty in Europe or support for low-carbon public transport designed with the travel needs of different socio-economic groups, women and men in mind. Targeted investments in renewable energy – both on and off-grid – can support the 1.1 billion people that today lack access to electricity while tackling related gender inequalities.

Let me mention a few of the concrete climate projects the EIB is supporting across the globe. Together with World Bank, we are implementing the City Climate Finance Gap Fund, which helps cities plan projects that cut emissions and improve daily life in urban areas. Also, Western Balkans' cities benefit from this valuable technical assistance.

In Uganda, the EIB is financing the distribution of 240 000 solar power systems for homes. Thanks to this investment, over a million people across the country will get electricity for the first time to power mobile phones, provide light and make cooking easier. A €280 million EIB loan is enabling ArcelorMittal to develop steel production methods that reduce emissions and help the environment in several EU countries. We support forest renewal in Latin America through the Land Degradation Neutrality Fund, which manages 500 000 hectares of land sustainably. The EIB is financing Europe's first floating wind farm off the coast of Portugal, towering 210 metres above the North Atlantic. An impressive feat of engineering,

Alessandro Bragonzi,
EIB Head of Regional Representation for the Western Balkans

the three turbines generate enough electricity for 60 000 households, saving an estimated 1.1 million tonnes of CO2 a year. Details of the Bank's activities in the sector and highlights of key projects are publicly available. The most recent example is the Climate Action and Environmental Sustainability Overview 2022, published in March.

EP ***The goal of the European Investment Bank is to make Europe a carbon-neutral continent by 2050. Is the same goal achievable for the Western Balkans countries since fossil fuels will have priority over renewable energy sources for a long time to come?***

Alessandro Bragonzi Under the European Green Deal, greenhouse gas emissions will need to be reduced by 55 per cent by 2030. Carbon pricing, a cornerstone of Europe's energy transition, will continue to play a key role, including through the extension of the EU ETS emissions trading scheme to new sectors. Inevitably, these developments will affect the EU acquis, a precondition for Candidate Countries in the Western Balkans to move forward with their EU accession process.

Photographs: (background) Unsplash/Milica Spasojević, (Bragonzi) courtesy of Alessandro Bragonzi

The EIB is investing in the sustainable management of natural resources, biodiversity, and the environment, as well as in infrastructure that will increase resilience to natural disasters and climate change.

Prior to the COP26 conference, the EIB adopted two key frameworks – Paris Alignment for Counterparties (PATH) and the Climate Adaptation Plan.

The leaders of the Western Balkans have committed themselves to provide the necessary investment conditions for raising the share of renewable energy sources (RES), phasing out coal subsidies and cooperating with the EU toward the 2050 target for a carbon-neutral continent.

The EIB has increased its technical and financial support to the Western Balkans by approving a total of 257 million euros in 2021 for environmental protection, safer and more efficient energy networks, sustainable transport, and the introduction of projects with a favorable impact on the climate.

However, several countries in the Western Balkans still heavily rely on coal/lignite for power production, despite deteriorating air quality, adverse health effects and significant untapped potential for renewable energy. Serbia, for instance, has made significant progress, particularly in the renewable energy and energy efficiency sectors, thanks to the adoption of new laws. The country has implemented a market-based support scheme via the newly adopted Law on the Use of Renewable Energy Sources. However, we are still waiting to adopt Serbia's National Energy and Climate Plan, which clearly spells out its decarbonization commitments and pathway.

The Western Balkans, in part of EIB goals to make a Just Transition. It needs our strong support to gradually move away from coals and increase the share of energy from renewables.

EP ***How much has the EIB allocated so far for the Western Balkans, and which projects are key to decarbonizing this part of Europe?***

Alessandro Bragonzi Since 2009, the EIB has invested close to €9.5 billion in the Western Balkans. Our goal is to support sustainable

Photograph: Unsplash/Alex Blokstra

economic development and the EU integration process by improving living and business conditions for people across the region in terms of transport, water accessibility, energy supply, education, and healthcare quality. Regarding climate goals, we are supporting the public and private sectors. For example, we launched a dedicated credit line in 2021 to encourage SMEs to adopt climate and energy-efficient projects and practices, enabling a faster transition to a sustainable and circular economy. In Serbia, together with the EU Delegation, UNDP, Sweden, and the Serbian government, we are helping Serbian companies, and local self-governments implement environmentally friendly projects to reduce the carbon footprint and pollutant emissions, waste and air pollution and help protect biodiversity and the ecosystem.

In Bosnia and Herzegovina, we are providing technical support for preparing the Vlašić renewable energy project, which will facilitate the construction of a 50 MW wind farm in the Travnik region. Thanks to these efforts, the country can boost its energy supply, increase power generation from renewable resources and reduce dependence on fossil fuels, thus stimulating sustainable growth. At the same time, we are investing in large-scale projects that help reduce CO_2 emissions, such as modernization of railways, improvement of inland waterways along the Sava and Danube rivers and the upgrade of urban transport in Sarajevo and Niš. These investments will enable a gradual shift in passenger behavior from private to public and more climate-friendly modes of transportation.

EP ***Last year, the EIB signed a loan for the construction of gas infrastructure for Serbia and Northern Macedonia. How much funding has been approved, and what will these projects mean for our country and region?***

Alessandro Bragonzi In 2021, the EIB signed two loans totaling EUR 66 million for two energy projects in the region – one for the construction of a gas pipeline from Serbia to Bulgaria and the other from North Macedonia to Greece. These two projects will considerably improve the energy supply in the region, enable diversification of the energy supply and help reduce dependence on one dominant supplier.

Both projects for Serbia and North Macedonia are included under the fourth list of projects of common interest and are complemented by a €61.9 million grant from the European Union. To date, the EIB has invested close to €740 million in the energy sector in the Western Balkans.

EP ***The EIB supports the implementation of sustainable transport, digital transformation, and the development of the green economy in Serbia. How much money has been invested in Serbia so far, and what is your long-term plan for our country? Which recently implemented projects in Serbia would you single out, and what else is in the pipeline this year?***

Alessandro Bragonzi The EIB has invested close to €6.5 billion to date to support the development of vital infrastructure and the private sector in Serbia. As you pointed out, we are already helping the country increase its resilience to the COVID-19 pandemic and similar crises by investing in digital infrastructure and a more efficient and secure energy network. Under our new EIB Global arm, we look forward to increasing our support for the preparation and financing of new projects in the areas of renewable energy, sustainable agriculture, and climate change mitigation while at the same time providing vital digital education and healthcare infrastructure.

Innovation will be crucial for tackling global challenges such as climate change, especially at the intersection of digital and green solutions. In Serbia, we are financing the introduction of a 5G network and digital equipment and skills in over 1,500 schools. The EIB has a long tradition of supporting innovative companies globally, including in Serbia, where we have unlocked €200 million for rehabilitation and research and scientific infrastructure development. These funds also enabled the construction of

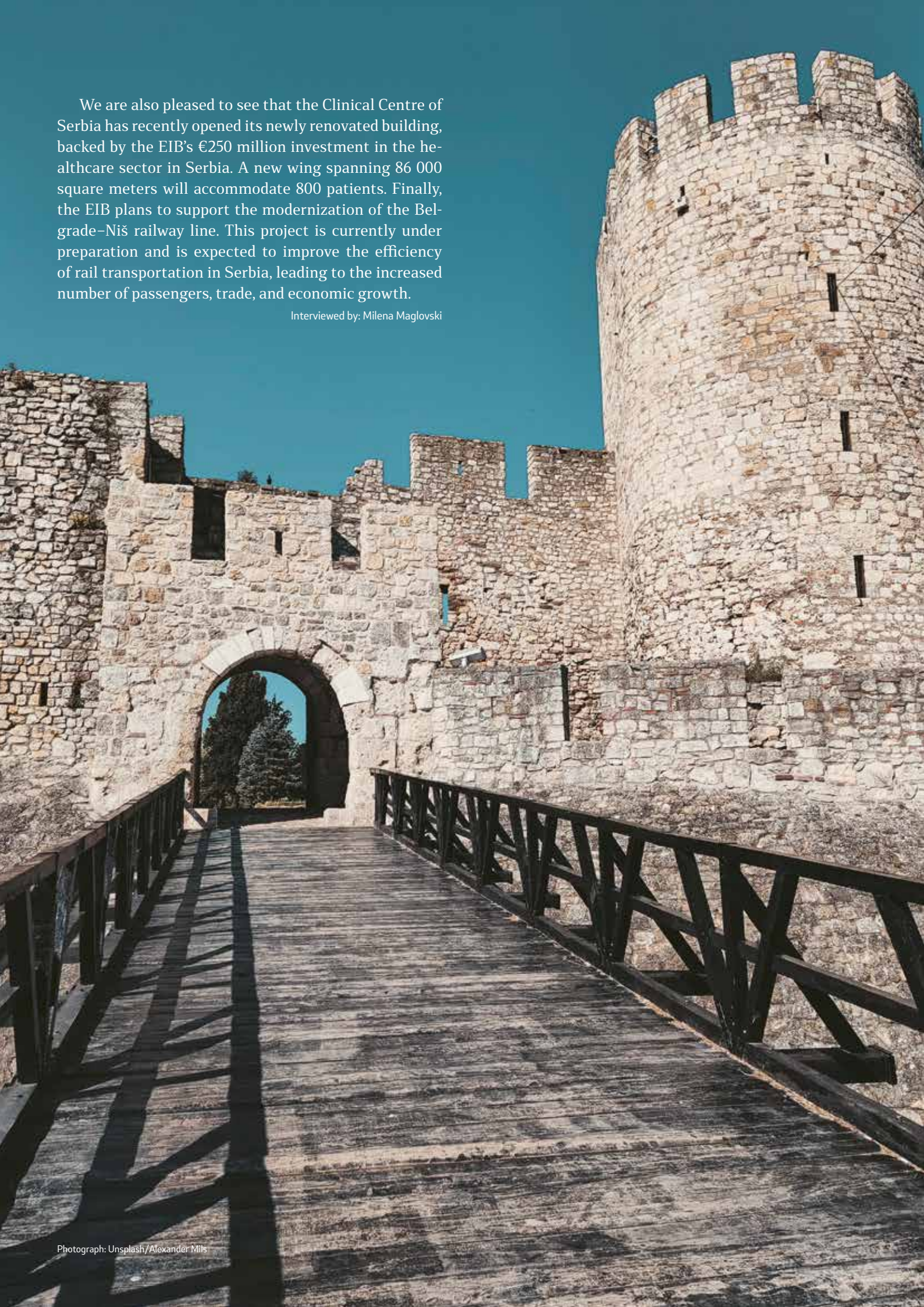
The EIB has made a commitment to directing 50 per cent of its lending to climate action and environmental sustainability by 2025, and this goal was already achieved last year when we allocated €27.6 billion to climate action globally, which represents 51 per cent of our financing volume

three science and technology parks. The one in Novi Sad was opened recently in December 2021. The building for the BioSense Institute, a pioneer in the digital transformation of Serbian agriculture, is also expected to be finished soon. The other two innovation centres in Niš and Belgrade are already making a significant contribution to the development of an innovation ecosystem and the promotion of high-tech projects in various sectors, including environmental protection, energy efficiency and ecology.

Photograph: Unsplash/Branislav Jovičić

We are also pleased to see that the Clinical Centre of Serbia has recently opened its newly renovated building, backed by the EIB's €250 million investment in the healthcare sector in Serbia. A new wing spanning 86 000 square meters will accommodate 800 patients. Finally, the EIB plans to support the modernization of the Belgrade–Niš railway line. This project is currently under preparation and is expected to improve the efficiency of rail transportation in Serbia, leading to the increased number of passengers, trade, and economic growth.

Interviewed by: Milena Maglovski



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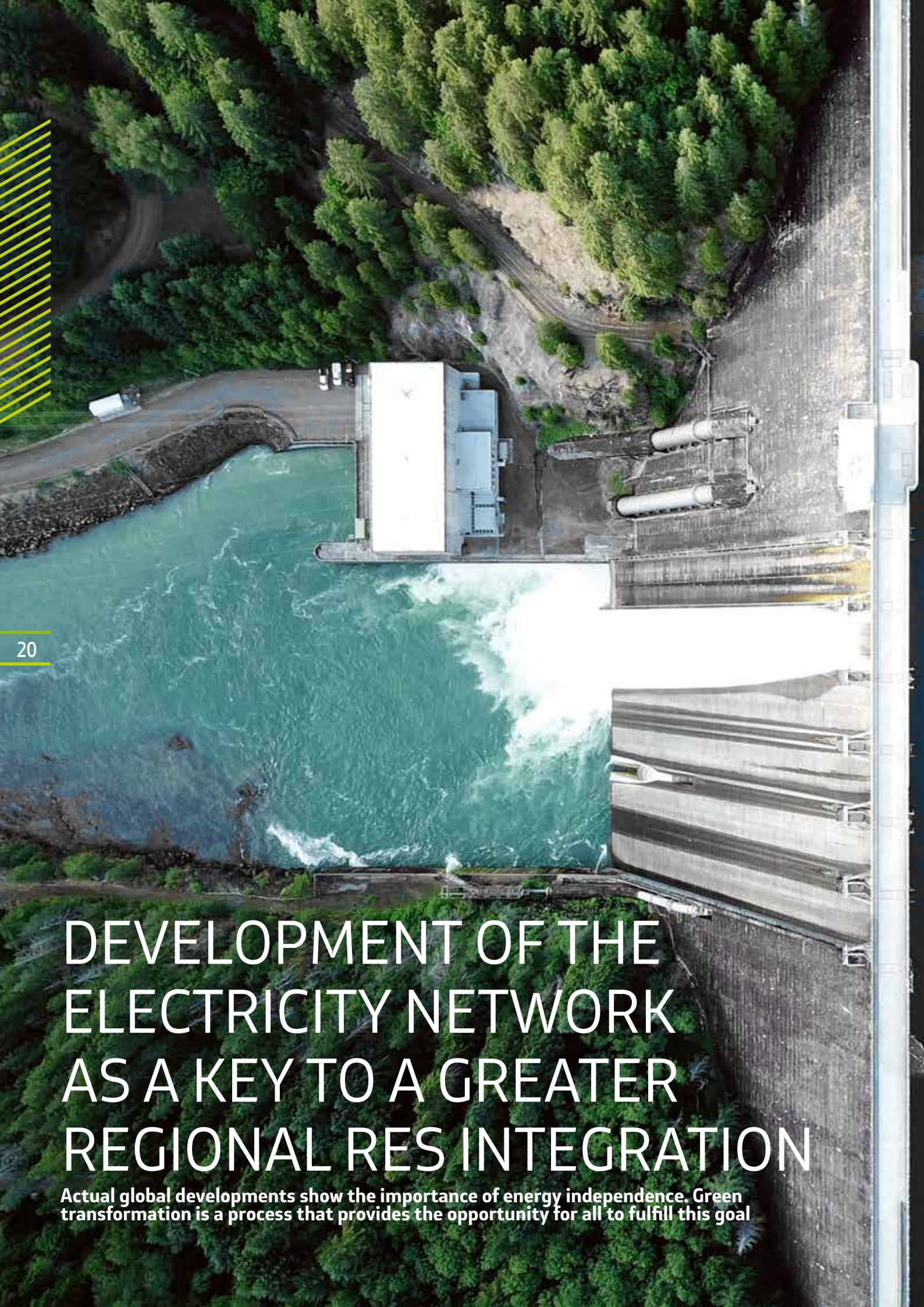


DEVELOPMENT OF THE ELECTRICITY NETWORK AS A KEY TO A GREATER REGIONAL RES INTEGRATION

Actual global developments show the importance of energy independence. Green transformation is a process that provides the opportunity for all to fulfill this goal

This process is unstoppable in developed countries, but despite the odds and good preconditions we have in this region to a more active approach to green transformation, the process is moving insignificantly. It is true that the interest for more significant investments in renewable energy sources exists, but this stream mainly comes from foreign and private investors.

Electrical companies, mostly state-owned, are still dozing peacefully, living at the expense of power plants built in Tito's era. Mass integration of renewable energy sources is a systemic challenge, and proactive work of electrical companies and an understanding of the state apparatus that enacts legal regulations is required. Everyone must set this as imperative to establish a flexible power system that, under real conditions of production and consumption, should ensure stable operation.

A clear vision for energy transformation in Bosnia and Herzegovina is needed

Once the energy transition comes to the agenda, we should be aware that it is an inevitable process that has to start not tomorrow, not today, but yesterday. The energy transition in Bosnia and Herzegovina is sadly a small talk subject, and very little seems to be done in its implementation. All adopted plans and planned reforms of the energy transition are mainly the results of political and economic pressures from abroad.

The pressure to implement the energy transition should be accepted as a chance for the modernization and development of the energy sector. To begin with, it is necessary to define the vision of where the electricity sector of Bosnia and Herzegovina should be positioned in 2030 and 2050.

When you have a clear vision, all government structures, companies, and individuals should actively fulfill their obligations to achieve this vision. Along the way, conventional energy, dominated by fossil fuels, must be transformed into modern energy, now dominated by renewable energy sources. Indeed, to speed up these processes, all positive practices should be used, and mistakes from countries in transition should be avoided.

> Advances in technological development have made it possible to convert solar energy into electricity using solar and wind power plants

RES is unpredictable, and that is a problem for the system

Solar energy is a gift of God and should be used to the maximum. Technological advances have made it possible to convert solar energy into electricity using solar and wind power plants.

The unpredictability of energy production from these sources creates a problem in the power system, especially regarding large power plants. However, these problems are not uncommon all over the globe, and we should not run away from them and leave them to generations to come but focus on solving them.

A very efficient domestic solution could be the combination of solar power plants, wind power plants, and hydroelectric power plants. Bosnia and Herzegovina have very good preconditions for developing such a hybrid power system. That is why it is essential that, in addition to the great interest in the construction of solar and wind power plants, we keep the focus on the use of our hydro potentials. Although the public has a misconception about hydropower, in the future, there will be no reliant electricity system without hydropower components.

Electricity storage is one of the biggest challenges

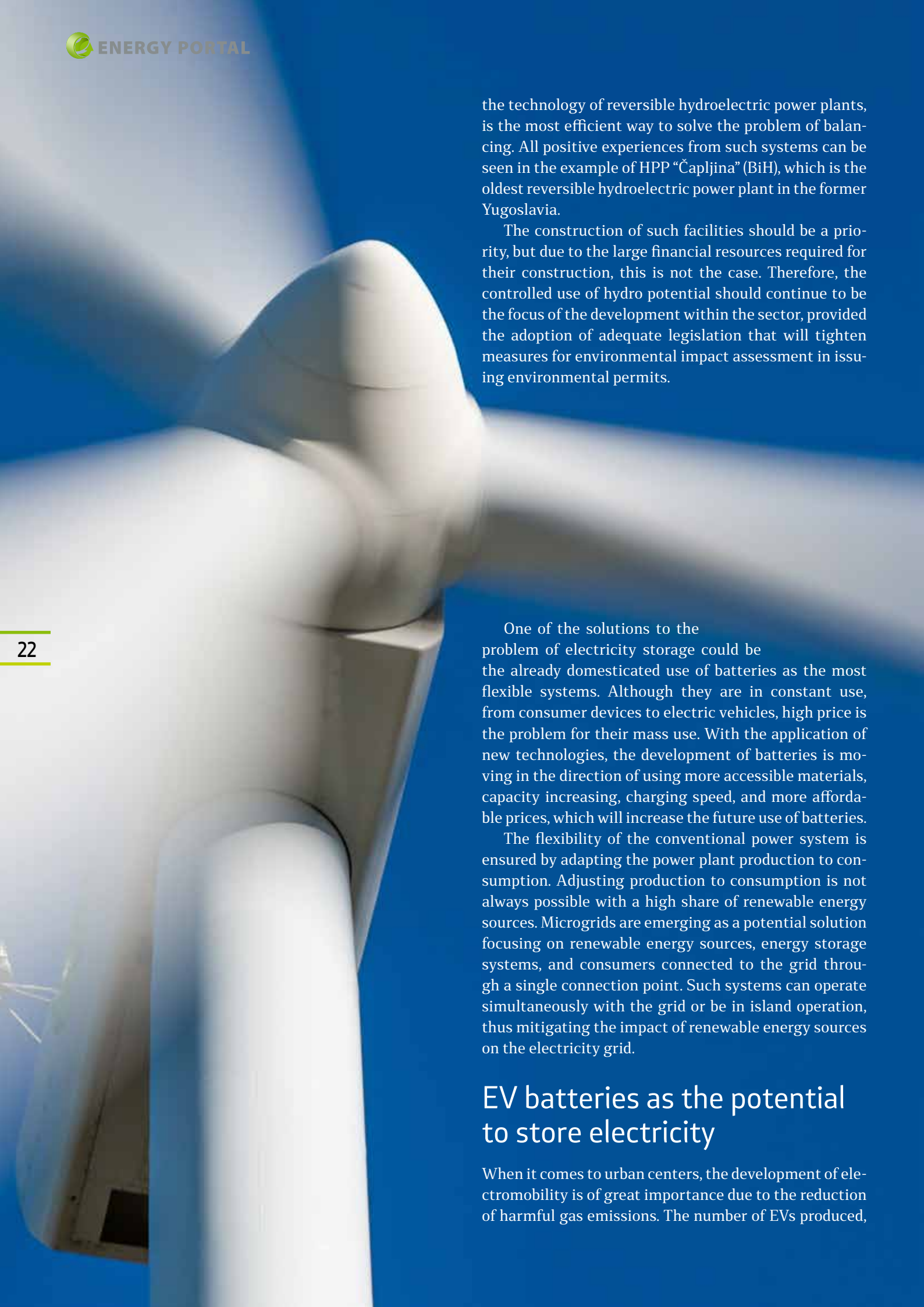
The concepts of electricity storage in some special cases are well known in theory and practice; therefore, increasing their capacity and popularization are prerequisites for creating an ideal electricity sector.

With the mass integration of renewable energy sources into the electricity system, energy "deficits" and "surpluses" are inevitable, and that's why the management of the electricity system becomes an even greater challenge. It is the very storage of electricity that plays a key role in solving this problem, and a future modern concept of the electricity system is required where energy storage becomes an equal participant along with the sources and consumers.

The problems could be solved in one of three ways: by balancing the energy in the network by building new production facilities, storing energy, and applying the concept of micro-networks.

The topic of balancing energy in the grid is often mentioned as a key challenge in variable production from renewable energy sources. Hydro power plants, especially

Photographs: (background) Unsplash/Dan Meyers



the technology of reversible hydroelectric power plants, is the most efficient way to solve the problem of balancing. All positive experiences from such systems can be seen in the example of HPP "Čapljina" (BiH), which is the oldest reversible hydroelectric power plant in the former Yugoslavia.

The construction of such facilities should be a priority, but due to the large financial resources required for their construction, this is not the case. Therefore, the controlled use of hydro potential should continue to be the focus of the development within the sector, provided the adoption of adequate legislation that will tighten measures for environmental impact assessment in issuing environmental permits.

One of the solutions to the problem of electricity storage could be the already domesticated use of batteries as the most flexible systems. Although they are in constant use, from consumer devices to electric vehicles, high price is the problem for their mass use. With the application of new technologies, the development of batteries is moving in the direction of using more accessible materials, capacity increasing, charging speed, and more affordable prices, which will increase the future use of batteries.

The flexibility of the conventional power system is ensured by adapting the power plant production to consumption. Adjusting production to consumption is not always possible with a high share of renewable energy sources. Microgrids are emerging as a potential solution focusing on renewable energy sources, energy storage systems, and consumers connected to the grid through a single connection point. Such systems can operate simultaneously with the grid or be in island operation, thus mitigating the impact of renewable energy sources on the electricity grid.

EV batteries as the potential to store electricity

When it comes to urban centers, the development of electromobility is of great importance due to the reduction of harmful gas emissions. The number of EVs produced,

sold, or bought worldwide has been increasing in recent years, and Bosnia and Herzegovina will certainly follow this trend. The fuel prices these days make every driver think about an electric vehicle, but the cost of those vehicles is still high and is a limiting factor, so we continue to drive our "fossil pets".

EV batteries will certainly be able to be used for storing electricity. However, many problems exist behind the corner regarding the mass use of electric vehicles, so the fate of electromobility will depend on the pace of construction of charging infrastructure and planning the management of electricity consumption. The adoption of the legal framework will certainly define the speed of the introduction of electromobility because the current situation in the legislation treats the installation of electric chargers in the same way as the construction of skyscrapers.

Serbia and Bosnia and Herzegovina at the energy crossroad

In both Serbia and BiH, electricity is mainly produced from thermal power plants, and the two countries are under constant pressure from the energy community. This is debatable, justified or not, but the fact is that both countries must start with the modernization and decarbonization of their power systems.

However, shutting down thermal power plants overnight would have unforeseeable consequences for the economies. Governments that own power companies need to be more attentive to these problems and work more proactively to address them. All processes should be well planned and smartly implemented concerning national interests and needs. All participants, from producers to consumers, must be on the same side in the process.

Switching to a smart grid is an imperative in the green transformation process

As an example of the applied advanced technologies, smart grids are a key concept in a modern power system that enables a more reliable and efficient way of operating the distribution power system. That is why the transition to a smart grid is becoming imperative in the process of energy transition and green transformation.

The electricity system in Bosnia and Herzegovina has not changed significantly for more than 50 years, so it is necessary to invest all efforts to change the current situation and make the system more flexible. It is a complex, long-lasting process because the modernization of the electric power system affects the entire production process, transmission, and distribution of electricity. Some pilot projects for the application of smart technologies have been realized, and their wider use will still have to wait.

SENAD HUSEINBEGOVIĆ works as a professor at the Faculty of Electrical Engineering, University of Sarajevo. He is currently the Head of the Department of Automation and Electronics. His research interests cover energy electronics, renewable energy sources, and energy efficiency.

Photographs: (background) Pixabay/Jose Antonio Alba; (Huseinbegović) courtesy of Senad Huseinbegović

LUXOR SOLAR – WE OFFER CUSTOMERS ONLY THE BEST AND MOST FLEXIBLE SOLUTION

More than a hundred years have passed since the discovery of the photovoltaic effect - the way of converting solar energy into electricity, and the first solar panels were produced only in 1958 for the needs of space satellites. With the development of technology, solar energy has gained importance in the last two decades. Solar panels produced by Luxor Solar, the leading company in the number of sold solar modules in our market, are installed in over 85 countries around the world. The company's production capacity was 1,200 MWp in 2021, while 4.2 GW is expected by the end of 2022. We talked about Luxor Solar products with Nino Sijerić, Business Development Manager of this renowned company.

EP ***The German company Luxor Solar is a certified manufacturer of solar modules with over 15 years of experience. What else can you tell us about the company?***

Nino Sijerić Luxor Solar has been manufacturing solar modules since 2007, and we have been a recognizable brand in the region for over a decade. This year we received the certificate "TOP PV BRAND Serbia, Slovenia, North Macedonia, Bosnia and Herzegovina, and Greece". This certificate confirms the company's outstanding contribution to developing the mentioned markets.

EP ***Your customers have a rich portfolio of solar panels at their disposal that can meet their different needs. What modules do you produce, and which model is the most sought after?***

Nino Sijerić Our standard products are monocrystalline solar panels with a half-cell architecture, most often with M6 cells with a diagonal of 166 mm and rated power of 380 Wp and 450/455 Wp and M10 with a diagonal of 182 mm with a rated power of 410/415 in dimensions of 1,722 mm × 1,134 mm × 30 mm, and then like their "big brother" 540, 545 and 550 Wp dimensions 2,279 mm × 1,134 × 35 mm. I would especially highlight the bifacial version of the 540 Wp BIF for larger rooftop and ground projects.

EP ***When will you have higher power panels on offer, around 650Wp?***

Nino Sijerić It is already possible to order 660 Wp with M12 cells or a diagonal of 210 mm and a half-cell architecture

NINO SIJERIĆ was born in 1983 in Sisak, from where he moved with his family to Germany. He holds a degree in Social Sciences from the University of Stuttgart. The topic of his final work was "Changing the structure of the photovoltaic industry after the introduction of the RES Law in 2003".

During his studies, he started his internship at Luxor Solar GmbH, and since 2011 he has been monitoring the markets of Southeast Europe in the business development sector of this company. In the last 3 years, all leading markets have achieved 100 per cent growth.

Each project is distinct and very individual, so the most important thing is to have a reliable designer who can optimally use individual parameters in a particular location

measuring 2,384 mm × 1,303 mm × 35 mm and 34 kg in weight. This model is primarily suitable for large power plants, and I recommend it for that purpose.

EP ***We are witnessing that companies are increasingly interested in solar energy, but also individual households that are trying to reduce their electricity bills. Which panels would you recommend to them? Can the panels recommended for installation on the ground be used for industrial halls in terms of size and weight?***

Nino Sijerić Each project is distinct and very individual, so the most important thing is to have a reliable designer who can optimally use individual parameters in a particular location. For private homes, I recommend the modules with the highest efficiency and the longest possible warranty - 410/415 Wp and 380 Wp in the standard version or premium version, with a 30-year warranty.

EP ***Solar energy technology is developing intensively, so bifacial or double-sided solar panels are increasingly present on the market. Who are these panels for, and what is the difference compared to monofacial modules? What is the maximum bifacial gain – the gain in effect due to the albedo effect (reflection on the surface)?***

Nino Sijerić With optimal reflection, i.e. max albedo, you can achieve up to 80 per cent front-side power and nominal power additionally (up to 95 per cent for heterojunction models). For example, 410 Bifacial modules are ideal wherever there is a base with the reflection of light for additional electricity production. So, on a roof and with a 10 cm distance from a tile or roof surface, you can expect 3 to 8 per cent higher production, and if the roof surface is light in color, then up to 11 per cent more. In general, users are increasingly choosing bifaciality because it does not cost much more in production, and the price difference is justified given the expected result.

I will give an example from Germany, where a test was done by the independent institution "Tuv Sud Rheinland". The modules were installed above the gravel at the height of 1.5 m, and the production increased by 11 per cent in one year.

EP ***What is Heterojunction Technology in the Photovoltaic Industry? What are the advantages of these panels over others?***

Photographs: (background) Pixabay; (top) courtesy of Nino Sijerić; (next page) Pixabay

Nino Sijerić Heterojunction technology is the fastest growing technology and at the moment, the only one that gives us, the producers, an additional jump in efficiency, from 1 to 2 per cent in mass production, and is justified in its economic and technical capabilities. HJT modules have better efficiency, almost do not degrade or degrade much less than others, and are excellent when working at high air temperatures.

EP ***Why do panels generally lose 2 per cent of efficiency in the first year and 0.5 per cent later?***

Nino Sijerić Every material ages, including the crystal cells that represent the heart of the solar module. The initial degradation is the greatest because then the first production occurs, the light is converted into electricity – the first contact of light with silicon leads to a reaction, and we come to the so-called light-induced degradation. We call this the Staebler-Wronski effect. This effect stabilizes after approximately the first 1,000 working hours, which is why the degradation percentage decreases from the initial 2 to 0.5 per cent. In any case, users do not have to worry because manufacturers guarantee a certain nominal module power for each year. (See warranty card i.e. declaration – e.g. for ECO LINE https://www.luxor.solar/files/luxor/download/pdf/LX_eco_line_guarantee-declaration.pdf)

EP ***Are there certain months in the year when the panels collect the most energy? Is it true that it is not July and August as it is thought?***

Nino Sijerić In the technical sense, photovoltaic has two enemies – shadow and temperature. Each module is tested at 25 degrees Celsius at its rated power. As soon as the air temperature jumps by one degree, we lose about 0.05 per cent of efficiency. Thus, it may happen that one sunny, cold month, gives better electricity production than one sunny, very hot one.

EP ***Since Luxor Solar operates in 85 countries, you are sure to often meet the special requirements of clients from different climates. How does the company respond to them? What are the experiences in cooperation with companies in the Balkans, especially in the Serbian market?***

Nino Sijerić Luxor Solar always strives to offer customers the fastest and most flexible solution; we tailor our business models in accordance with the market and the needs

of our customers. Of course, this requires mutual trust as well as economic justification. We expect planning from the client, and the client expects the best conditions for a successful business from us. We achieve this by offering conditions such as a German warranty on each module delivered for up to 30 years per product and up to 30 years per production.

We are always available to clients at our headquarters in Stuttgart, the region, and Serbia. According to all these parameters, we are absolutely without competition in the market. Customers know whom to turn to when looking for a German warranty and who to contact when looking for a Chinese one. And for that advantage, the customer does not always pay a higher price than the competition from the Far East – and that is why we are the TOP PV Brand in the region.

EP ***What challenges do you face in business? How do you overcome them?***

Nino Sijerić The biggest challenge we are currently facing is the chaos in shipping, which began with the proclamation of the coronavirus pandemic. Immediately after that, a blessing in disguise is higher demand due to the increase in electricity prices, which is good for our business. However, we also need energy for production. As soon as the price of oil rises, so do the prices of plastic, glass, aluminum, and everything crucial to producing panels.

> Solar panels produced by Luxor Solar are installed in over 85 countries around the world, and the company's production capacity was 1,200 MWp in 2021, while 4.2 GW is expected by the end of 2022

But as long as it is profitable, our activities are insured. Before the pandemic, the price of electricity on the stock exchange was 50-80 euros per kWh, and today it is 180-280 euros. We offer the fastest and most affordable medicine for customers with high electricity consumption, which is why our clients have contracted work until next year, and we all hope there will be even more work.

Interviewed by: Milica Marković

TOGETHER FOR A HEALTHY ENVIRONMENT

Suppose you had the opportunity to visit Slovenia. In that case, you must have noticed that there is no scattered paper and waste, all green areas are arranged, and what particularly impressed me was the flowers that can be seen on almost every terrace and window. It seems that in this country, people pay special attention to the space in which they live and that they really take care of the environment and its protection. The citizens who take care of everything are the most deserving of that, but also the non-governmental organizations that are there to help and point out mistakes and omissions

The Slovenian Association of the Ecological Movement – ZEG is an association of ecological movements whose common goal is the development and protection of the environment. It was founded in 2002 and currently unites 11 environmental movements and five non-profit institutions.

"In 1992, an association called the Slovenian Ecological Movement – SEG was founded, which gained 2,600 members in a few years. The Association of Ecological Movements – ZEG, founded in 1997, became the holder of the associations in Slovenia, and from 1997 to 2002, it helped in the establishment and registration of 15 associations. Our goal is to protect the environment. We have a large number of engineers, doctors, masters, and experts in many fields who are always available to us. They help us prepare expert opinions, remarks and everything we need when we give proposals for some laws and the like," Karel Lipič, President of the Slovenian Association of the Ecological Movement, explains.

ZEG focuses on four activities: waste management, air quality protection, water protection and harmful radiation.

"Of course, we pay attention to other important areas and are all particularly interested in the energy issue. In addition, we pay special attention to education, especially the youngest, and we actively participate in the im-

plementation of the Eco-School project. We cooperate with the Government and ministries, the Chamber of Commerce, and competent institutions. We have been given a special status, and every year we submit reports to the authorities because we actively participate in solving major problems in Slovenia. We supervise the construction of a landfill for highly active waste from the nuclear power plant. We are also participating in drafting the law for a better life for people who live near industrial facilities that can affect pollution," our interlocutor says.

There was a lot of talk about the Environmental Protection Act of Slovenia, and ZEG actively participated in its drafting. ZEG members were speakers at the Public Debate last year while they submitted another remark regarding the area of waste management and water protection. From the beginning, they followed the drafting of the law, and they also participated in the drafting and gave expert suggestions and remarks.

Waste problem

Although there is no waste in Slovenia, at least not the visible one, this country has big problems with it. They are intensively monitoring what and how it is being done in Croatia, as well as in the countries of the region when it comes to this. They pay special attention to the problem of plastic packaging, i.e. plastic waste.

"The bail system has been developed to some extent in Croatia, but their solutions have not brought great results. That is why I plan to hear from their representatives how the system works at the conference that will be organized in October this year so that we can see how we can apply it in our country," Karel points out.

There is a developed system in Slovenia for collecting municipal waste. A good part of it is recycled, but the problem of its disposal needs to be solved permanently. In this association, they see the solution in constructing incinerators which would solve this problem but also provide a safe source of thermal energy. The incinerators would be modeled on those in Vienna, Germany, Italy, and Switzerland.

"We are fighting for industrial waste processing, and five locations for the construction of incinerators have been determined in Slovenia. Of course, some are against their construction, but I think that brings great

Karel Lipič,
President of the Slovenian Association of the Ecological Movement

Photographs: (background) Pixabay/jiriposival; (Lipič) courtesy of Karel Lipič

TIPS FOR SERBIA

"Education is the key to everything, and it must start with the youngest, kindergartens, schools. A good example is the Eco-School, which is already being implemented in our country. We are willing to help as much as we can with our experience. In addition, I think we should work together on projects in the field of environmental protection. You also have to work on the problem of waste, you have to use new technologies, listen to experiences and apply good practice from the region," Karel Lipič says.

damage to both the economy and industry. One will be built in Ljubljana, one in Maribor and three more in other places. All documents have been prepared for the incinerator in Ljubljana. The construction should begin early next year and it should be completed by 2024. When it comes to Maribor, the documentation is ready, and I expect that it will be built by 2024. Their construction will solve 60 to 70 per cent of waste in Slovenia. Of course, during the construction of incinerators, the most modern technology must be used, they must not pollute the air and the environment, and they must provide electricity and heat", Karel Lipič points out.

In their work, they are always guided by good examples from other countries, and professional counseling gives them answers to questions that bother them. Our interlocutor points out that the basis of everything is good laws, but also their good application. He pays special attention to the fact that municipalities are the most important in the whole system and the way in which they apply the laws.

Water as a "national treasure"

The Law on Water Resources in Slovenia has caused great confusion. If the first proposal of this law had been adopted, many companies would have easily reached the land along the rivers and lakes, built facilities, and then privatized it all. Fortunately, the citizens did not allow this law to be adopted.

"Instead of the law being professionally prepared, it contained parts that enabled everything to be privatized. We were all against it because, in previous years, we had

ZEG focuses on four activities: waste management, air quality protection, water protection and harmful radiation

sold water to multinational companies which is why we did not want to have the law as they proposed. The non-governmental sector collected 43,500 certified signatures. Then we went to a referendum where 80 per cent of citizens voted against the proposed law. We put drinking water first, changed the Constitution and protected it. Slovenia is the only country that has done that," Karel explains.

When it comes to renewable energy sources, they exist in the energy mix, but to make progress, Slovenia's Energy Concept must be adopted. According to our interlocutor, a lot of work is being done on the development of this concept, and the document is being prepared.

"We use renewable energy sources, but we are generally not satisfied with their use. I think we could use them to a much greater extent. The Sun and wind are number one, but unfortunately, we do not have many power plants built. Solar power plants are being built, and there are subsidies for installing solar panels on the roofs of houses. We expect this to become a priority again so that citizens can produce energy for their own needs," he says.

Photographs: (left) Pixabay/12019; (right) Pixabay/ravisimo

When it comes to wind farms, Karel Lipič points out that a mistake was made because some NGOs were against their construction. Due to that, only two wind farms were built, and in Slovenia, there is a possibility that there are as many as 96.

The expansion of the Krško nuclear power plant has been talked about for some time, but ZEG is fiercely fighting against it.

"We use the energy from the nuclear power plant together with the citizens of Croatia, fifty-fifty. I draw attention to the open issue of waste, and I would add that a large number of people are against the construction of a new block. We will all make the final decision in a referendum," he says sincerely.

Karel says that ZEG is not against development and progress but that environmental protection must be a priority.

Prepared by: Milica Radičević

Photograph: Unsplash/Martino Pietropoli

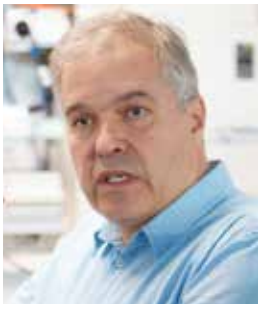
SCHNEIDER ELECTRIC IS A LEADER IN DIGITALIZATION OF ELECTRIC ENERGY

The need for decarbonization and reducing greenhouse gas emission has reached its peak and the important part of the entire process lies in electromobility and efforts to reduce pollution produced by the means of transportation to a minimum. Serbia joins this trend and the slogan of this year's Belgrade Car Show "Natural RPM" is the very reflection of that. Vehicles with environmentally advanced power solutions, electric cars and hybrids are ever more in the spotlight so we discussed trends and future of the electric mobility with Darko Zeljković, Offer Manager in Schneider Electric.

EP ***Schneider Electric is a leading company in energy management and automation sector and one of the most influential companies when it comes to sustainability. In addition to industrial software, you're also focused also on software which contribute to electric mobility, as well as chargers for electric vehicles. What does Schneider offer in our market?***

Darko Zeljković In the field of eMobility, in the Serbia and Montenegro markets, Schneider Electric, with its network of specialized partners, offers products and solutions under a single commercial name EcoStruxure™ for eMobility. In addition to several models of EVlink AC chargers with up to 22W of total power, and DC chargers with up to 24kW of total power, we also develop and offer software solutions in order to provide smart and efficient charging of electric vehicles. In the first place, I would like to single out our EcoStruxure™ EV Charging Expert. Adding infrastructure for charging of electric vehicles increases electricity consumption in a facility. In order to avoid overload and possible "outages" of electric power systems in facilities, Schneider Electric has developed this solution to manage burdened infrastructure for charging of electric vehicles, access management and monitoring of chargers. With this solution you can control functioning of up to 1,000 charging stations in a multizone regime and at the same time provide adequate prioritization for users of chargers.

The current number of installed chargers, especially those publicly available, certainly is not enough to encourage owners of electric vehicles to come and visit Serbia



DARKO ZELJKOVIĆ is a Bachelor of Science in Mechanical Engineering, who works in Schneider Electric for more than 10 years and is in charge of the placement and positioning and low voltage products.

EP ***The company also participated at this year's Car Show. Can you tell us more about your impressions, and do you believe that now there are more car industry lovers who believe that there is a need to transfer to electric vehicles and hybrid vehicles?***

Darko Zeljković Yes. This is the first time that our company participated at the Car Show in Serbia. Having in mind that this year's Car Show was an eco show and that leading manufacturers in the car industry presented their models of Plug-In hybrid and electric vehicles, our decision to be present there was a logical one. And I don't refer only to the chargers, but protective equipment used upon the installation of the chargers and distribution systems for safe distribution of electric energy to supply the chargers. I'm personally very pleased with the number of people who showed interest in products we presented, which is certainly one of the indicators that there is an increasing number of drivers ready to use electric vehicles and installation of chargers in their yards and garages. I'm also especially glad that there is also an increasing number of investors building residential and business facilities, we had an opportunity to talk to at the fair, who are ready to provide parking spots with electric vehicles chargers to their clients.

I also believe that car exhibitors who took part at the fair are satisfied with their participation.

EP ***Schneider has already installed a certain number of chargers for electric vehicles across Serbia and the region. What chargers we are talking about and are the market requirements for electric chargers satisfied?***

Darko Zeljković With its products and solutions, Schneider Electric has been present in the market of electric vehicle chargers since 2011, and almost 160,000 AC and DC charging points have been installed across the globe so far. In Serbia and Montenegro, this market embarked on an active development 4 to 5 years ago, and we now have almost 320 installed chargers with one or two connectors. They are

It is very important to develop a network of publicly available chargers along highways, in the vicinity of key traffic road links and public transport stations

Photographs: Schneider Electric; (Zeljković) courtesy of Darko Zeljković

Until 2040, 90 per cent of installed chargers will be in private sector – mostly in residential, business or industrial buildings

mainly smart AC chargers with 7.4kW, 11kW and 22 kW of total power.

Considering the current number of electric cars in Serbia and Montenegro, maybe it is safe to say that the need for electric chargers has been satisfied. But, if we take into account trends in the car industry and in the field of eMobility in the world which would most certainly spill over Serbia and Montenegro in the future, the current number of installed chargers, especially those publicly available, certainly is not enough to encourage owners of electric vehicles to come and visit us in their favourite vehicles, or stop on their way to a different destination.

EP ***Can you tell us more about global trends when it comes to eMobility and what is awaiting us in the near future?***

Darko Zeljković One of the global trends with a major impact on the direction of development and electrification of traffic is most certainly Urbanisation. According to experts, we can expect 2.5 bn people more to relocate to cities until 2050. One of the ways to protect the environment and reduce the emission of greenhouse gases to a minimum is an increasing number of electric vehicles. We expect the running cost of EVs per km to be much lower than costs of cars with an internal combustion engine very soon. Some conservative forecasts say that until the end of the next decade, one in three vehicles sold in the world will be an electric vehicle whereas more optimistic predictions announce even higher percentage. Therefore, further development of the network of electric chargers is a very important step, and estimations confirm that up to 500 million of charging points for electric vehicles will be installed until 2040.

EP ***Having all this in mind, what will Schneider Electric focus on in the upcoming period?***

Darko Zeljković The majority of existing policies focuses on the installation of public infrastructure for charging today. It is very important to develop a network of publicly available chargers along highways, in the vicinity of key traffic road links and public transport stations.

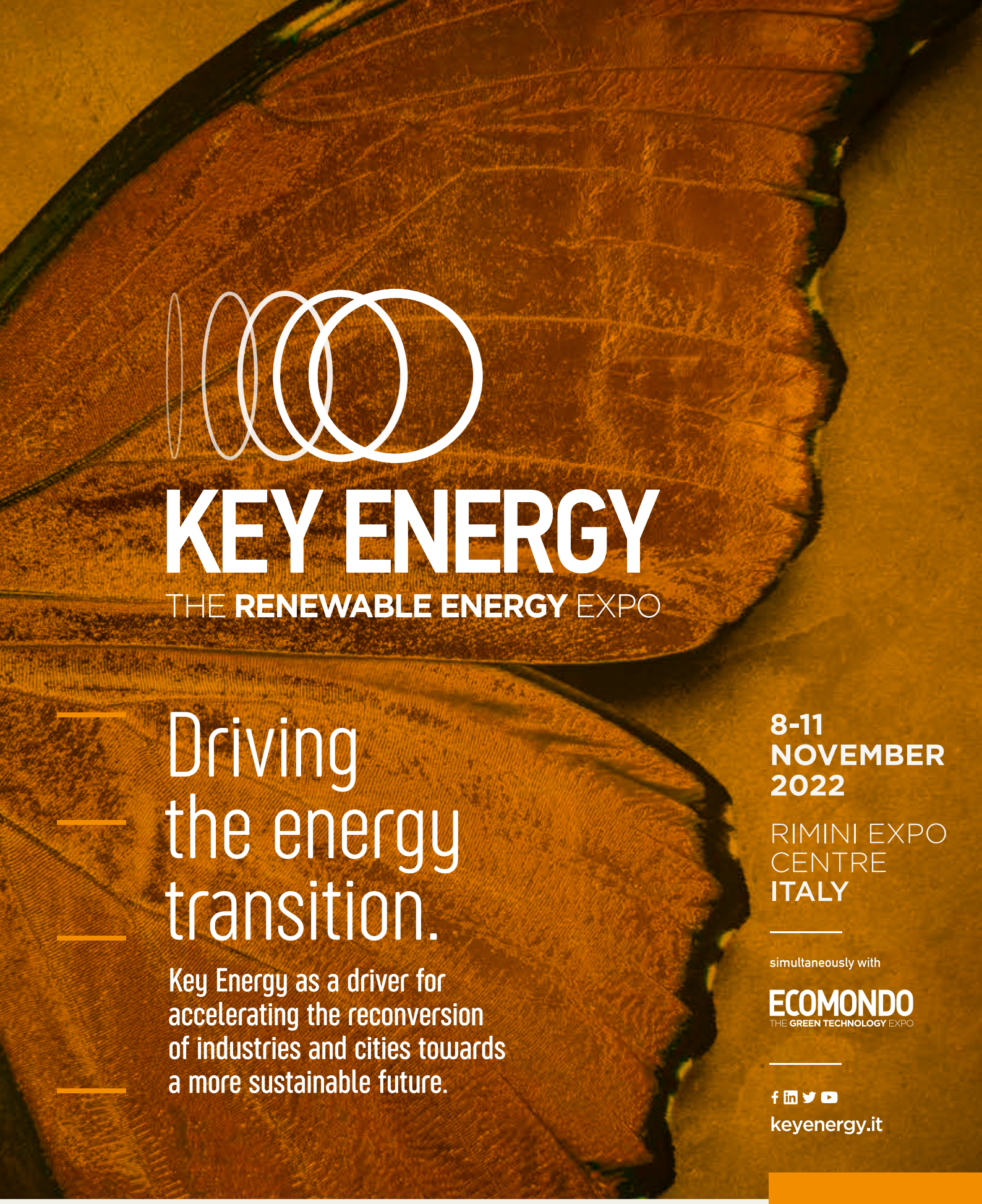
However, cca 90% of chargers installed until 2040 will be private settings, mainly in our residential, commercials and industrial buildings. The expected exponential growth of EV chargers in this market segment will have an increased electricity consumption as a consequence. That is why Schneider Electric continues to develop different series of AC and DC chargers, as well as software solutions, in order to provide "smart charging" and top-level user experience.

In addition, during the traffic electrification process with an aim to produce "green electric energy", the maximum use of renewable energy sources (solar electric power plants, wind parks etc) is imposed as an imperative, together with energy storage systems whereas individual producers/consumers, the so-called prosumers, will account for an important segment of an active and decentralized electric energy system with their own capacities.

The estimations confirm that up to 500 million of charging points for electric vehicles will be installed until 2040.

Schneider Electric has already imposed itself as a leader in digitalization of electric energy and decentralization of electric energy systems with its solutions, something that will pose one of the core preconditions for proper functioning of all systems in the future, including the network of EV chargers.

Interviewed by: Milica Marković



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"ENERGY EFFICIENCY MOVEMENT" TICKET TO THE SUCCESS CLUB

When electricity prices are reaching their historic highs and the climate crisis is triggering the closure of fossil fuel power plants, it is the right time to think about how we can save electricity in our homes and production facilities.

For many years, ABB has been aiding industry and citizens reduce electricity consumption while maintaining maximum operability. Recently, the "Energy efficiency movement" campaign was launched to turn energy efficiency into a global movement.

We talked to Milan Jevremović, Local Business Manager, Motion at ABB Serbia, who explains that the campaign was launched last year with the intention to create a general movement accepted by state and scientific institutions, companies, and individuals. Only together can we create an ecosystem that can help us all consume less energy.

"Our plan for the campaign is to last four years, and we are monitoring how various companies and institutions

All photographs: ABB

Milan Jevremović,
Local Business Manager, Motion at ABB Serbia

are involved. We have a lot of foreign companies that have officially joined the 'Energy efficiency movement' as part of their business, and the idea is to continue with that after the campaign is over," Jevremović said.

The research shows that improving energy efficiency could reduce overall global electricity consumption by about 10 per cent.

The last year has brought a shift when it comes to electric motors after a new standard in terms of energy efficiency was set. In June last year, a new regulation came into force in the European Union, which prevents the sale and use of energy-inefficient motors.

"ABB monitors the development of materials and the quality of energy-efficient motors and complies with current regulations. It is especially important bearing in mind that about 45 per cent of the world's electricity consumption is made up of electric motors, and it is expected that the number of electric motors will double by 2040", he explained.

Only energy-efficient electric drives can make a significant difference, says Jevremović, adding that every percentage of savings, even on small home appliances, can make a huge contribution given the millions of such appliances in use.

European countries and their success stories

Almost every responsible company strives to make its business more energy-efficient, and ABB is here to help maximize savings.

Milan Jevremović turned to Ikea, which is consistent with its sustainability strategy and still seeks to reduce total emissions by 80 per cent by 2030. ABB has brought this renowned company closer to this admirable goal through the Energy Efficiency Movement campaign, after which an increase of 25 per cent in the energy efficiency of the system along with a decrease of some 425 tons of CO2 on an annual basis was reached.

Another successful example of improved energy efficiency is the renowned sugar factory in Belgium, which, thanks to ABB, has reduced its electricity costs by 27.42 per cent and its CO_2 emissions by nearly 120 tons per year.

These are just some of the companies that, entrusting the energy improvement of their plants to ABB, now operate in the most modern, efficient, and responsible way.

Savings in HHP "Bajina Bašta"

One of the largest reversible hydropower plants in Europe is located in our country. HHP "Bajina Basta" is one step away from significant electricity savings thanks to the static frequency converter successfully commissioned by ABB at the end of April earlier this year.

As Milan Jevremović explained, the installation of a static frequency converter helped HPP "Bajina Bašta" work more efficiently in several aspects.

"I am proud to say that the static frequency converter has been successfully commissioned, and we expect to have the results as planned. We planned the savings around 6 GWh on an annual basis, primarily based on increased operational readiness of hydropower units. In situations when the hydrological situation is favorable, EPS will be able to use the water available in the accumulation much more efficiently", Jevremović points out.

He explains that any such project is important given the current energy situation in Europe, which requires greater investment in renewable energy sources, but also the fact that domestic energy still heavily relies on coal.

"The strength of the SFC and the scale of the project in Bajina Bašta make this HPP practically unique in Europe. This project is also special for ABB, and we are proud to have been a part of it with EPS. EPS announced the construction of another large reversible hydropower plant, and there is also the HPP Đerdap 3 project, which will most likely have an accumulation. We hope that we will help EPS increase the share of RES in the entire production and make sure that such power plants are the most modern and efficient as possible", our guest said.

ABB cooperates with practically all industries and most industrial consumers in Serbia. These days, a local campaign to improve energy efficiency will be launched through various energy assessments, especially ABB Ability™ energy assessments, and Jevremović expects that many companies will join or express interest in this campaign.

Maximum savings thanks to digital energy estimation

ABB provides its customers with the latest technologies, products, and services and introduces innovations for even greater efficiency. In addition to traditional products, energy-efficient motors or frequency-regulated electric motor drives can also contribute to energy efficiency, especially for pump and fan drives. ABB also provides energy assessment services at various levels that can represent basic energy assessments that require engineering and measuring. Since May this year, a new type of service has been offered that combines energy efficiency and digitalization.

ABB's digital power consumption assessment service for electric motor drives will rely on data from digitally connected electric motors and variable speed drives (VSDs) to determine where and how large savings can be made using the latest high-efficiency technology.

We call this digital energy assessment. It allows us to further and better analyze electric motors and propose the best solutions for our customers, both for complete factories and parts of electric drive. In this way, our customers can maximize energy efficiency, improve profitability, and reduce CO_2 emissions, Jevremović explains.

According to him, it is no longer enough to increase energy capacities, whether renewable or fossil fuels are used. Still, we must turn to energy efficiency that will ensure that our plants and households continue to function normally but with less consumption.

Increasing the capacity of renewable energy sources, although crucial for climate change mitigation and energy independence, is not likely to happen "overnight" and it is therefore important that we do everything in our power to preserve the environment and reduce costs. Hence the energy efficiency, our guest concludes.

Prepared by: Milena Maglovski

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MUNICIPALITY ON THE PATH TO GREEN TRANSFORMATION AND ECONOMIC DEVELOPMENT

In the central part of Serbia, there is a settlement of medieval origin – Lapovo. By royal decree, once a large Serbian village, in 1896, it was declared a small town. Today, it is divided into two parts, the Upper, through which the Constantinople Road passes, and the Lower, through which the Svilajnac Road and the Belgrade-Niš-Skopje-Athens railway

The municipality of Lapovo, formerly known as Hlapovo valley, is located between three rivers, the Great Morava, Rača and Lepenica, and at the crossroads connecting Central Europe and the Middle East. It has an exceptional geographical position, making it a dynamic economic development scene.

However, as we cannot talk about development today without adding the adjective "sustainable", we were interested in how the municipality of Lapovo harmonizes the large influx of domestic and foreign investors with measures for environmental protection. We talked about this with the mayor of Lapovo, Boban Miličić.

EP ***Environmental protection is recognized as a priority worldwide, so investments in renewable energy sources, afforestation and the fight against pollution are increasing. How important is this issue for the Municipality of Lapovo?***

Boban Miličić The issue of environmental protection is of great importance everywhere in the world and, therefore, in the municipality of Lapovo. The transition to the use of renewable energy sources and a responsible attitude towards the environment, in general, is very important, both for us and the generations to come. The energies of the sun and wind are inexhaustible and should definitely be used according to the budget possibilities. One of the ideas that our municipality is guided by is the afforestation of locations where it is feasible.

EP ***Air pollution is undoubtedly the biggest environmental problem in Serbia, especially in the winter months when the concentration of suspended particles is several times higher than it is allowed. How is the Municipality of Lapovo dealing with this problem? Are there plans to replace fossil fuel furnaces with those that use environmentally friendly energy sources?***

Boban Miličić Air pollution is a big environmental problem, especially in winter. One measurement conducted on the municipality's territory showed that in the winter months, the use of fossil fuels leads to increased air

BOBAN MILIČIĆ, president of the Municipality of Lapovo, was born in 1987 in Smederevska Palanka. He was educated in Kragujevac and Niš, where he completed his undergraduate and master's studies. He was elected a member of the Municipal Council in 2015, and in 2016 he became the president of the Municipality of Lapovo. He is married to Jelena, and he has a son, Dušan.

pollution, especially in the center of Lapovo. As there is no continuous monitoring of air quality in the municipality of Lapovo, the first and necessary step that needs to be implemented to determine air quality is its monitoring.

To influence the environmental awareness of citizens, this year, the municipality of Lapovo signed an agreement with the Ministry of Mining and Energy on co-financing the program of energy remediation of residential buildings, family houses and apartments, which will enable citizens to directly contribute to preserving the quality of the environment with own funds, state, and municipal subsidies. Implementing the planned energy efficiency measures will contribute to reducing the waste of existing energy and obtaining it from renewable energy sources.

EP ***More green areas guarantee healthier air and the restoration of biodiversity. How much is the Municipality of Lapovo dedicated to afforestation, and what can you tell us about the recent actions or those that await you?***

Boban Miličić On the territory of the municipality of Lapovo, with the help of socially responsible companies, afforestation action was carried out at several locations last year, and this trend is planned to continue in the future. The preschool and school institutions were also involved in the afforestation action, all to raise the awareness of young people about the importance of preserving the environment. Also, the municipality of Lapovo has repeatedly responded to the call of the NGO Green Development Center, which through the action "Plant your shade" gives free seedlings to citizens and thus conducted an organized distribution of seedlings to a large number of interested citizens.

EP ***Wild landfills "at every step" not only spoils the appearance of our country but also represents a serious environmental problem whose solution requires the engagement of all actors in the society. Are there any illegal landfills on the territory of the municipality of Lapovo, and how is this problem solved?***

Photographs: (background) Unsplash/Glauber Sampaio; (Miličić) courtesy of Boban Miličić

Boban Miličić The municipality is aware of the problem of the existence of illegal landfills. In accordance with that, it is taking appropriate measures to solve this problem. Every year, certain budget funds are allocated for cleaning existing landfills. Last year, the largest of them was partially rehabilitated, and the works continued this year. In cooperation with the company FCC EKO Ltd., which deals with waste management on the territory of the municipality, spring and autumn cleaning is being carried out.

In certain locations, large containers are set up to collect larger and bulky waste to make it easier for citizens to dispose of it and reduce the possibility of its disposal in unauthorized locations. Also, the municipality regularly fulfills its annual obligation to submit records of illegal landfills on its territory to the Environmental Protection Agency.

A significant contribution to the reduction of environmental pollution in this way is the donation of the Ministry of Environmental Protection in the form of 13 plastic containers with a volume of 1,100 liters and 490 garbage cans with a volume of 240 liters, whose use will also reduce illegal waste disposal.

EP ***How do you assess the waste management system in the Municipality of Lapovo, and is there a possibility for the implementation of a circular economy?***

Boban Miličić Waste management on the territory of the municipality of Lapovo, as I mentioned, was entrusted to the company FCC EKO d.o.o. The landfill itself is located on the territory of the municipality of Lapovo, and waste is also collected from the territory of the surrounding municipalities. The location of the landfill and the representative office of this company is important for the municipality of Lapovo due to the possibility of more functional cooperation. Still, it is certainly important to always upgrade the waste management system. What is necessary is to take a step forward in the primary selection of waste and improve recycling at the existing landfill.

> The municipality of Lapovo signed an Agreement with the Ministry of Mining and Energy on co-financing the program of energy remediation of residential buildings, family houses and apartments, which will enable citizens to directly contribute to preserving the quality of the environment with own funds, state, and municipal subsidies

EP ***Serbia is on track to transform its energy sector and increase the share of renewable energy sources by 50 per cent by 2040. Are there power plants in the Municipality of Lapovo that supply green kilowatts, and what can you tell us about the planned projects?***

Photograph: The municipality of Lapovo

Boban Miličić There are still no such power plants on the territory of the municipality of Lapovo. Still, the project-technical documentation for the construction of a solar power plant, which will cover 12 hectares, is being prepared.

EP ***The Government of the Republic of Serbia grants subsidies for energy renovation of buildings and installation of solar panels. Is the Municipality of Lapovo covered by these programs, and what is the citizens' response?***

Boban Miličić As I mentioned, this year, the municipality of Lapovo signed an Agreement with the Ministry of Mining and Energy on co-financing the program of energy rehabilitation of residential buildings, family houses and apartments.

The implementation of this Agreement on the municipality's territory will include replacing external windows, doors and other transparent elements of the thermal envelope. Thermal insulation of walls, ceilings above open passages, floors on the ground and other parts of the thermal envelope towards unheated space will be installed, and then thermal insulation will be installed under the roof, as well as the improvement of the building's thermal systems by replacing the system or a part of the system with a more efficient system. This will be done by replacing the existing boiler or furnace with a more efficient space heater, replacing the existing one or installing a new pipe network, heaters and accessories, installing heat pumps, and installing solar collectors and solar panels.

A public competition is underway for selecting economic entities that will perform the mentioned works, after which a public call will be announced, to which interested citizens can respond. We expect a great response regarding the existing interest of citizens related to this program.

EP ***In 2020, the construction of a wastewater treatment plant in the Municipality of Lapovo was announced. At what stage is the project now?***

Boban Miličić The project-technical documentation required for the construction of the wastewater treatment plant has been completed. It is currently being audited by the Office for Public Investment Management of the Government of the Republic of Serbia. After the audit, the Office will determine the funds needed for the construction of the plant and the sewerage network, all in cooperation with the Ministry of Environmental Protection.

EP ***The residents of the Municipality of Lapovo have the opportunity to spend warm days on the banks of the Great Morava, but do they take sufficient care of this river? How do you comment on the ecological picture of the Great Morava, and are the measures for its protection in force?***

Boban Miličić There is a weekend settlement by the Great Morava river, and its coast is one of the favorite places of the inhabitants of Lapovo, where they like to spend their free time. Also, fishing is represented here.

There are no concrete measures for the protection of the ecological image of the Great Morava, so the quality of the environment in that part of Lapovo is based on the awareness and conscientiousness of our citizens. There are waste bins along the river, and the municipality of Lapovo is certainly always ready to react appropriately if environmental problems occur.

Interviewed by: Milena Maglovski

Photograph: The municipality of Lapovo

WE ARE LOOKING FORWARD TO NEW RES PROJECTS

Reducing support for the fossil fuel industry and, on the other hand, understanding and supporting those sectors of the economy that have a significant impact on reducing pollution and climate change enable the financial sector to make a decisive impact in the energy transition. Erste Bank Serbia has so far financed more than 60 projects in the renewable energy industry (RES). Thanks to their credit support, 400 megawatts of capacity have been built that produce clean green energy from wind, water, solar, biomass and biogas. We talked about the market situation, projects and plans with Aleksandar Savić, Head of public sector and specialized lending department of ERSTE Bank.

EP ***Tell us more about RES financing projects in Serbia. What did the new law bring? How do you approach the selection of projects, and which projects do you finance?***

Aleksandar Savić When the first regulation on incentives for RES projects was adopted in December 2009, Erste Bank was practically a pioneer in their financing. The first project was financed in April 2010, and in accordance with its name (Erste, German, first – editor's note), we financed the first biogas plant and the first wind farm in Serbia.

Photograph: Erste Bank

All these projects are financed on the basis of feed-in tariffs adopted by regulations, and the legislative framework is defined within the Law on Energy. In April 2021, the first law dealing exclusively with the use of RES was passed (the Law on Rational Use of Energy and the Law on Energy Efficiency were passed in parallel), and solutions were implemented in most Western European countries.

The most significant change is certainly the transition from feed-in tariffs to the auction mechanism. For banks, the auction mechanism with a bilateral premium represents a similar level of price risk mitigation. Still, the achieved price at the auction is crucial for the successful implementation of projects.

So far, no auction has been held, but the first auction for wind farms was announced in November last year. The proposed starting price was 55.7 euros per MWh, and having in mind not only the current circumstances on the electricity market but also the expected trends, as well as the situation on the equipment market and the current level of investment, the offered maximum price was not adequate.

Another big novelty is the introduction of the producer-consumer institution, the so-called prosumer, into the legal framework. This has greatly opened up the tremendous potential for building new solar photovoltaic capacities.

> Independently or in cooperation with other financial institutions, we participated in the financing of over 400 MW from renewable energy sources, which represents over 80 per cent of the total capacities from RES in Serbia

When it comes to project selection, the process is quite complex. So far, we have financed over 60 projects of all types of RES available in Serbia, except geothermal ones.

EP ***How important is the support of KFW, the World Bank or the EBRD through funds, and how important is the support of our country?***

Aleksandar Savić The support of international financial institutions is of great importance. Most of these projects were implemented using the credit lines of these institutions, and in a large number of cases, these lines also carried a significant part of the grant component (grants).

As for the support of our state, it is the most important in the legal security of investment and simplified and expeditious administration.

When it comes to subsidies, it is necessary to take a more serious approach and look in the right way at what

ALEKSANDAR SAVIĆ has 17 years of banking experience. He is responsible for the portfolio of Erste Bank's largest clients in the field of energy. For the last seven years, he has held the position of Director of the Public Sector and Specialized Finance Department and, as he says, leads a team of the most professional bankers in specialized financing, especially for RES and EE projects.

constitutes their most rational use. Otherwise, we may find ourselves in absurd situations such as the fact that as a state, we subsidize the purchase of electric vehicles in the amount of 5,000 euros in a situation where they pollute significantly more than EURO 6 petrol and diesel vehicles due to the current energy mix.

EP ***What is the significance of the green energy sector and other forms of sustainable development for the banking sector in Serbia? What is new in this field in the bank's business policy? Does Erste Bank plan to provide additional capital to finance sustainable development in Serbia?***

Aleksandar Savić For most of the leading banks in Serbia, this sector is already very important and given the current circumstances and future expectations, I am sure that it will (if not already) become the most important because the issue of energy transition and sustainable development becomes the most important social issue. This trend must also be reflected in the way banks view the environment in which they operate, which inevitably results in changes or the introduction of new business practices and policies.

Clients will increasingly receive questions from banks that were not there before and may seem "non-banking" at first glance. For example, a natural person seeking a housing loan may be asked which energy class the property he is buying belongs to. The legal entity may receive questions regarding the amount of waste produced annually, fuel consumption, water and the like. I am sure that such issues in the future will determine not only the price of borrowing, but in certain cases, the possibility of the same. That speaks a lot about the significance.

EP ***What are the world trends regarding RES financing, and is Serbia on the right track? Can you single out some examples of good practice from Europe that we could copy in our country as well?***

Aleksandar Savić It may be hard to believe, but Serbia used to be a leading country in using RES. The first hydropower plant in Europe was built in Serbia (only 19 years

Photograph: courtesy of Aleksandar Savić

after the first hydroelectric power plant in the world, near Niagara). It is the SHPP "Pod Gradom" near Užice, which was put into operation in 1900, and is still in operation. We should not forget the hydro-capacities that were built during the last century. Unfortunately, due to various circumstances and factors, we are currently one of the least developed countries in terms of using RES in Europe. We still mostly (70 per cent) produce electricity by burning low-calorie lignite. We do not use the potentials we have in the field of RES. For example, in the Czech Republic, which according to almost all data, is comparable to Serbia (agricultural production, arable land, generated organic waste), over 330 MW of biogas plants are currently installed (by 2030, the plan is to reach 485 MW). In Serbia, it is about 30 MW - 11 times less.

I believe the market has already resolved the issue of return on investment. In this area, state support is not crucial (although the actual production price of electricity produced from coal and the price at which scarce electricity is procured are far higher than those at which adequate capacity from RES can be obtained). Still, efficient, cheap, and fast administration is certainly the part where the biggest progress can be made.

EP ***We believe that there are more and more requests for financing RES projects. Who can apply for funding? What is needed from idea to realization? Why Erste Bank, as a partner in RES/EE special financing projects in Serbia?***

Aleksandar Savić When the feed-in tariffs ceased to be valid, the market expected that the demands would "dry up". However, with the introduction of the institution of prosumer, and above all with the fact that energy has become an extremely sought-after and is now a scarce commodity, there has never been more demand.

Anyone interested can apply for funding. Erste Bank has specialized knowledge and products to respond to all types of requests, regardless of whether it is a request of a natural person who would finance a couple of kW of solar panels on the roof of its property or a wind farm project with an installed capacity of more than one hundred MW.

> The most important is that the bank understands the project, knows all the risks that the project carries, has the necessary knowledge to assess these risks, knows and respects market circumstances and is able to sufficiently and quickly adapt to them

Depending on the type and size of the project, it takes only a couple of weeks from idea to realization, and some large projects take years to develop.

Regarding the choice of bank, the most important factor is certainly that the bank understands the project, knows all the risks that the project carries, has the necessary knowledge to assess these risks, knows and respects market circumstances and is able to sufficiently and quickly adapt to them.

EP ***Which projects would you highlight as the most significant so far? Do you have data on the total amount of green energy in Serbia that was built thanks to the support of Erste Bank?***

Aleksandar Savić Erste Bank Serbia has so far financed over 60 projects in the field of RES. We financed small hydropower plants, biogas plants, solar power plants (both on land and roofs), and wind farms. Independently or in cooperation with other financial institutions, we participated in the financing of over 400 MW from renewable energy sources. It represents over 80 per cent of the total capacities from RES in Serbia. However, unfortunately, it is still a small percentage concerning the total capacities of electricity production in Serbia, so we are looking forward to new projects!

Interviewed by: Milica Marković

Photograph: Erste Bank

RES SERBIA

CONFERENCE
RES SERBIA 2022

15.09.2022. Metropol Hotel, Belgrade

DISCUSSION **PANEL:**

- RES due to the global security, economic and energy crisis
- auctions, price and electricity market
- aspects of environmental protection in the development of RES projects
- RES from the perspective of international financial institutions, banks and insurance
- NETWORKING - new contacts and business ideas

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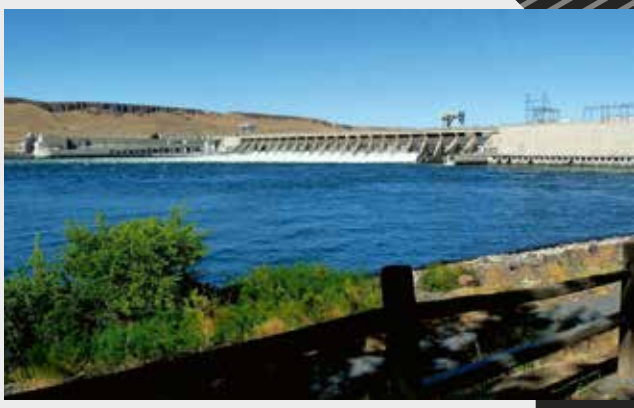
NORWAY HAS KEY OPPORTUNITIES TO ADVANCE ITS TRANSITION AND HELP LEAD THE WORLD ON CLEAN ENERGY TECHNOLOGIES



As a resource-rich country on the leading edge of many clean energy technologies, Norway is uniquely well placed for the clean energy transition and now needs to advance strategies to tackle emissions in sectors where they are hardest to reduce in order to meet its ambitious climate targets, according to a new in-depth policy review by the International Energy Agency.

Since the IEA's last policy review in 2017, Norway has remained a global pillar of energy security with its ample reserves of oil and gas produced in an environmentally responsible manner. Norway is a significant and reliable international supplier, exporting close to 90 per cent of its energy production.

Norway has updated its already ambitious climate targets with plans to reduce greenhouse gas emissions by 90-95 percent from 1990 levels by 2050, excluding carbon sinks. The country's robust carbon pricing system, under which 85 percent of domestic emissions are either covered by the European Union Emissions Trading System or subject to a carbon tax, provides a solid basis for delivering this goal.

Since the country has substantially electrified its energy demand and has already cut emissions from power generation to nearly zero, thanks to abundant hydropower, many of the easy wins for reducing emissions have already been achieved. The remaining reductions will be more complex, challenging and costly, notably in transport and industry.

Norway is already a leader in carbon capture, and its impressive Longship project, which encompasses two full-scale capture facilities and one storage facility in the North Sea, will further help to advance this technology for the world.

Source: IEA

BLUE ECONOMY CAN HELP MEMBERS BOOST OFFSHORE RENEWABLES

"An important part of the solution to today's energy crisis may lay with our oceans as a source of local and abundant renewable energy", said Roland Roesch, Deputy-Director of IRENA's Innovation and Technology Centre, at the fourth meeting of the Collaborative Framework on Ocean Energy/Offshore Renewables, "which also may foster a blue economy benefiting coastal areas and island territories. But we need to create the enabling frameworks to speed up its deployment."

Co-facilitated by Tonga and Italy, the virtual meeting was attended by 57 participants from 32 Members and States in Accession, as well as representatives of the industry and international organizations, including Global Wind Energy Council (GWEC) and Ocean Energy Europe. The meeting's purpose was to share best practices to accelerate the deployment of offshore renewables globally.

According to IRENA estimates, 2000 gigawatts (GW) of installed offshore wind capacity will be needed to keep the goal of limiting global temperature to 1.5°C and achieve net zero by 2050. However, this progress will not come without challenges.

Dorothea Damkjaer, Chief Advisor – Green Diplomacy and Climate, Ministry of Foreign Affairs, Denmark, introduced a new initiative to promote such a collaboration: The Global Offshore Wind Alliance (GOWA). Founded by Denmark, IRENA and GWEC, the complementary initiative has the ambition to create a global driving force for the uptake of offshore wind through political mobilization.

"GOWA intends to have a significant role in convening governments and industry to address issues pertaining to the deployment of offshore renewables and sharing best practices for overcoming obstacles. Its work streams will be determined by members' interest and willingness to collaborate. The aim is to achieve a total global offshore wind capacity of 380 GW by 2030, with 35 GW of annual new capacity on average each year across the 2020s," she added.

Source: IRENA

Photographs: Pixabay

LATVIA, AUSTRIA, SLOVAKIA HAVE EU'S LARGEST GAS STORES

After clinching a deal on mandatory gas storage last month, Latvia, Austria and Slovakia currently have the largest gas stores for next winter compared to annual consumption.

Slovakia, for example, has already filled its stores to 36 percent of its yearly consumption, data published by the association of gas infrastructure operators shows.

It also has a storage facility in Czechia connected to the Slovak distribution network. With these stores, Slovakia has more than half of the consumption covered and should survive the next winter without major restrictions even if Russia completely stops gas imports to Europe.

Within the EU, only Austria and Latvia have higher storages when not counting Slovak facilities in Czechia, although numbers are not known for Estonia and Lithuania. Austria has reserves equal to 43.3 percent of the annual consumption, while Latvia leads the EU with more than 78 per cent.

European Union negotiators agreed last month on mandatory gas storage obligations for EU countries, aiming for the bloc's stores to be at least 85 per cent full by 1 November 2022.

The agreement, which aims for storage to be shared between EU countries "in a spirit of solidarity", follows a winter of concern about low EU gas storage, high energy prices and disruptions in the supply of Russian gas.

Slovakia's economy ministry has previously announced that it wants to have enough gas in the storage tanks to last the next winter before the Nord Stream 1 pipeline is shut down for repairs. How long the reserves would last also depends on how cold the winter will be.

There is, however, a catch. Not all gas in Slovak storage tanks necessarily belongs to Slovakia. Any company, including foreign ones, can have gas stored. The government can, however, block this gas for the benefit of vulnerable consumers if needed.

However, the shutdown of Nord Stream 1 is expected in the next few days. Fear is that Russian President Vladimir Putin will use this shutdown to stop the imports completely. EU countries, therefore, prepare for the worst. Germany has already declared the second warning level of its three-levels crisis plan.

Germany has reserves filled only to 14.55 per cent. According to German Economy Minister Robert Habeck, the country faces the threat of industrial shutdowns if limited supplies do not improve by winter.

Source: EURACTIV.com/EURACTIV.sk

REPOWEREU A PLAN TO RAPIDLY REDUCE DEPENDENCE ON RUSSIAN FOSSIL FUELS AND FAST FORWARD THE GREEN TRANSITION

The European Commission has presented the REPowerEU Plan, its response to the hardships and global energy market disruption caused by war in Ukraine.

There is a double urgency to transform Europe's energy system: ending the EU's dependence on Russian fossil fuels, which are used as an economic and political weapon and cost European taxpayers nearly 100 billion euros per year, and tackling the climate crisis. By acting as a Union, Europe can phase out its dependency on Russian fossil fuels faster.

85 per cent of Europeans believe that the EU should reduce its dependency on Russian gas and oil as soon as possible to support Ukraine. The measures in the REPowerEU Plan can respond to this ambition, through energy savings, diversification of energy supplies, and accelerated roll-out of renewable energy to replace fossil fuels in homes, industry and power generation.

The green transformation will strengthen economic growth, security, and climate action for Europe and partners. The Recovery and Resilience Facility (RRF) is at the heart of the REPowerEU Plan, supporting coordinated planning and financing of cross-border and national infrastructure as well as energy projects and reforms.

The Commission proposes to make targeted amendments to the RRF Regulation to integrate dedicated REPowerEU chapters in Member States' existing recovery and resilience plans (RRPs), in addition to the large number of relevant reforms and investments which are already in the RRPs. The country-specific recommendations in the 2022 European Semester cycle will feed into this process.

Source: European Commission

Photographs: Pixabay

TRAVEL WITH KLM WITHOUT A GUILTY CONSCIENCE

We all look forward to travelling, whether for business or pleasure but in moments of relaxation or warming up for an important meeting, few people will think about the carbon footprint of their vehicle. Driven by daily responsibilities, I often forget how much fossil fuel vehicles pollute the environment until the black smoke of the car in front of me catches my eye.

However, as staying in a beautiful place can make stress and fatigue disappear but not climate change, our conscience tells us to combine the beautiful and the useful – travel and ecology.

Finding an environmentally friendly alternative to conventional vehicles is not always easy. For short destinations, there is a train, but if you wish to visit Paris or Amsterdam, traveling by rail, which can take several days, is not a particularly tempting option.

And what do we do now? We live fast and are in constant motion, so we are forced to use air transport as one of the fastest and safest modes of transport. However, there is a difference in the airline you travel with because while some do not deviate from traditional fuels, others can boast a high index of sustainable development.

One is the Group Air France – KLM, which works tirelessly to reduce carbon dioxide emissions.

Although they form a group, each of these companies has its programs that they have launched to protect the environment and reduce their environmental footprint.

KLM, as the oldest company in the world that still flies under its original name, has launched programs related to environmental protection. Within the "Fly Responsibly" initiative, which reduces, replaces, or compensates for the impact on the environment, there is the program CO2ZERO (naturalization of carbon footprint and pollution caused by KLM flights) and SAF Program (SAF – Sustainable Aviation Fuel), which includes work on the development of sustainable aviation fuel and its use in aviation, sets them apart from other companies in this industry.

Flying with KLM is no longer a pleasure solely because of comfort, reliability, and speed but also because of the knowledge that by traveling with this airline, I contributed to the protection of the environment, which, although it must not remain the only one, is by no means negligible. My recent trip to Amsterdam only confirmed this thesis.

High-level ecology

Observing the sea of clouds as I flew from Belgrade to Amsterdam, I remembered what it used to be like to travel with all the renowned airlines that today have become almost low-budget, but not KLM.

That is why I am not surprised that they were the winners of the APEX award in December last year, as the airline with the best service in the world, according to passengers. In addition to health protection, service, comfort, in-flight service, as well as the professionalism of employees during the summer were also assessed. And everything is just like that, at a high level, as it used to be.

Even those for whom environmental protection is the least important thing will undoubtedly enjoy the top service on the plane, free internet exclusively for sending messages via Viber and WhatsApp applications, and food and drink included in the ticket price.

If you are not one of those who doze off on a plane, free internet will make the time fly by in correspondence with dear people. Your internet access will also be important for the person who is impatiently waiting for you because it will shorten the boring time spent at the airport.

On top of all that, KLM offers you essential information at all times, so you can see at what altitude and speed you are flying and what kind of weather awaits you at your final destination. It was interesting to follow all these data, which were especially useful for me since I was greeted by rain in the city of tulips, but also since I did not have that opportunity on the flights of other airlines.

Delighted with the flight and the service, I began to share my impressions with people who fly often and explore other ways. Apart from the programs mentioned above that are pretty important, this company contributes to nature protection.

I was utterly taken aback and decided to put my impressions on paper.

Flying with KLM is no longer a pleasure solely because of comfort, reliability, and speed but also because of the knowledge that by traveling with this airline, I contributed to the protection of the environment

An airline that encourages you not to fly

At the very beginning of the text, I mentioned that the railway is imposed as a means of transport with the most negligible impact on nature, and KLM knows that.

Putting conscience and care for the environment before profit, KLM does one incredible thing for the airline – it encourages passengers not to fly but to replace short-haul flights with rail. In cooperation with the Dutch government, KLM supports a long-term plan to replace flights of up to 700 kilometers with high-speed international trains, such as destinations to Brussels, Paris, London, Frankfurt,

Photographs: KLM

According to the Dow Jones report for 2019, Air France – KLM Group is the airline with the highest sustainable development index and a leader in sustainable business in the aviation industry. In 2019, the Group reduced its carbon dioxide emissions by 31 per cent per passenger per kilometer compared to 2005, while the inevitable carbon footprint was significantly compensated. Flights with Air France – KLM Group are now accompanied by 31 per cent less non-recyclable waste and 43 per cent less pollution

Dusseldorf, and Berlin. Fortunately, this is not a film about superheroes but an example of a responsible and sustainable business that guarantees us the comfort and lifestyle we are used to while respecting all environmental standards.

According to the Dow Jones report for 2019, Air France – KLM Group is the airline with the highest sustainable development index and a leader in sustainable business in the aviation industry. Everything they have done in the sustainability field exceeds the capacity of this text, and I will mention only the most important ones that have made me no longer have a dilemma as to which company I will fly.

Namely, in 2019, the Group reduced its carbon dioxide emissions by 31 per cent per passenger per kilometer compared to 2005, while the inevitable carbon footprint was significantly compensated. Flights with Air France – KLM Group are now accompanied by 31 per cent less non-recyclable waste and 43 per cent less pollution. Of course, all with the use of biofuels.

The planet is surrounded by an ocean of clean air (oxygen). Each jet consumes up to 120 tons of atmospheric oxygen when flying over the ocean, which would be about 0.004 per cent of that air per capita. If this calculation is complicated for you, we can do this: the airline industry is currently responsible for two to three per cent of total CO_2 emissions. And that's because it uses fossil fuels.

That is why KLM's primary goal is to focus on the sustainable future of the aviation industry and reduce CO_2 emissions by 50 per cent by 2030 compared to 2005.

STEPS TOWARDS SUSTAINABLE DEVELOPMENT:

1. **Fleet modernization – 20 per cent less carbon dioxide, 25 per cent less fuel and 40 per cent less noise**
2. **Development and use of biofuels (SAF) – made exclusively from renewable sources whose use can reduce CO_2 emissions by as much as 80 per cent**
3. **Compensates for its carbon footprint – provides funding for planting over 1,000 hectares of tropical rainforest in Panama and allows travelers to, if they wish, make up for the CO_2 emissions associated with their trip**
4. **Reduce waste – recycle flight waste, primarily PET and turn it into filaments for 3D printers, using them to make parts for aircraft repair and maintenance**

Although the paper endures everything, I will leave some more interesting initiatives for the next issue. I hope that this small part was enough for you that the next time you choose which flight to go on, consider and opt for Air France – KLM because you are certain that you are contributing to the reduction of our planet's pollution!

Prepared by: Nevena Đukić

S STANDS FOR SOLAR POWER, STABILITY, SUN

Who would have thought that in the 21st century, we would face an energy crisis whose end is still not in sight, which has caused trouble to even the most developed economies in the world? It is clear that there is no time to wait – industries, households, and public energy companies must turn to renewable energy sources as soon as possible and ensure energy independence and stability as well as survival in times of crisis like this.

Every kilowatt of green energy, whether a few solar panels on the roof of a house or large solar farms leads us closer to the goal that by 2040, the share of renewable energy sources in the energy mix of Serbia will be 40 per cent.

MT-KOMEX makes sure to carefully select the solar panels and all the accompanying equipment of the solar power plant to maximize the solar potential of the facility

The domestic company MT-KOMEX, which is soon celebrating its thirtieth birthday, greatly contributes to the energy transition goals. They help citizens and companies step into the world of solar energy, start producing electricity themselves, and significantly reduce electricity bills.

MT-KOMEX has many satisfied customers whose roofs and estates are now equipped with solar panels from renowned global manufacturers. The list of locations is expanding every day, and we will try to present what the whole process looks like in practice.

Photographs: (top) Pixabay/Alex Csiki; (middle right) MT-KOMEX

Construction in two phases for over one megawatt of solar energy

For example, the last solar power plant completed by MT-KOMEX was built in two phases, the first with a capacity of 490 kW and the second with 600 kW. The construction of the first phase was preceded by a careful assessment of radiation on the horizontal plane, which ensured optimal conditions for the construction of the plant, as well as a thorough analysis of the roof. The new 490 kW of solar capacity will provide the investor with 596,700 kWh of green electricity per year. The return of the invested 330,000 euros is expected in six and a half years, and the cost for the maintenance of the solar power plant will be 500 euros per year. And that's not all; the mentioned investment will provide benefit to the client of the company MT-KOMEX and the entire society, since the CO_2 savings will amount to 477,360 kg per year.

An engineer at MT-KOMEX, Ivan Kićanović, explained that every construction site brings new challenges that need attention, but that a well-coordinated team solves all obstacles in the shortest possible time and with the best results.

"In this particular case, well-arranged roof surfaces were a mitigating circumstance for installing photovoltaic panels themselves, while a slightly longer DC and AC distribution was performed without major problems. The power plant was built and put into operation before the scheduled deadline, so we can certainly say that we have met the client's expectations", says Kićanović.

The second phase of stronger capacity was built within the same power plant but on a facility that is slightly away from the facility where the first phase was built.

For an additional 600 kW of the solar power plant, 454,223 euros have been invested, and the expected annual production will be 751,093 kWh. The maintenance costs here are 500 euros a year, while the return on investment is expected in about six years. The second phase of the solar power plant brings benefits in the form of annual CO_2 savings of 600,639 kg.

Equipment is important

MT-KOMEX takes care to carefully select the solar panels and all the accompanying equipment of the solar power plant to maximize the solar potential of the facility.

Every power plant is different, and in the specific case mentioned, MT-KOMEX engineers opted for 1,458 single-crystal Canadian Solar Half-Cells 370W solar panels for the first phase and 1,632 Luxor Solar single-crystal solar panels LX410M/182-108+(410W) for the second phase. For both phases, Fronius inverters, AC distribution cabinets, a monitoring system and "Smart meter" smart meters were used as additional indispensable equipment that makes this solar power plant maximally efficient.

IVAN KIĆANOVIĆ graduated from the Faculty of Electrical Engineering, University of Belgrade, majoring in Energy and completed his master's degree at the same faculty in Renewable Energy Sources. In the company MT-KOMEX, he is engaged in designing and constructing solar power plants. At the same time, he has previously gained work experience in constructing and reconstructing substations.

When maximum attention is paid to every detail of the solar power plant, the result will follow: "According to the client, and according to the monitoring system which shows that the power plant produces electricity greatly, we can proudly confirm that the client is satisfied. In addition, he has already recommended us to new clients", says Kićanović.

He adds that over 80 solar power plants built by MT-KOMEX will soon be joined by another in Novi Sad. With a power of 1,140 kW, the power plant is in the final phase of construction. When it is put into operation, its production will contribute to saving a total of 1,020 tons of CO_2, our interlocutor explains.

Firmly believing in a sunny future, MT-KOMEX continuously builds solar power plants diligently, thus building a future with no air pollution and electricity shortages. Over 100 satisfied customers and more than 20 MW of installed capacity of solar power plants speak for themselves, and this seems to be just the beginning for the MT-KOMEX expert team.

Prepared by: Milena Maglovski

Photographs: (Kićanović) courtesy of Ivan Kićanović; (bottom right) Pixabay/Daria Nepriakhina

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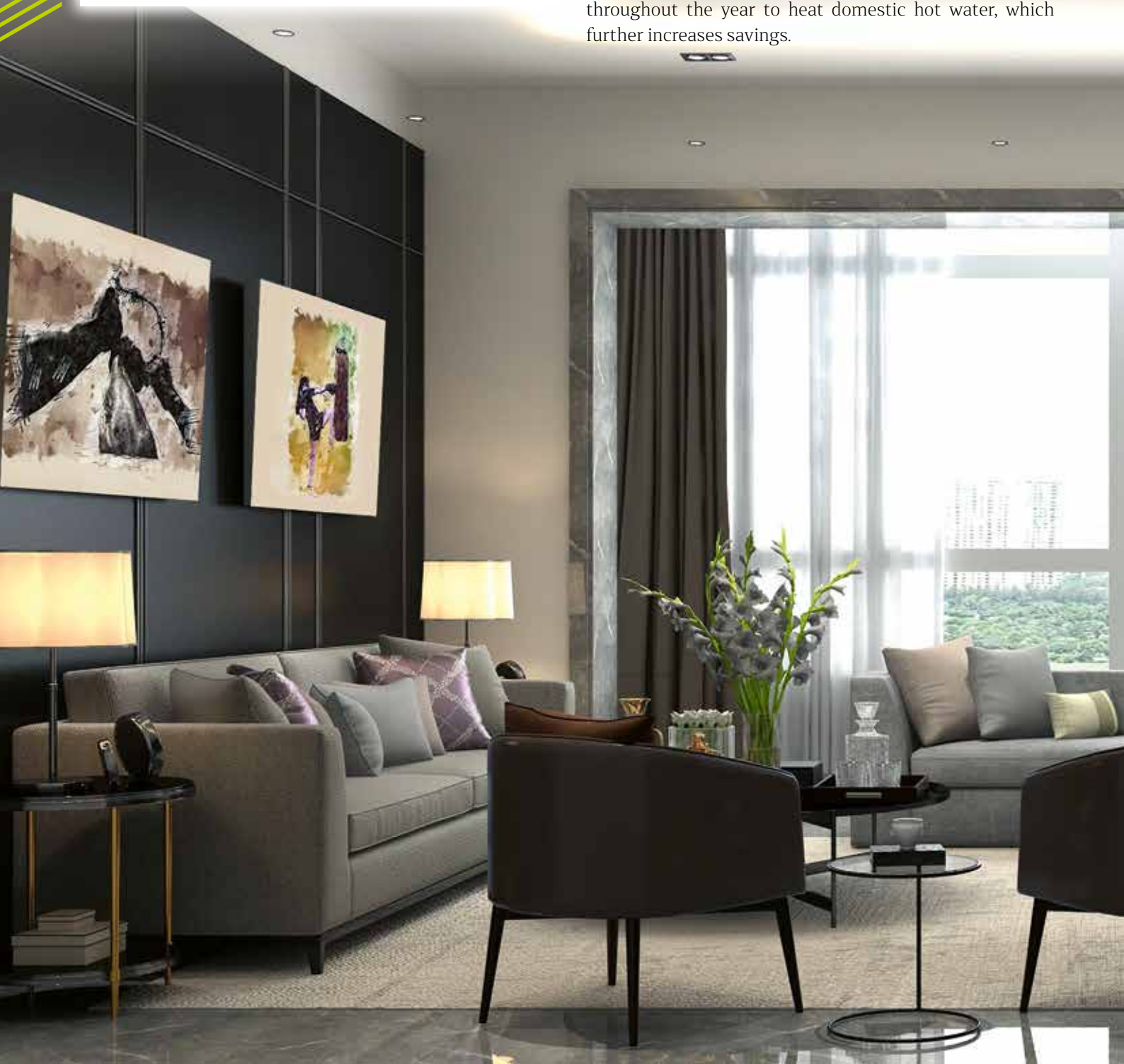
HEAT PUMPS – A SAFE SOLUTION FOR SAVINGS

Whether you heat your home with electricity, wood, or gas, or you have central heating, the market situation is so uncertain that you can't even assume how much heating will cost you next winter. That is why many have already started preparing for cold days now when the tropical heat begins. Many are looking for a long-term solution so that they can calmly welcome the winter without fear of imminent price increases.

Heat pumps are a great option for users who want to save money and the environment from negative impact.

For starters, don't let the name "heat" fool you. It is used for heating but also for cooling. It works on the principle of transferring thermal energy from one space to another. This means it cools the rooms of your home in the summer and heats them in the winter. In addition, it can be used throughout the year to heat domestic hot water, which further increases savings.



Heat pumps use energy from air, groundwater, or earth. Therefore, they have a minimal impact on environmental pollution. They only need a minimum amount of electricity when they need to start the pump compressor. For 1 kWh consumed, the heat pump produces 2-6 kWh of energy for heating or cooling.

For example, for a 40-square-meter apartment heated by a heat pump with a geothermal water supply, the monthly electricity bill would be 1,000 dinars. The bill for central heating of the same apartment would amount to around 5,000 to 6,000 dinars per month and is paid throughout the year. Electric and gas heating is even more expensive, and it is especially worrying that it is not known how much these energy sources will cost.

Tests of the land on which the construction of the building is planned are being done more often, showing the potential of heat pumps. First, it is checked whether there are geothermal waters and possibilities for installing heat pumps.

Also, heat pumps are very suitable for houses with a well. The test determines whether there is groundwater and if it turns out there is, then it makes perfect sense to install this system because despite the initial high costs, the return on investment will be realized in two to three years.

ProCredit Bank pays special attention to renewable energy sources and energy efficiency investments. Environmental protection is one of the main priorities both for the bank and its clients.

ProCredit Bank's energy efficiency loan is designed so that citizens can get a return on investment of up to 20 per cent. Funds in the amount of up to 600,000 dinars can be used for the installation of heat pumps.

You can apply for energy efficiency loans online; ProCredit Bank experts are there for all questions, while additional information can be found on the bank's website.

Photograph: Pixabay/Hansuan Fabregas

CONFINDUSTRIA

THE TRANSITION TO A GREEN ECONOMY WILL SHAPE THE FUTURE OF THE ENTIRE REGION

The international conference "Energy in the Balkans: Transition to Renewable Energy Sources and Improvement of Energy Networks" was held on 10th May at the Mona Plaza Hotel in Belgrade, with the participation of a large number of officials and experts in the energy field

The conference was organized by Confindustria Serbia and Confindustria Est Europa (Eastern Europe), in cooperation with Confindustria Italy, and it was inaugurated by Patrizio Dei Tos, President of Confindustria Serbia, Barbara Beltrame Giacomello, Vice President in charge of the internationalization of Italian companies in Confindustria, Maria Luisa Meroni, President of Confindustria Est Europa, H.E. Carlo Lo Cascio, Ambassador of the Republic of Italy to Belgrade, H.E. Emanuele Giaufret, Ambassador and Head of the Delegation of the European Union to the Republic of Serbia and Prof. Zorana Mihajlović, PhD, Deputy Prime Minister of the Republic of Serbia and Minister of Mining and Energy.

Patrizio Dei Tos, president of Confindustria Serbia, said he would like to share his view on the future of our companies and wondered whether the solution was procurement from different sources or proper production according to the green model. Barbara Beltrame Giacomello, Vice President in charge of the internationalization of Italian companies in Confindustria, emphasized that "the energy transition can lead to improved competitiveness of companies, raising awareness of the challenges and opportunities of the progressive and necessary transformation of economic systems".

Maria Luisa Meroni, President of Confindustria Est Europa (Eastern Europe), said that over the years, many Italian companies have invested and developed economic ties in this territory and found a suitable environment, not only in business but also in the territory where they operate and its key interlocutors. "Some of the most important Italian companies in the energy sector have developed cooperation that has contributed to the implementation of important projects for the development of the local market and strategic ties between Italy and the entire region", she said.

H.E. Carlo Lo Cascio, Ambassador of the Republic of Italy to Belgrade, said that the difficulties with basic raw

materials, the unpredictability of the market and extremely high prices of energy products affected, to a large extent, the speed of reconstruction after the pandemic we had hoped for. "The issues that connect Serbia and Italy are insufficient energy supplies at the national level, which requires us to make strategic decisions and plan investments in the long run", said Ambassador Lo Cascio.

H.E. Emanuele Giaufret, Ambassador and Head of the Delegation of the European Union to the Republic of Serbia, emphasized the importance of the European way. Deputy Prime Minister and Minister of Mining and Energy, Prof. Zorana Mihajlović PhD, said that energy, especially the RES sector, is the most important for economic development, investments, and new jobs, especially in times of crisis. She pointed out that energy security in the coming decades is impossible to plan without concern for the environment, cooperation, and connection.

"Together with the investors, our partners from Italy and the Ambassador, we will discuss improving bilateral relations and cooperation in the energy sector. Since 2009, Serbia and Italy have been strategic partners. Italian companies employ close to 50 thousand people in Serbia, but it is important to increase investments in energy, primarily in RES", Mihajlović said.

The keynote speakers were the Regional Head Energy Europe for Western Balkans and Croatia at the European Bank for Reconstruction and Development - EBRD Francesco Corbo and Nikola Vuletić, President of the Executive Board Unicredit Bank Serbia.

The speakers at the first panel, "Energy transition: transition to renewable energy sources" were: the Minister of Energy and Mining in the Government of the Republic of Srpska Petar Đokić, State Secretary at the Ministry of Mining and Energy of the Republic of Serbia Zoran Lakicević, Adviser to the Prime Minister of the Republic of North Macedonia for Energy Viktor Andonov, Head of the Cooperation Department of the European Commission Delegation in Belgrade Nicola Bertolini, Regional Director for the Energy Sector of the European Bank for Reconstruction and Development – EBRD Francesco Corbo, and Expert for Energy Infrastructure from Secretariat of the European Energy Community Davor Bajs. The moderator of this panel was Dubravka Kosić from K&F law office.

The participants of the second panel "Electricity Price and Auction System" were Miloš Kostić, CEO of MT-Komex, Miloš Colić, Director of New Energy Solutions, Neda Lazendić, Director of WV International Serbia, Miloš Mladenović, Executive Director of SEEPEX AD Belgrade, Ana Gašparovski, Member of the Board of Directors of the Association for Biogas and Dejan Popović, President of the Council of the Energy Agency. The moderator was Petar Mitrović, lawyer and partner at Karanovic&Partners office.

At the third panel, "Gas pipeline development, security and regional connections", the speakers were Milan Zdravković, Executive Director of the Distribution System Operator Srbijagas, Plamen Dilkov, Director of Bulgaria Engineering and Nikola Delev, Acting Director for Strategic Planning and Development Bulgartransgaz. This panel was moderated by Miloš Zdravković, an expert in the Energy field.

Alessandro Minon, President of Finest and Michele Picolato, Head of Plenitude Regulatory Affairs, addressed the audience afterwards.

Svetlana Cerović, Head of Finance and Advisory Department of UniCredit Bank, Željko Đurić, General Manager of the Balkan Wind Power Plant, Dubravka Đedović, Member of the Executive Board for Economic Affairs and Investment Banking of NLB Komercijalna banka, Predrag Milenović, Member of the Executive Board and Director of the Division for Business with the Bank of Intesa and Vučko Vuković, Director of the Customer Service of General Electric Power, addressed at the fourth panel named "Energy Future of the Region". The moderator of this panel was Danijela Isailović, manager of the association The Renewable Energy Sources of Serbia.

The conference was attended by senior representatives of the region's governments, the institutions of the European Union responsible for energy, companies already operating in the Balkan region, and financial institutions that are necessary for a sustainable and efficient green transition. The conference was a regional event and allowed attendees to get more detailed information about the energy future of Serbia, Montenegro, North Macedonia, Bosnia and Herzegovina, Bulgaria, and Greece.

The current situation shows that world energy is experiencing a turnaround in the sector, with a significant impact on companies, and new opportunities for the business sector. In this sense, the decisions of different countries, both from a strategic and political point of view and the transition to a green economy, will have a fundamental role, in a certain sense shaping the future of the entire region, business opportunities and citizens' lives, was concluded at the end of the conference.

Prepared by: Milica Marković

Photographs: Confindustria

WHO ARE ENERGY MANAGERS?

Have you heard of Energy Managers? Do you know what they do and their role in the processes of the energy transition, improving air quality and environmental protection in Serbia? Do you know that their job is not just technical? Their work is not only numbers, calculations, and measures to improve energy efficiency, but they also influence the entire community by creating better living conditions. By providing savings in fuel or electricity bills, money is provided for other needs: roads, schools, and kindergartens.

TANJA POPOVICKI has earned a Master's degree in Environmental Engineering and is currently working as a program manager at the RES Foundation in Belgrade. It deals with public policy issues in energy transition and climate change. She was engaged in international projects in environmental protection, sustainable development, and renewable energy sources during her career.

The job of energy managers involves constantly pointing out different solutions, helping and teaching others, both colleagues in the municipalities where they work and fellow citizens whom they help in choosing and deciding whether, when and how to start renovation and why it is important to adapt their homes to provide them with more heat and lower energy consumption.

The introduction of the energy management system began in Serbia more than 10 years ago. The system consists of various entities, individuals, and institutions: from the Government and the line ministry, through local self-government units, and at its very "end" are energy managers. According to the current laws in this area, an "energy manager is a natural person who has an energy manager license, appointed by the designed organization of the energy management to monitor and record the methods of use and quantity of used energy, propose energy efficiency measures and perform other tasks laid down by this law."

Every municipality in Serbia with more than 20,000 inhabitants is obliged to hire an energy manager. And perhaps legally at the "end" of the system, in practice, energy managers are often at the very beginning of the local energy system because, on the one hand, they are in direct contact with citizens and, on the other, have a very responsible task to actively shape local policies when it comes to energy, climate change and air quality improvement by pointing out more efficient, optimal and technically feasible ways to improve energy systems.

Energy managers, among other things, oversee conducting energy audits of public facilities, proposing measures to improve energy efficiency, and preparing a program to improve the energy efficiency of the municipality. In addition to these legal functions, in recent years, they have significantly followed the trends regarding new technologies, the introduction of renewable energy sources, and the replacement of fossil fuels with more environmentally friendly ones. To perform this job adequately, it is necessary to constantly improve, exchange knowledge and experiences with other colleagues, and gather information, evidence, and guidelines. Therefore, in the energy transition process in which we are currently, the energy managers are in constant transition. In addition to referring colleagues and interested citizens, perhaps an even more significant challenge for energy managers is directing public policies and advocating among decision-makers about what measures should be introduced, why they are necessary and how important they are to further improve not only the energy system management but also related disciplines that are closely related to energy, such as air quality, environmental protection, better use of natural resources and nature conservation.

Therefore, when we talk about the energy transition, we must not leave out these professionals whose work contributes to the creation of a better, cleaner, and more efficient society on a daily basis. Their role is in the process of energy management, and the energy transition is becoming increasingly important. They are the bearers of change, in the process of constantly acquiring new knowledge and improving their skills to be available to provide their colleagues and fellow citizens with timely and adequate answers regarding measures to improve energy efficiency, reduce air pollution, replace household heating systems and public buildings, or the installation of solar panels.

Photographs: (previous page) Unsplash/Danist Soh; (Popovicki) courtesy of Tanja Popovicki; (bottom right) Unsplash/Appolinary Kalashnikova

charge&GO CHARGER NETWORK IS GROWING

charge&GO provides AC and DC chargers to the users

Traffic electrification is one of the key steps to reducing the use of fossil fuels and greenhouse gas emissions. More and more electric cars are used in everyday traffic, which is a good indicator that we are progressing in this very long and challenging process. To facilitate the purchase of electric cars (we all know that they don't come as a bargain), the Government of the Republic of Serbia, for the third year in a row, subsidizes their purchase. All those who decide to use this incentive to purchase new passenger and light trucks with exclusively electric drive can apply for 5,000 euros subsidies, while plug-in hybrids (with external electricity connection) with carbon dioxide emissions set at a maximum 50 g/km are granted 3,500 euros subsidies.

However, for drivers to participate in traffic without fear of an empty battery, it is necessary to develop a good public network of chargers. To get to their destination safely and timely, drivers today need to make a good itinerary, often guided by the map of available chargers.

Management of charge&GO came to a conclusion that some help is needed for electric car users, and they came up with the first regional digital platform and mobile application showing the map of the charger network.

Photographs: Bojan Džodan

This platform provides electric car drivers with access to a charging station as well as the ability to pay for the use of chargers through the app. On the other hand, companies can remotely manage their charger network thanks to this app. A number of services include charging control, charger performance monitoring, pricing, applicable restrictions, and charging session review. In addition to the network of chargers in our country, the users of the application have thousands of partner network chargers across Europe at their disposal.

The **charge&GO** team is working hard on building the infrastructure and their plan is to cover the entire territory of Serbia with a network of their chargers.

charge&GO provides AC and DC chargers to users. Some have already been installed and are at service to electric car users throughout Serbia. Others are in the design and installation phase, while an intensive search for good locations for installing electric chargers is ongoing.

Currently, the **charge&GO** network provides chargers on highways through Serbia at the toll plazas of PE "Roads of Serbia" Vrčin, Niš, and Horgoš, as well as at gas stations NIS Gazprom Neft and OMV, Big fashion shopping malls in Kragujevac and Promenada Novi Sad, and throughout the Fiat dealer network.

Domestic companies have shown greater interest in installing and integrating chargers on this platform. Many companies have already joined the **charge&GO** network, installing chargers in their parking lots, and making them available to drivers of electric vehicles. **charge&GO** app for iOS and Android allows you to see all the chargers in the network, their exact location, and availability.

Prepared by: Milica Radičević

THE IMPORTANCE OF BATTERY ENERGY STORAGE SYSTEMS IN THE ENERGY TRANSITION

The increasing demand of consumers to be supplied at all times with electrical energy to satisfy all their needs is one the basic causes for the complexity of an energy system. The growing consumption of electricity, as compared to the generation thereof, threatens the stability and operation of the overall system, resulting in voltage and frequency deviating from their nominal values.

The issue is additionally complicated by implementation of renewable energy sources and their growing share in the distribution grid. Taking into account their variable nature, specifically, the fluctuation in the electrical energy generation from these sources, the issue of voltage and frequency in the distribution grid is further complicated.

Namely, the initiated energy transition and putting an end to thermal power plants, that is, giving up combustion of fossil fuels for generation of electricity, is aimed to reduce greenhouse gas emissions, first of all, of CO_2. At the same time, the entire energy system is encountering a big challenge of stability and continuity of electrical energy supply.

It is generally known that thermal power plants are the pillars of stability of any energy system, whereas renewable sources are unstable factors of the same. In order to ensure a stable and sustainable transition of the electrical energy generation system from thermal power plants to renewable energy sources, the expert community agrees that the construction of optimal systems for energy storage needs to be included, along with the continued increase in the installed power of wind turbines and solar panels. Several technological solutions for electrical energy storage are

The battery energy storage system would support the transition toward complete abandoning of fossil fuels for electrical energy generation

nowadays used, such as: battery energy storage systems, compressed air, flywheel-operated hydro pumps (reversible hydro power plants). Taking into account the advantages resulting from the use of a specific technology, the battery energy storage systems are distinguished as front-runners, compared to other technological solutions. What makes the battery systems specific is their flexibility in operation, efficient construction (implementation), efficient cost-effective solution and, as the most important of all, quick responsiveness measured in milliseconds.

The battery energy storage systems are globally already present, with the installed power of more than 20 GW, while last month in our region a battery energy storage system of the installed power of 10 MW has been put into operation. The reason for connection of a growing number of such types of battery energy storage solutions include economic, environmental and technical benefits they provide. These benefits directly include the improvement of the quality of electricity, mitigation of voltage deviations, frequency regulation, load transfers, load levelling and peak decrease. They facilitate the integration of renewable energy sources, grid expansion and overall cutting down of costs of operational reserves and reduction of greenhouse gas emissions.

One of the positive examples in the region is the interest of the thermal power plant "Gacko" in the installation of the battery energy storage system. The thermal power plant "Gacko", in cooperation with the company Lidac, a domestic leader in the field of battery management, design and maintenance of battery systems, has developed a preliminary design for the battery energy storage system of the designed installed power of 30MW.

The reason for connection of a growing number of such types of battery energy storage solutions include economic, environmental and technical benefits they provide

Thus, the thermal power plant would reduce the amount of coal combusted for generating electricity during on-peak hours.

The battery energy storage system, positioned with conventional producers of electrical energy, would support the transition toward complete abandoning of fossil fuels for electrical energy generation. It is necessary to bear in mind that any erroneous assessment and designing could result in errors of misuse or incorrect position of a battery energy storage system, that could result in worsening the quality of electrical power in distribution grids, decrease in reliability and load control, and could also adversely affect the voltage and frequency regulation.

The need for energy storage systems, in particular battery energy storage systems, does exist. However, we should be maximally cautious when developing their designs and positioning so as to avoid worsening of the existing situation of the energy system and gain maximum positive features and opportunities provided by such battery energy storage systems.

Prepared by: Nevena Đukić

Photographs: (left) Shutterstock; (top) Lidac

DDOR ECO BG CAR SHOW – 66.416 VISITORS IN FOUR DAYS

After a two-year pause, the most important annual event in the car and motorcycle industry was all electrified and environmentally friendly; all-electric and hybrid novelties, as well as EV chargers, were shown under the domes of the Belgrade Fair

Four-day DDOR Eco BG CAR SHOW 07 and 14. MOTOPASSION exhibition was probably the largest auto-moto event of its kind in the world and the first event in Europe to be held after a two-year pause on Fair exhibitions. A bit shorter than before, fully adjusted to the new circumstances, 66,416 visitors visited the event. Concerning the current international situation in which the event was organized, the hosts and exhibitors, other commercial participants, business people, importers, and distributors, are all satisfied with this turnout.

As a reminder, the last time car and motorcycle lovers could enjoy the show with their beloved at the Belgrade Fair during the 54th International Motor Show, held in March 2019. The following one, which was supposed to be held in March 2020, was announced at a time as the largest automotive event of the time in the world and with numerous records in terms of the number of brands and premieres, and whose organization was brought to an end, was sadly

> The most expensive car shown was a "classic" Land Rover Defender tagged at 183,765 euros; the first one to be sold was a Mercedes EQS for mere 175,000 euros

Photographs: Belgrade Fair

Vehicles with environmentally advanced propulsion solutions were under the spotlight, along with electric cars and hybrids but new models with conventional drives, environmentally advanced under the highest environmental standards were also there

canceled due to the galloping pandemic just a few days before the grand opening.

Ever since, the international community has suffered and still suffers serious consequences of the pandemic, problems in international transport and communications, global problems in the automotive industry regarding the finalization of production, and other difficulties related to the Ukrainian crisis. The Serbian economy and market were not spared from any of this.

With the big picture in mind, the Belgrade Fair as the organizer, the Serbian Association of Vehicle and Parts Importers, and the company DDOR Insurance Novi Sad, as the general sponsor of this event, decided to keep up with the new trends and opportunities, with the very name of the exhibition, adapted the new exhibition concept for this event. The focus was on vehicles with environmentally advanced propulsion solutions, electric cars, and hybrids but also new models with conventional drives, which are environmentally advanced and with the highest environmental standards. The idea was to promote new technologies along with the existing ones and to shed light on those coming in the near future.

The fair was organized with a clear picture of expected reduced commercial effect in terms of vehicle sales caused by the lack of new vehicles on the market, but at the same time with great interest of experts and the general public for all models with the latest propulsion solutions. The concept and expectations were approved by almost all members of the Importer Association, so, given the exclusivity of this year's concept and spotlight on innovations, they decided to present an extremely large number of premiers, especially of electric vehicles, which were complete novelties with most brands.

Under the slogan "A natural number of spins", this most significant annual event in the automotive sector in this region and Southeast Europe gathered 210 car exhibitors, some thirty brands in total, including the premiere and 102-year-old MG (British-Chinese), currently the fastest

growing car brand in the UK. More than 140 different models, 48 new models, of which 36 were premieres, and 12 novelties were presented. There were as many as 36 with fully electric or full hybrid drive. Among the premieres and novelties, there were 25 or more than 50 per cent pure electric cars.

In the "Motopassion" part, named "All your passions at one place", some 50 exhibitors took part, who presented about thirty brands of motorcycles, ATV and other motor vehicles, with more than 80 exhibited models.

The most exclusive and most expensive models of most brands and categories were booked or bought by impatient and solvent buyers on the opening day of the show. The first one sold was the Mercedes EQS at 175,000 euros. And when it comes to price range, these most expensive ones ranged from 135,000 to 185,000 euros. For example, the most expensive Audi model was priced at 134,875 euros, while the most expensive car on display at the entire show was the "classic" Land Rover Defender with a 183,765 euros price tag, and yet it was also sold immediately. Although high, these prices don't come even close to the prices of the most expensive models we have seen before.

Potential buyers searching for bargains were also given a chance. Fiat offered the classic 500 L model at a starting price of 12,000 euros, Dacia Sandero Stepway was priced at 16,440 euros, while Citroën offered its electric model for

10,000 euros, but this model will not be available to customers until 2023.

The supporting industry sector had a chance to present itself with a rich offer of spare parts, oil industry derivatives, auto-haberdashery, cosmetics and tuning equipment, and a very interesting and useful exhibition of garage service equipment. The exclusive of this year's fair event, and in accordance with the main line of the exhibition program, compatible and supporting equipment for environmentally-friendly vehicles were promoted, for which a special product group was activated, covering the charger segment for electric vehicles.

The Faculty of Applied Arts also presented an experimental model of a solar-powered car at its stand, the Italian racing solar car Emilia 4, the work of our industrial designer Prof. Ph.D. Marko Luković. This segment was located in Halls 2 and 1A of the Belgrade Fair.

Banks, leasing, and insurance companies, as well as the financing sector in car dealerships, vendors, and distributors, also did their part, offering favorable financial conditions during the show to provide the potential buyers with more favorable lending conditions for the same money, benefits in additional vehicle equipment, extended warranty or service terms.

The specialty of this year's event, with good prospects to turn into a separate event, were the old-timers and different types of old cars, to which the entire Hall 3 of the Belgrade Fair was dedicated. The exhibition is organized by

Given the main theme, the promotion of compatible and related equipment for environmentally-friendly vehicles – chargers for electric vehicles, as well as solar modules for use in the automotive industry was held

thematic units, as a kind of parallel to the "neighboring" exhibition of the latest models, to give visitors the opportunity to travel through the time and history of the automotive industry. Some of the exhibits brought visitors back to the time between the two world wars and to the first fair exhibition of the Belgrade Fair. A special attention as an exclusive segment of this exhibition, in Hall 3A, was attracted by the retrospective of domestic products "Zastava", a thorough history of the decades-old backbone of the Yugoslav and Serbian car industry.

This entire auto-moto event opened the floor for various segments and accompanying programs, as part of which the National Driving Academy NAVAK performed daily training simulations of critical traffic situations and demonstrated the importance of ABS devices and braking exercises with obstacle avoidance, with and without ABS on slippery surfaces.

The "Puma Eco Car Conference 2022-PCC 2022" was held with three panels. The first one had "Hydrogen, CNG, LNG – supply and use potentials", the second one was named "Electric vehicles", while the third one dealt with "Infrastructure for electric vehicles". The thematic framework covered the perspectives and challenges in the automotive industry until 2030. The conference was organized by the Center for Electric and Hybrid Vehicles - CEHV, Faculty of Mechanical Engineering, University of Belgrade, Serbian Association of Importers of Vehicles and Parts, StudENTER, Journal of Applied Engineering Science – JAES, Project Land, Faculty of Technical Sciences Novi Sad, Serbian Chamber of Commerce, and co-organized by the Belgrade Fair. On this occasion, TAB Baterije Ltd., a company from Belgrade, organized the Presentation of lithium-ion batteries.

Considering the well-known international, geopolitical, communication, transport, market, production, and all other unfavorable circumstances and difficulties in which this event was organized, with a completely new concept and setting, the impressions after the gates were closed are more than positive. The Belgrade Fair did an excellent job of its organizational part of the work and proved to be a worthy and reliable support for the fair's activities on a wider international level.

Prepared by: Milica Marković

AN ACTIVE HOUSE FOR AN ACTIVE LIFE

An active house satisfies all the parameters of a healthy and economic life, which is especially important considering that today the average person spends over 90 per cent of his life indoors

Who could forget the floods in Serbia in 2014? Although the consequences were catastrophic, human solidarity, the sacrifice of individuals and the help of other nations were the beacon with which we came out of this challenging situation.

When the water began to recede and Serbia took on its former appearance, ideas for improving infrastructure and housing came to the fore so we could be ready for the unpredictable weather events in the future.

Since thousands of people have temporarily or permanently left their homes, there is an initiative on active houses that meet all the requirements of healthy and sustainable housing in our country.

Tatjana and Đorđe Stratimirović, pioneers of active houses in Serbia, explain for our magazine that these are prefabricated houses whose installation takes only two to three weeks and, in that sense, represent an ideal solution for emergencies. On the other hand, so that prefabricated houses intended for the endangered population would not be of worse quality than their previous homes or something that they will not need soon, an active house guarantees a healthy and efficient way of life even after a natural disaster.

Đorđe Stratimirović, director and part of the Novi Model research team, says that the active house has its roots in the Scandinavian countries, where the need for energy efficiency is especially emphasized. However, although energy efficiency is one of the basic criteria of an active home, the well-being of the occupants and the planet is equally important.

Tatjana points out that it is not enough to reduce the windows and clog even the smallest hole on the facade to ensure maximum energy savings. Due to the lack of daylight and fresh air, the family's life is losing quality.

An active house satisfies all the parameters of a healthy and economic life, which is especially important considering that today the average person spends over 90 per cent of his life indoors.

"The standard of an active house is alive, and there is an annual award given for the best projects. Such facilities exist in Greece, Romania, and Bulgaria in the region, and China last year adopted a new set of building standards that include active house standards. There are also standards for

Photograph: Novi model/Sanja Milanov

hotels and business premises and those that can be applied to facilities that have already been built", says Tatjana.

Legislation is the best way

The ecological side of an active house is reflected in the savings of electricity obtained from dirty sources and the use of renewable energy sources, and the selection of ecological materials.

However, there are few alternatives to standard building materials on the domestic market because the industry is not stimulated to apply environmental standards in its production.

"For the house's insulation in our conditions, Styrofoam is on offer, which is easy for contractors to work with. Although this material meets the energy efficiency requirements, all other criteria are not met. The material is carcinogenic, originates from the oil industry and emits toxic gases when ignited. Another option is glass or stone wool, which is a natural material. Still, its production requires a

huge consumption of dirty energy", says Đorđe and points out that this is why the state's support is necessary for the industry to switch to ecological materials such as straw, hemp, dried grass or reed.

Active house INTEGRA

Tatjana and Đorđe turned the acquired knowledge about active houses into a finished product for the domestic market – the INTEGRA prototype.

They have three products of different dimensions can meet the users' needs. The project comes with solar collectors, and the idea is that INTEGRA can be built on inaccessible terrains that do not have an infrastructure.

Although there are still no active houses in our country (except for the one installed in the factory), Tatjana and Đorđe hope that they will soon find a location for its installation and a partner who will enable them to test this project to the end.

"It is necessary that those who want such a facility on their property accept our solution with confidence because people still think prefabricated houses are poor quality. The

ĐORĐE STRATIMIROVIĆ is the founder and executive director of the Novi Model company. He is an expert in advanced statistical analysis of data from various complex systems. He passed all levels of education at the Faculty of Physics, University of Belgrade, including a Master's and Doctor's degree in the physical sciences.

TATJANA STRATIMIROVIĆ is an architect with extensive experience in architectural design and education, with a special knowledge of modern housing. She is currently working on an environmentally sustainable architecture related to climate issues and climate change. She has a doctorate in architecture and urbanism.

construction procedure is relatively simple – after obtaining all permits and the time required for the manufacturer to deliver all the components of an active house, field work takes two to three weeks", says Đorđe.

Our interlocutors agree that only a change in the awareness of housing can precede the affirmation of active houses and the introduction of its standards in legal regulations. It is important to understand that active homes do not belong only to the northern people but that we all deserve a healthy, safe, and sustainable home. The good news is that an active house is well on its way to settling in our country, and one such house is eagerly awaiting its location.

Prepared by: Milena Maglovski

Photographs: (middle left) Novi Model/ Sanja Milanov; (bottom right) Novi Model/Ana Stašić i Jelena Peljević

BIOGAS – RELIABLE ENERGY FOR A STABLE FUTURE

The deepening of the energy crisis has additionally encouraged the development and use of renewable energy sources. Energy independence is becoming a number one priority and could be achieved using domestic renewable energy resources. Biogas is one of the most important cornerstones of Serbia's energy independence. In a country where generations are engaged in agricultural production, a huge potential for biogas production definitely exists

Considering the available energy sources and agricultural potential in Serbia, a total of 500 MW obtained from biogas can be achieved without any problems. Biogas power plants operate 24 hours a day, 7 days a week, providing energy stability and balance to the entire system.

We talked with Lidija Carević from the Serbian Biogas Association about the current situation in our country regarding biogas, development potential, new technologies, and future plans.

EP ***When was the Serbian Biogas Association founded?***

Lidija Carević The Serbian Biogas Association is a non-governmental and non-profit association founded in March 2012, when the three owners of the first biogas plants got together in an attempt to achieve the best possible business conditions in this sector.

Today, the Association is a representative association that gathers about 50 members, biogas plants, and other institutions: equipment producers, a new line of investors in the biogas industry, universities, insurance companies, and consulting companies.

In cooperation with domestic and international institutions, the Association is working intensively on the professional development of its members regarding using renewable energy sources and managing biogas plants.

A special honor, but also an additional responsibility, was shown to us in 2020 when the Association got the approval from the Government to add the name of the Republic of Serbia to its name. Since August 2020, the Biogas Association has been called the Serbian Biogas

Association. In this way, we have become a biogas umbrella association in Serbia.

The Serbian Biogas Association is an active partner of the German Fachverband Biogas e.V. Association, and this partnership has been defined by many years of successful business cooperation. The Serbian Biogas Association is also a member of the EBA – European Biogas Association. We have the support of the Ministry of Mining and Energy, the Ministry of Agriculture, Forestry and Water Management, the Ministry of Environmental Protection, the Serbian Chamber of Commerce, and the Chamber of Commerce of Vojvodina.

EP ***What is biogas, and what is its potential in Serbia? Is biogas exploited enough?***

Lidija Carević Biogas represents a mixture of gases formed by the decomposition of organic matter in conditions without the presence of oxygen (anaerobic conditions). The formed mixture of gases mainly consists of methane (50-75 vol%) and carbon dioxide (25-50 vol%). In addition, biogas contains small amounts of hydrogen, hydrogen sulfide, ammonia, and other gases in traces.

The process of biogas formation is similar to the process of digestion in the stomach of ruminants, and this process is called anaerobic digestion. Biogas is generated from liquid and solid animal manure, organic waste and/or energy crops in a technological process in a hermetically sealed tank.

Biogas is produced efficiently under controlled conditions in plants called biogas power plants. Biogas can be used to produce electricity and heat (cooling) energy within

LIDIJA CAREVIĆ is the coordinator of the Serbian Biogas Association. She is actively working on strengthening and stabilizing the biogas sector in Serbia, both by attracting new investments and by creating better working conditions in this sector. She is currently the team leader in Serbia, working on the implementation of the second major project done with the German Biogas Association, Fachverband Biogas e.V. The project, set for a period of 3 + 3 years, is coordinated by Sequa gGmbH, from Bonn, is funded by the German Federal Ministry for Economic Cooperation and Development (BMZ).

The previous experience and knowledge gained throughout more than 10 in the agricultural sector is an integral part of her current job

Should the biogas plant shut down for any reason, it will take about six months for the whole process to stabilize and restart

Photographs: The Serbian Biogas Association; (Carević) courtesy of Lidija Carević

the cogeneration plant (CHP), for combustion, i.e., heat production, as well as for the production of pure methane (enriched biogas).

As a notable fact, it is good to know that in the Republic of Serbia there is still no legislation for the production of pure methane from biogas. As part of the fermentation end process, a high-quality fertilizer was obtained, which is allowed in organic agriculture, so we can say this is a complete process.

Serbia's potential in biogas production is huge. Considering that Serbia is an agricultural country and as much as 65 per cent of the Serbian surface is arable land, we are talking about a large amount of waste from farms, i.e., raw materials used to obtain biogas. Annual biogas production in Serbia is about 256 GWh/g.

Currently, as many as 34 biogas power plants are fully operational in Serbia. Given that we are a young market, this is an impressive figure. An indicator that the market is developing in the right direction is that we currently have as many as 81 plants in temporary status, which means that the sector will grow significantly in the next two to three years.

IS THE USE OF BIOGAS REALLY SUSTAINABLE?

"It is absolutely sustainable. The quantities of waste from which biogas is obtained are unlimited, i.e. waste is constantly generated on farms, and the use of biogas is absolutely harmless to the environment, with reduced greenhouse gas emissions. The use of biogas brings many benefits not only for the Serbian energy system but also for agriculture and ecology of our country", says Carević.

All electricity produced from biogas is distributed over to Elektrodistribucija (Electric Distribution Company) resulting from a contractual obligation. Presently, the obtained heat is used for the farms because no infrastructure could deliver this heat energy to end consumers. Accumulated heat is used to heat barns, dryers, greenhouses, and nearby institutions where the plant operates, namely kindergartens, health centers, and schools.

Biogas is not used enough, and there is a lot of room for improvement, especially when it comes to the use of thermal energy from biogas, not to mention the production of biomethane. Biomethane is already widely represented in all European countries, and right now, we are focusing on defining its application locally.

EP ***Plans for the future?***

Lidija Carević Within the biogas sector in Serbia, a lot has been achieved in a short period of time and a favorable business climate has been created for investors.

The market is stable, promising, and rapidly growing. Currently, 34 biogas power plants are operating successfully with a total installed capacity of some 33 MW. Our

forecast says that in Serbia, in the next two years, we will have over 100 MW of additional capacity installed in biogas power plants and that, in terms of biogas production, we will be far ahead of all countries in the region.

Most biogas plants have a capacity of 1 MW, and we in the Association are trying to promote the importance of building smaller biogas plants that could accept farm waste and create the best possible conditions for the operation of biogas plants.

The highest concentration of biogas plants is in Vojvodina, close to large farms, which means a sufficient amount of raw materials for the operation of the plant.

SAFETY

The use of biogas is safe, and it also has numerous benefits when it comes to the local community. As the process of obtaining biogas takes place in strictly controlled conditions, accidents are none. Special attention is paid to the protection of biogas operators and employees working at the plant.

EP ***What are the advantages of using biogas, is it harmful to the environment, and if yes, in what way?***

Lidija Carević The advantages of using biogas are numerous, and I would first mention the environmental benefits. The construction of biogas plants and biogas production solves the problem of disposing of biological and organic waste from farms. The farm waste, that is, the raw material for the operation of the biogas plant, used in the process of biogas production, gained a new economic value, both in the form of electricity and heat value and as organic fertilizer. In addition to the benefits mentioned above, the construction of a biogas plant has a number of benefits reflected in the development of the rural environment, creation of new jobs in the local community, gains in terms of financial stability for local farmers, balance to the power grid in rural areas, reduction of pathogens in manure, and as much as 90 per cent less unpleasant odors coming from farms. The benefits for the investor in the form of financial gain from the sale of electricity derived from biogas must not be forgotten.

Biogas is different from other RES, primarily because biogas power plants have the greatest contribution to environmental protection compared to other renewable energy sources. Their primary role is environmental protection. The production of electricity and heat, here, is, in fact, a consequence of the disposal of unused raw materials.

No waste substances are recorded in biogas production, and the only remnant is a high-quality organic fertilizer that is further used in agricultural production, so we can say that biogas production is an environmentally complete process.

The biogas production process is very complex and that also sets it apart from all other RES. Should the biogas plant shut down for any reason, it will take about six months for the whole process to stabilize and restart. Various experts, electrical and mechanical engineers, chemists, biologists, agronomists, veterinarians, and ecologists are involved in the process of obtaining biogas. Therefore, the path from inserting waste into the digester to delivering electricity to the mains is extremely demanding and complex.

EP ***How much are the citizens in Serbia aware of the biogas potential? What is the situation in terms of education?***

Lidija Carević We work on educating the decision-makers, farmers, future investors, and the general public. Our primary goal is to promote biogas and create an image of biogas as a form of green energy that is most benevolent to the environment and attract new investments in this sector.

We in the Association have provided a whole set of educational materials, such as professional brochures, a film about biogas, education materials, and a guide for investors. All materials are published on our website, and we are happy to share all the necessary information with those interested. We are also actively promoting the construction of small biogas plants.

Our message is that every village should have its biogas plant, primarily for environmental reasons. Our emphasis is on the fact that of all renewable energy sources, biogas has the most positive impact on the environment.

Interview by: Milica Radičević

A GREEN FUTURE IS IN THE USE OF SOLAR AND BIOMASS ENERGY

National Biomass Association "SERBIO" in cooperation with the German organization GIZ DKTI, organized the fourth international investment and practical conference entitled "Energy efficiency through the use of solar and biomass energy". The conference's agenda was divided into two main groups aiming to satisfy different interest groups. In the first hall, discussions and presentations were intended for companies, industry, population, and agricultural holdings, while the panel in the second conference area was dedicated to topics intended for public companies, heating plants, and representatives of local governments

The way to the solar power plant

The first steps for acquiring the "prosumer" status are formal legal aspects which include the Law on the Use of RES, the Decree on Criteria, Conditions, and Manner of Calculating Receivables and Obligations of "Buyers – Producers" and Suppliers, as well as the Rulebook on Content and Register of those connected to the transmission and distribution system which is still under review at the Ministry of Mining and Energy. All these issues were discussed at the panel where the speakers were Bernd Bollmann, on behalf of Viessmann Photovoltaic, then Filip Veljković, Green Watt, Obrenko Čolić, business process analyst for planning and investments in Elektrodistribucija Srbije and Nikola Grubor on behalf of CEEFOR.

Bojan Grujički from Viessmann, the general sponsor of the conference, presented the company's integrated solutions, also covering the field of solar energy. The answer to the question "Why the sun, why photovoltaics, and not another source of RES?" was given by Nino Sijerić, Business Development Manager at Luxor Solar. Both companies took part in the second panel dealing with solar technology and solutions, along with representatives of SKE Engineering GmbH and HUAWEI also presenting their products.

Solar and biomass energy will unite us

"Every year, the global economy consumes more than 90 trillion tons of natural resources (of which only 8 per cent is reused), which is equivalent to 1.7 of what the Earth can pro-

duce annually. Circular economy offers a new "product - waste – product" model, said Nataša Rubežić, president of the National Biomass Association "SERBIO" opening the topic of Circular Economy at the third panel of the conference attended by Djordje Marić on behalf of the Regional Association of Private Forest Owners Omorika, Predrag Stojanović, TEKNOXGROUP Serbia, then Zdravko Stipetić, Director of the EPC Sector Thermal Power Plants Ltd., Croatia.

Reconstruction and replacement of sources as a path to energy efficiency

At the panel named "Heat and electricity through solar and biomass energy for public companies, heating plants, and local governments", Sandra Nedeljković, acting Deputy Director of the Office for Public Investment Management, presented the investments of the Government of the Republic of Serbia in the production of thermal energy from biomass. Dejan Stojanović spoke on behalf of the business association "Toplane Srbije" about renewable energy sources and energy efficiency in district heating, who reported the fact that from 2015 to 2019, natural gas had the largest share of all energy sources in the production of thermal energy in Serbia. On behalf of the EBRD (European Bank for Reconstruction and Development), the panel was attended by Bojan Bogdanović, Manager of the Renewable Energy Fund in District Energy Systems, then Jelena Ilić, Viessmann Project Manager, Zdravko Stipetić EPC Sector Director from Đuro Đaković Thermal Power Plants Ltd. Croatia, and Sandra Nedeljković, acting Deputy Director of the Office for Public Investment Management of the Government of the Republic of Serbia.

Waste as energy raw material

Prof. Vladan Pešić, PhD from the Faculty of Agriculture, University of Belgrade, introduced the topic "Blockchain technology in the function of the green circular economy – for sustainable communal systems, heating plants, and biomass power plants". Professor Pešić also presented the project "Biomass Market Management Model as a Basis for Recycling Green Bio-Waste into Thermal Energy and Compost Fertilizers". Dušan Macura, Head of the Sector for Production and Distribution of Thermal Energy, JKP "Novosadska toplana", joined this panel as a co-speaker covering the topic of solar application.

How to finance all this, where to start and who to contact?

The final panel included several speakers, namely Bojan Bogdanović, Manager of the Renewable Energy Fund in District Energy Systems within the EBRD, followed by Ivan Smiljković, Member of the Executive Board of Procredit Bank, Aleksandar Savić, Director of Public Sector Affairs of Erste Bank, Director of Solaris Energy, Miloš Kostić, and on behalf of the Development Fund of Vojvodina, Jelena Trenkić, Assistant Director in charge of the sector for managing programs for financing climate sustainable projects. Panelists discussed present investments in RES projects, further plans, and public sector support.

Prepared by: Milica Marković

Photographs: SERBIO

STORIES ABOUT URBAN CITIES - BARCELONA AND VALENCIA

At the beginning of spring, I set out on a trip to my favorite country, perhaps the only one where I could live outside our borders – Spain. Thanks to the "Pulse of Europe – Media trips to EU" project, I saw Barcelona and Valencia from a different angle because I had not even thought about these topics in my previous visits. A great team of journalists from Serbia gathered so that they could share their experiences of sustainable transport with our dear fellow citizens

We often hear that our mentality is similar to the Spanish, and I always gladly agree with that statement. Somehow, I feel at home there, most likely because of their hospitality, smiles, kindness, and, I have to admit, nonchalance. Foreigners experience us very similarly. Of course, not everything is so rosy either there or here, but what definitely makes us different is the way we travel to work, meetings and shopping. They have something we can still only dream about – the subway, well-maintained bike paths, superblocks, and high-speed railways.

Henry Miller said: "One's destination is never a place, but a new way of seeing things." It is exactly what happened on this study trip. I realized that due to the highly polluted air in Belgrade, we could also apply, if not all, then at least some good ideas that are being realized in Barcelona, which is becoming a green city.

Superblocks – the future of Barcelona

The transformation of this popular tourist destination begins with Superblocks that are well-known by now, with which they want to reduce pollution by arranging new green areas, squares intended for recreation, and socializing, streets where pedestrians and cyclists have an advantage, and cars speed limits to an incredible 10-20 km/h.

Photographs: (top and on the next page) Curro Palacios

Thanks to Neda Kostandinović and Dani Alsina from the Secretariat for Urban Ecology of the City Council of Barcelona, we gained a complete insight into the city's present transformation.

The new ecological infrastructure will, in a unique way, encourage "life on city streets", sustainable mobility and local trade. As a result, the city will become greener, safer, and adapted to all residents. According to the plan, parts of the road will be turned into bicycle paths and promenades. The intersections will be turned into squares and places for rest, recreation, and socializing.

To check if everything worked as they imagined, the leaders of Barcelona made a case study. In the Sant Antoni district, they built a Superblock on a small area, which was completed in 2019. Since then, the level of nitrogen dioxide pollution in this area has been reduced by 33 per cent, and PM10 particles by four per cent, while the noise level has been reduced by four to five per cent. Cars seem to have disappeared; there are 82 per cent fewer of them in the block itself, while their number in the surrounding streets has increased by 22 per cent.

According to Alsina, the residents of this part of Barcelona replaced cars with bicycles, public transport, or, simply, they walk.

Encouraged by excellent results recorded in the Sant Antoni district, works will begin in July this year in the municipality of Eixample, which meets all the necessary criteria. In this part of the city, the air is very polluted, and there are a lot of cars, but it is well connected by public transport with other parts of the city.

As Neda Kostandinović, an architect employed in the city Secretariat for Urban Ecology in charge of promoting Superblocks, explains, every corner in Barcelona should be used and turned into a green area.

Neda has been living in Barcelona since 2009, she knows almost every corner of the city, and from the beginning, she was involved in the realization of this project.

The "first steps" were taken in the Poblenou district in 2016 to see if the planned transformation of the public space is feasible.

At the same time, they carefully followed the reactions of the citizens, who were anxiously watching what was

happening. "We received a lot of criticism, and people were quite divided. The merchants were the most worried. By involving citizens in the process of making design decisions and how the space will be used, we realize that they become aware they are part of the whole process and that their voice is important. A lot has changed and is shown by the fact that about 70 per cent of the inhabitants of Barcelona now support the Superblocks," Neda explains.

No wonder the viewpoint of the fellow citizens changed since they saw for themselves that the noise level had decreased, as well as air pollution, and the number of green oases had increased. Miroslav Milenković explained for the Energy Portal Magazine what it is like to live in a neighborhood full of greenery, parks and space for games and entertainment.

The Milenković family lived in Belgrade, but they went to Barcelona eight years ago because of work. Here, they have changed their address and the area where they live several times, but it seems that they have finally found their oasis of peace.

"For us, as well as for all family people, it means a lot that we live in an area where we can move freely. The idea is very interesting because, like in any urban environment, there is a lack of places where children will play. The new concept that the pedestrians are more important than the cars, brings just that, Miroslav Milenković explains.

Ever since they moved to this beautiful Mediterranean city, they have realized one thing, the air is polluted,

and it is very noisy everywhere! Everything changed with the move to Poblenou – a part of the city that is privileged and has a Superblock, and now they use every moment to go outside, and they only use the car to travel outside the city.

Barcelona is the first city in the world where such a change has begun, and the process of transformation will take many years to see all the options, given that there is always something that can be refined and sorted out.

Valencia – the healthiest city in the world

Full of impressions after the visits organized in Barcelona, we boarded the train, an ecological means of transport. In less than three hours, we arrived in even more beautiful Valencia – European Capital of Smart Tourism 2022.

It is absolutely impossible to remain immune to the beauties of Valencia. In addition to its own coast, historical and cultural sights, it has perhaps one of the most beautiful parks in Spain, which is located in the drained bed of the Turia River. Namely, this city had problems with floods, so they had to relocate the river to solve a

Photos: (top right) Unsplash/Dayso Q; (bottom left) Mónica Ballester; (on the next page) Pixabay

decades-long problem, but in return, the citizens got a unique park about 12 kilometers long, full of greenery, bike paths, playgrounds for children, but also the City of Arts and science, more precisely a complex of museums and public cultural institutions.

According to Miguel Angel Pérez from the Visit Valèncіa Foundation, the city combines technology and design with quality of life and strives to make all sights accessible to visitors.

"The city's slogan is "smart at heart", which means to be sustainable in an economic and ecological way, to respect the environment, local communities, and visitors. You should come to Valencia because this is our year, we have been declared the capital of smart tourism, and all visitors can enjoy good food, sports, culture, and nightlife; there is something for everyone," explains Perez.

As he pointed out, many tourists are attracted by the combination of history and tradition, which is phenomenally blended with the futuristic look of some buildings, so they look as if they were from the 22nd century.

Valencia is one of the oldest cities in Spain, visited by over 2 million people a year. More than 60 per cent of visitors come because of the City of Arts and Sciences, where they can see the Opera, the interactive Museum of Science, and the largest aquarium in Europe.

We had the opportunity to see the city on bicycles, which was not difficult, given that Valencia boasts 160-kilometer-long bike paths. We, who enjoy riding these two-wheelers, are able to tour the city in a short time and see it from a different perspective. After one such ride around the city, you know exactly where to drink coffee, what to visit or where go shopping.

The inhabitants of Valencia are especially proud of the fact that their city bears the title of the healthiest city in the world, but that should not surprise us, considering that they were the first to measure the carbon footprint of tourist activities with the desire to become carbon neutral by 2030.

Good transport infrastructure and excellent connections with other cities are key to reducing the footprint, which is something we as a country should pay more attention to.

Except for the arrival and the return by plane, our journey through Spain took place in the most environmentally friendly way – mostly on foot, by bicycle, by train, and in some places by organized bus transportation.

Can you imagine something similar in Serbia? It seems that we have finally moved in the right direction because, in addition to the recently introduced high-speed railway Belgrade – Niš, which is communicated by "Soko", local governments are also working to improve sustainable mobility, with Niš, Novi Sad, Kragujevac and Bor standing out. It remains to be hoped that decision-makers and individuals will persevere on this path and be more receptive to sustainable projects in the future.

Prepared by: Nevena Đukić

THE LEADING INTERNATIONAL GAS EVENT IN SE EUROPE

The 37th International Scientific and Expert Meeting of Gas Professionals, along with an international exhibition of gas equipment and technology, was successfully held in the Congress Center of the Grand Hotel Adriatic in Opatija on 11–13 May 2022 and organised jointly by the Croatian Gas Centre Ltd and the Croatian Gas Association (CGA) as a member of the International Gas Union (IGU).

Over the three days in Opatija, more than 500 attendees from 21 European countries, including the USA, met. The event was attended by gas and energy professionals, managers from leading European energy companies, scientists from renowned Croatian and European universities, representatives from the natural gas transmission industry, gas suppliers, producers and distributors, including representatives from large industrial gas consumers, manufacturers and representatives of gas equipment from Croatia and abroad. In all, 44 scientific and expert papers, 11 technical-commercial presentations and 4 interesting panel discussions were organised. More than 190 various gas and energy companies and organisations were represented, with 37 exhibitors presenting their products and services in the exhibition area. In collaboration with the liquefied natural gas terminal operator – the company LNG Croatia LLC, the organisers scheduled a visit to the LNG terminal in Omišalj on the island of Krk for interested attendees.

The event was organised under the high patronage of the Croatian Ministry of Economy and Sustainable Development and the Croatian Ministry of Maritime Affairs, Transport and Infrastructure. The gas event was also supported by the following sponsors: INA – Industrija nafte d.d., Plinacro d.o.o., Siemens Energy d.o.o., Plinacro d.o.o., LNG Croatia LLC, Prvo plinarsko društvo d.o.o., HEP d.d., Monter-strojarske montaže d.d., the Central European Gas Hub (CEGH), Gaztransport & Technigaz (GTT), Monting d.o.o. and Međimurje-plin d.o.o., while the co-organisers were Podzemno skladište plin Ltd. and Termoplin d.d. Varaždin

At the opening of the event, the President of the Croatian Gas Association (CGA), Assist Prof Dalibor Pudić, PhD pointed out that since the last gathering in Opatija, there had been many changes in the European and global energy market, such as enormous price increases, uncertainty concerning security and reliability of supply, as a reflexive action to the Ukrainian crisis. He noted that the CGA supports the path towards decarbonisation of natural gas, which will, in combination with other gases producing fewer emissions, have a very important role in the transition period and that hydrogen will be an increasingly important topic in the future.

Ivo Milatić, the state secretary of the Ministry of Economy and Sustainable Development, highlighted the Croatian Government's policy of providing maximum support for all investments in developing the gas infrastructure and considers the decision to construct the LNG terminal as wise, because the current complex situation offers security that is only possible in a small number of countries in the EU. He also announced that capacities at the LNG terminal on the island of Krk will increase to 6.1 billion cubic metres, and gas production from proprietary sources will increase to 800 million cubic metres next year. Emphasis was also placed on Croatia's endeavours aimed at applying for the Connecting Europe Facility (CEF) (Instrument for connecting for the purpose of constructing the Ionian-Adriatic Pipeline (IAP) on the section from Dugopolje through Montenegro to Albania. At the end of the presentation, the state secretary estimated that in terms of protecting households against gas prices, Croatia is among the leading European countries doing so and also noted that gas reductions for citizens over the coming winter will not happen.

Andrea Stegher, vice president and the elected future president of the International Gas Union (IGU), pointed out that the commenced decarbonisation of energy until 2050 offers gas a chance to have an important role in the energy transition. Particular significance will be given to environmental protection and seeking new solutions for

energy sources that emit the least possible greenhouse gas emissions. In referring to the current energy crisis and securing gas supplies to European countries for the coming heating season, he noted the importance of filling the capacities of gas storage facilities. Regarding LNG, there is currently no supply problem in Europe which is mainly attributed to issues associated with the pandemic currently affecting the largest Chinese cities and reduced demand. He also drew attention to possible difficulties in LNG supplies from the USA because export growth also causes price increases on the American market, where gas continues to be cheaper than in Europe, hence the possibility of restricted exports.

Prepared by: Milica Marković

The 38th International Scientific and Expert Meeting of Gas Professionals will be held in May 2023 in Opatija

Photographs: Croatian Gas Centre Ltd

FAVORITE ROBOT TEACHERS HELGA AND LO

We can often hear that in the future, a lot of work will be done by robots. It sounds almost unreal that one very complex machine can do what we do in everyday life. And while many can only fantasize about this, students from an elementary school in Ivanjica are lucky because, during their classes, they have the help of two unique and specific robots, Helga and Lo.

These robots were created thanks to the sharp mind and great motivation of Milkica Kostić Zlatić, teacher of Informatics and Computing and Engineering and Technology, and they are the first in the region.

Robot Helga gave her first lesson to sixth graders in Engineering and Technology. Dressed in a gorgeous dress, with sparkling eyes, and wearing earrings and a necklace, she said "I am robot Helga, and I come from the future."

It works thanks to artificial intelligence with the help of the interface and it is controlled remotely via a tablet, computer, or mobile phone.

"At the beginning of the coronavirus pandemic, I decided to make an automated technological innovation, robot Helga, to make teaching more interesting. I am extremely proud of this project, especially because the students who love robotics participated in it, and this was an incredible experience for them. A lot of work and effort has been invested in making Helga. It was not easy for us, the sensors were very expensive, and we did everything ourselves. The robot is completely handmade," explains Milkica Kostić Zlatić.

Robot Helga is trained to be an assistant teacher in the teaching process. She moves her head, feels the touch, is interactive in communication, and talks using synthesized speech. According to our interlocutor, Helga has been programmed and reprogrammed many times, and further training is also planned.

The diligent hands and wise heads of teacher Milkica and her students also made the robot Lo, following the example of Helga. Lo uses synthesized speech, as well, he can speak in different languages, moves his hands at the elbow joint, moves his head, sings, talks to people and gives answers to questions.

"I have significant support for the popularization of science and robotics from the Institute for Artificial Intelligence (AI) and the leading researcher, Professor Branislav Kisačanin PhD. Children love robotics and digital technologies in general because they know that something is being created in those classes. I enjoy working with talented and gifted children, and there is nothing I find difficult when they show their creativity," Milkica told us.

MILKICA KOSTIĆ ZLATIĆ also works as a mentor at the Regional Center for Talents in Čačak for the subjects Engineering and Technology and Informatics and Computing. She has been actively researching and educating students in the field of Robotics-Artificial Intelligence for 14 years.

Helga and Lo were presented at the recently held International Innovation Competition "Inova" in Zagreb and returned to our country with a gold medal.

At "Inova" we showed our intelligence and knowledge. Two hundred ninety-three innovations were registered for this competition, and the competition was ranked in primary, secondary schools, and faculties. The jury, who evaluated the students' works with great enthusiasm, met our robots, Helga and Lo. Thanks to artificial intelligence and artificial senses, we were awarded a gold medal," our interlocutor proudly points out. After "Inova", Helga and Lo participated in "Haktin" and the 64th International Fair of Technology and Technical Achievements.

"I want to share my knowledge and gain new ones, and to visit one of the laboratories or institutes for artificial intelligence abroad, for example, in China, Japan, Germany, and Austria. And I would very much like to cooperate with the Institutes for Artificial Intelligence in Serbia and pass on all my knowledge in the field of Robotics-Artificial Intelligence to our talented children," Milkica Kostić Zlatić said.

Prepared by: Milica Radičević

Robot Helga is trained to be an assistant teacher in the teaching process. She moves her head, feels the touch, is interactive in communication, talks using synthesized speech

Photographs: Milkica Kostić Zlatić

SAVE THE PLANET WITH BIOMASS – RENEWABLE ENERGY SOURCE

Global energy consumption has been growing at a galloping rate for years. The use and consumption of fossil fuels in energy production are taking their toll, and we are all aware of climate change and its related impacts. For change to take place, it is necessary to start using renewable energy sources, protect the environment and become energy independent

Biomass represents a renewable energy source that, unfortunately, is the least promoted; hence, its potential is huge. We talked with Nataša Rubežić, President of the National Biomass Association "SERBIO", about the energy transition from fossil fuels to biomass, its importance, and future use, as well as the impact on the environment.

EP ***How to use biomass for energy production? Could we harm the environment, and if yes, to what extent?***

Nataša Rubežić In order to mitigate climate change and achieve energy security, while working on regional development and job creation, almost everyone is turning to renewable energy sources.

When it comes to biomass, which is produced in a sustainable way, the amount of carbon dioxide relevant to the climate is zero – in kilograms. Carbon dioxide released by biomass combustion has previously been absorbed from the atmosphere into plants through photosynthesis and is returned to the atmosphere either by natural degradation or fuel production. Thus, biomass produced sustainably way has no carbon footprint.

After all, a successful climate policy means reducing carbon dioxide emissions. It means that by increasing the use of renewable energy sources we reduce the use of fossil fuels and achieve better efficiency and lower energy consumption.

> The amount of CO_2 released by biomass combustion is already absorbed from the atmosphere into plants through photosynthesis and is returned to the atmosphere either by natural degradation or by fuel production

EP ***What is the importance of using biomass?***

Nataša Rubežić When biomass is used for energy production, it offers different advantages and possibilities to a region or a country. The benefits of using bioenergy are many. Let's start with the creation of new jobs since the activation and functioning of bioenergy chains create more jobs for each petajoule produced than any other form of renewable energy. It is followed by the reversal of the economy at the local and regional levels. Bioenergy allows consumers to spend money on energy in the region instead of paying it to a foreign country, which consequentially means that biomass strengthens the circular economy at the regional level. Of course, the reduction of CO_2 emissions must not be forgotten – sustainable biomass production keeps carbon at a neutral level during combustion.

NATAŠA RUBEŽIĆ is a law graduate from the University of Novi Sad. She gained experience through the institutional judicial system of the Republic of Serbia. Since 2012, he has been the Secretary for Energy and Mineral Resources in the Provincial Government of Vojvodina, followed by the managerial function of the VIP Fund and the Development Agency of Vojvodina – Agency for Support of Foreign and Domestic Investments, as well as the President of the National Biomass Association "SERBIO". In 2021 she earned the Project Cycle Management and Green Project Management certificates, awarded by the International Project Management Organization – IPMA Serbia.

Bioenergy is pretty much affordable – if biomass is used in the heating sector on a regional level, it could get even more affordable than alternative sources for heating. Therefore, the transition to bio-thermal energy can reduce heating bills and have a positive social impact. Additionally, the risk of supply disruption is lower than in the case of fuel imported from other countries or continents. Dominantly, biomass can be supplied from within the region. The most important thing is that it is renewable. An energy system based on renewable energy sources such as biomass can last indefinitely. However, biomass production needs to be sustainable. Therefore, close cooperation with the research community and the development of effective laws and regulations is required to avoid negative impacts on the fertility of the country, forestry, and the environment due to greater use of biomass.

EP ***What is the importance of using biomass in heating plants in Serbia? How many heating plants are in this system, and what are the plans for the future?***

Nataša Rubežić According to the energy balance report for 2020, heating plants in Serbia will dominantly use natural gas (80 per cent), then fuel oil (11.7 per cent), and coal (7.8 per cent), and less than one per cent of the biomass.

The heating plants in Priboj and Mali Zvornik have implemented a heat system production from wood biomass. Both towns participated in the "Promotion of Renewable Energy Sources – Development of the Biomass Market in Serbia" project with a total investment value of 26.75 million euros. This project was implemented by the Ministry of Mining and Energy, the German KfW Bank, and the Swiss State Secretariat for Economic Affairs (SECO). Apart from

Photographs: (previous page) Pixabay/Vargazs; (Rubežić) courtesy of Nataša Rubežić

Biomass could be straw, corn, soybeans in various forms – pellets, briquettes, bales, wood and wood residues, firewood, biomass from fast-growing forests, wood materials left over from demolition, manure, municipal organic waste, organic waste from farms and the food industry

The international investment conference, organized by the SERBIO Association and EBRD partners, is set for October 12th and 13th. Leading energy experts from the entire region will take part in it. The agenda of the conference will cover the current situation, energy transition, problems, and potential solutions. Austria is a partner country of this year's event, but companies from Germany and Austria will also present their technologies and experiences. Look up all additional information on the association website – www.serbio.rs.

Priboj and Mali Zvornik, Prijepolje, Nova Varoš, Novi Pazar and Majdanpek will also introduce biomass heating under this project. The total nominal capacity of these six heating plants is 30 MW.

EP *How complicated is the energy transition from fossil fuels to renewables?*

Nataša Rubežić Energy transition or the change of heating system from fossil to renewable energy sources requires an extensive period of time, huge investments, and various activities, including general measures and specific activities aimed at different consumers.

Regarding general activities, they are related to informing the public and raising awareness of the benefits of supplying thermal energy from renewable sources. Informative brochures are to be prepared to outline the benefits of renewable heating, such as domestic sourcing, creating many jobs in the region, reducing heating costs, avoiding carbon dioxide emissions, which are linked to the growing problem of climate change. There is also security of supply and information on technical options that need to be provided.

We know from experience that the servicemen installing the heating system, and plumbers have a

Photographs: (top left) Pixabay; (middle right) Unsplash/Alexander Schimmeck; (bottom) Pixabay/Recyclind

significant influence when it comes to choosing the system. It is very important to get their support in promoting heating systems on renewable sources and train them to install biomass heating systems and thus ensure a reliable heat supply.

Also, it is necessary to have a national program for testing the quality of boilers in terms of emissions, efficiency, and functionality. The boilers must meet required regulations relating to efficient and clean combustion with low particulate emissions, high efficiency, and reliability.

We must also pay attention to programs to ensure a secure biomass supply from agriculture and forestry. It is necessary to cooperate within the energy sector closely, the forestry and agriculture administrations, and farmers and owners of forests to ensure a reliable and cost-effective biomass supply.

The establishment of public advisory units that will support and assist farmers and small entrepreneurs in preparing projects, usually in the range of 100 and 300 kW in size, is critical.

Energy transition or the change of heating system from fossil to renewable energy sources requires an extensive period of time, huge investments, and various activities

Photograph: (bottom) Pixabay/Michal Křenovský

EP ***How much does the energy transition from fossil fuels to renewables cost?***

Nataša Rubežić The transition to a new heating system based on biomass is expensive in terms of the required investments, even though the price of raw materials is lower than fossil fuels. The investment could be a burden to change the system. Therefore, it is recommended to introduce a program that will offer grants to the consumers who intend to install biomass heating systems. This program should be offered to all consumer groups - individual households, multi-units residential houses, public buildings, and agricultural holdings.

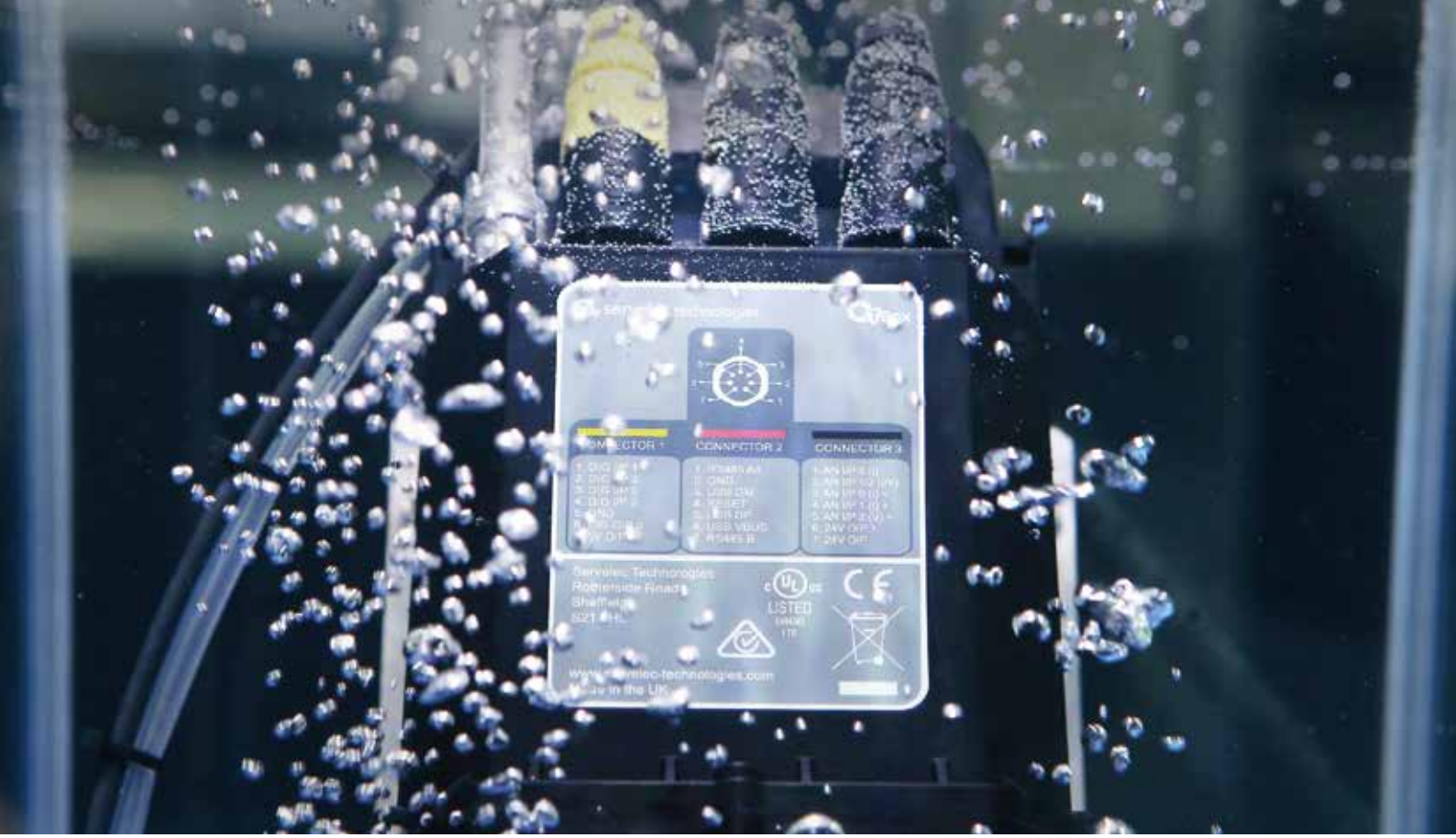
The support program should follow certain rules to be successful and have to be adequately designed and last for several years. It needs to be stable, and it should remain unchanged over a period of years. In accordance with the available financial resources, the amount of support should cover 50 per cent of the investment. The list of pre-conditions for obtaining the support of the Government will be determined through the requirements related to the operation of the plant, i.e., its efficiency.

EP ***What is the importance of creating a sustainable and uninterrupted supply chain as an indispensable element of the energy transition through using biomass for heat production?***

Nataša Rubežić For all plants in which biomass is converted into final energy, it is necessary to ensure a reliable biomass supply – this applies to small biomass boilers, industrial biomass users, and biogas plants, as well as heating plants. Biomass can be of different origins. It can include straw, corn, and soybeans in various forms: briquettes, bales, corn cobs, wood, wood residues, firewood, wood chips or pellets, biomass from fast-growing forests, wood materials left over from demolition, manure, municipal organic waste, organic waste from agricultural holdings and the food industry.

Without a biomass consumer, there is no market for it. Initially, the operator of a larger biomass plant must ensure the supply of raw materials, and then the first plants can turn into a biomass market center. Such a market should offer firewood, wood chips, wood and agro-pellets, and straw bales making it easier for consumers to buy the biomass they need. Large biomass plants such as district heating plants must pay special attention to reliable and cost-effective biomass supply.

Interview by: Milica Radičević



ECO WAVE

THE CONCERN FOR THE ECOLOGY KNOWS NO BOARDERS

ECO WAVE will take place from 20 to 22 September 2022 at the Ljubljana Exhibition and Convention Center in Ljubljana, Slovenia.

We are aware that the Earth, its water, air and land, are common to us all; therefore, the concern for them must be shared by all the people. We will only achieve it by constantly raising society's awareness and educating companies and organizations, grown-up individuals, students, high-school students and children, who are our future!

No matter what we are dealing with, all by-products of our activities lead to the contamination of the core resources of our planet - water, air, and soil. Due to the daily increasing pollution, they should not be taken for granted. The increasing pollution should no longer be treated only as an issue of industrialization and economic growth, but we should have a proactive approach to preventing it.

Sustainable development, circular economy, waste-free society, smart cities, clean water care, waste management, recycling, renewable energy, clean air, etc. are the segments covered by ECO WAVE - a B2B trade fair for environmental technologies.

The event is designed into seven modules:

- Water and sewage
- Waste management and recycling
- Clean air
- Renewable energy
- Soil decontamination
- Environmental technologies
- Clean environment
- Analyses and laboratory techniques, ICT

As concern for ecology knows no boundaries, the voice of ECO WAVE is meant to spread across borders, linking Slovenia with Croatia, Bosnia and Herzegovina, Serbia, Bulgaria, Austria, Italy, German etc.

We kindly invite you to take part in ECO WAVE and showcase your products, equipment and innovative technologies; offer solutions based on high environmental protection and sustainability standards and actively participate in the ECO WAVE Forum!

Should you have any questions, contact the project manager Mr. Toni Laznik at +386 41 668 222, via email: ecowave@icm.si or visit our website www.icm.si.

Photographs: ECO WAVE

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REDUCTION OF AIR POLLUTION WITH JOINED FORCES

Since July 2021, the RES Foundation has been implementing the project "Improving the support to households to reduce air pollution", which is being carried out with the financial support of the Balkan Trust for Democracy, the German Marshall Fund, and the Embassy of the Kingdom of Norway in Belgrade.

During the previous months, in cooperation with the Standing Conference of Towns and Municipalities (SCTM), the cities of Niš, Kraljevo, Novi Pazar, and Užice, as well as the municipalities of Priboj and Kosjerić, have worked on analysis and information and exchanged experiences related

"Environmental protection is one of the Government priorities and is recognized as an activity that will be engaged in the coming period, and therefore the Ministry expects the results from the local level to reflect on the entire Republic of Serbia", said Sandra Dokić

to the program and measures taken to combat air pollution from individual sources as per the public call announced by the Ministry of Environmental Protection in 2021.

A review of previous results and experiences, and a presentation of the Guide with recommendations for more efficient implementation of programs for co-financing measures to reduce air pollution from individual sources, were organized during the final session of the project conference named "Improving the support to households in Serbia to reduce air pollution". In addition to the representatives of the mentioned cities and municipalities which directly

implemented measures to reduce air pollution during 2021, the conference was also attended by representatives of local self-governments competing in the recently announced public tender of the Ministry of Environmental Protection to co-finance projects related to projects on the reduction of air pollution from individual sources for 2022.

Assistant Minister of Environmental Protection Sandra Dokić emphasized the importance of dialogue between the Ministry of Environmental Protection and representatives of local governments.

"Environmental protection is one of the Government priorities and is recognized as an activity that will be engaged in the coming period, and therefore the Ministry expects the results from the local level to reflect on the entire Republic of Serbia", Sandra Dokić said, pointing the importance of information flow related to good practices for the Ministry, since the results and goals are even bigger at the strategic level.

Dokić stated that one of the most important goals of the Ministry is to facilitate the simplification of the competition process and that she and her colleagues from the Ministry are fully aware that, in the end, the final execution of the project is on the local self-government units.

The conference was attended by managers from the energy sector, heads of organizational units for environmental protection, representatives of the Offices for Local Economic Development from all six local governments that implemented measures to reduce air pollution during 2021, as well as from 10 municipalities and cities, who will for the first time, work on implementing these measures in 2022.

The message from the RES Foundation was: "About three million households in the Western Balkans are heated by burning firewood, often of poor quality or wet wood in inefficient furnaces, which cause excessive air pollution and insufficient heating. Abandoning the inefficient types

of heating is one of the main measures that would positively affect the air quality, which we closely monitor on various applications and websites during the winter period."

This was a great opportunity to exchange experiences and information about the process, potential measures to reduce air pollution from individual sources, criteria, and procedures for selecting grant beneficiaries. All data and information will be used to prepare the Guide, which will include recommendations for other local self-government units to more efficiently implement measures to reduce air pollution from individual sources in future public calls.

Prepared by: Milica Marković

Photographs: RES Foundation

YOUTHSPEAK FORUM HELD THROUGHOUT SERBIA

During April and May this year, the sixth YouthSpeak Forum was held, a global project organized by the young for the young. Thanks to the student organization AIESEC, which is the holder of the project, conferences were held in Belgrade, Novi Sad, Kragujevac, Niš and Subotica, cities where there are local offices of this organization.

AIESEC brings together young people worldwide and enables them to develop their leadership potential through volunteer and professional experience abroad and involvement in various projects it organizes.

In addition to getting to know each other, the participants, divided into teams, solved a case study every day, after which the winning teams received numerous prizes. Great speakers such as artists Andrej Josifovski, Marko Luis and Dragan Vojvodić, marketing experts Lazar Džamić, then Branko Babić, Ena Luna and many others contributed to the whole atmosphere. The young people also had the opportunity to get acquainted with many companies whose employees helped them solve case studies and supported the conference. These are Nelt, Elixir Group, Erste Bank, Aptiv, Johnson Electric, Paladio East.

Under the slogan "it concerns you", the project encouraged young people to think about what they will do after finishing school, in what conditions they will start their career, what their environment will look like, whether there will be enough natural resources and what their life will look like.

You can follow the plans for the next events within this conference on their Instagram page @youthspeakserbia, and if you want to get acquainted with all the possibilities provided by AIESEC, visit www.aiesec.org.rs.

The conference was attended by more than 600 delegates who had the opportunity to get acquainted with the diverse content, while the guest of the conference was the UNICEF organization

Photographs: YouthSpeak Forum

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