ISSN 2560-6034

ENERGY PORTAL MAGAZINE

NR. 17 ■ 2019

JEAN-LOUIS FALCONI
Ambassador of France

The Key to Sustainable Development is Political Will

VIKTOR NEDOVIC
Assistant Minister of Education and Science

Innovation is the Future of Serbia

ZORAN RADOJICIC
The Mayor of Belgrade

Aiming for Healthier and Greener Belgrade

ABB'S SUCCESS FORMULA

Part of the ProCredit Group

ProCredit Bank

Since **2007.** we are providing **green loans** for energy efficiency improvements.

More than **110** million euros was disbursed for loans for **energy efficiency and renewable energy** to small and medium-sized enterprises and agricultural producers in Serbia

The **first** bank in Serbia with **electric cars** in its fleet.

The only bank in Serbia that has received **a certificate ISO 14001** for the environmental protection.

Using energy wisely

IT'S WORTH IT.

+381 700 700 000
local call rates apply

+381 11 20 57 000
service provider rates apply

www.procreditbank.rs

ENERGETSKI PORTAL
energetskiportal.rs

Quarterly edition

Address:
103/3 Boulevard Oslobodjenja
11010 Belgrade

e-mail of the editorial board:
info@energetskiportal.rs

Publisher:
CEEFOR Ltd, Belgrade

Print:
Grafostil, Kragujevac

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

620.9

ENERGY portal magazine / editor-in-chief Nevena Djukić. - [Štampano izd.]. - 2017, no. 9- . - Belgrade : CEEFOR, 2017- (Kragujevac : Grafostil). - 30 cm
Tromesečno. - Preuzima numeraciju onlajn izdanja Energetski portal Srbije, gde je objavljeno 8 tematskih brojeva. - Drugo izdanje na drugom medijumu: Energy portal magazine (Online.) = ISSN 2560-6034. - Ima izdanje na drugom jeziku: Magazin Energetskog portala (Štampano izd.) = ISSN 2560-5232

ISSN 2560-6026 = Energy portal magazine (Štampano izd.)

COBISS.SR-ID 259518988

Dear readers,

Although number 17 is on the cover, this is a small anniversary of our Magazine, given that it is the 10th issue since we redesigned our bulletin into Magazine and started printing it. With each new issue, we have grown and changed, so now in addition to the permanent columns, we have two new ones – Opinion and Confrontation in which distinguished experts present their views on very delicate topics. There is much debate about the presence of genetically modified food, which is banned in Serbia; thus, we kindly asked university professors Miladin Sevarlic and Vladimir Dimitrijevic to give us their judgement on an invention which was created as a solution to the problem of world hunger.

French Ambassador to Serbia Jean-Louis Falconi gladly shared with us the green experience of his country. In the building sector, France has set an ambitious renovation plan for old buildings, with a € 14bn fund dedicated to energy renovation. Ambassador Falconi revealed to us that at the beginning of 2019, the French government had established the mechanism enabling households to replace heating boilers for just € 1. We are giving you just a little detail from the interview you can read through in this issue.

A public call for grants for the development of innovative products, services and technologies has been published recently, thus with the professor Viktor Nedovic, PhD, Assistant Minister of Education, Science and Technological Development we discussed, among other things, the strategically important scientific projects financed by the state to preserve the environment.

With the Mayor of our capital, Professor Zoran Radojicic PhD, we talked about the problems of the city and what he is doing for Belgrade to become the Green Capital. The Mayor has recently launched a challenge Tree for Belgrade, with the idea of planting as many trees as possible to fulfil the goal of having 25 per cent of urban area covered with a green surface by 2025.

New tool for the fight against air pollution, AlgiOx is a smart, self-sustaining air generator which uses the power of microalgae for the production of oxygen and removal of harmful particles and gases from the air, and the young creators of this invention have explained to us how it works.

In this issue, we have two inspirational stories from the region. The first one is about the best Croatian diver, Goran Colak, a man who pushes boundaries both in diving and in raising awareness on the need for personal responsibility in waste management. The other story is about a company from Bosnia and Herzegovina, named Enova, that has developed a tool for smart urban planning. Their software allows dynamic calculation of airflow and dispersion of pollutants in space and time in real orography.

Since this issue came out just before winter holidays, you will have enough of free time to devote yourself to other compelling stories from the Magazine. We wish you happy holidays, and we hope that in the next year we will do more to preserve nature than we have managed so far!

Nevena Djukic,
Editor in Chief

6 JEAN-LOUIS FALCONI

The Ambassador of France to Serbia

The Key to Sustainable Development is Political Will

As the world talks about France, the French government and French citizens have come a long way in their common goal of tackling climate change as effectively as possible in the spirit of social justice. It is, therefore, no surprise that France, after Denmark, Sweden and Finland, is the fourth country in the world to achieve the Sustainable Development Goals successfully. French Ambassador to Serbia Jean-Louis Falconi gladly shared with us his country's green experiences, as well as several democratic lessons that show us the importance of massively involving citizens in all levels of decision-making about their country's climate destiny.

16 VIKTOR NEDOVIC

The Assistant Minister in Charge of International Cooperation and EU Integration at the Ministry of Education, Science and Technological Development

Our Science has an Excellent Rating in the World

Even tough that the appropriations for science are not at the level of the European average, in 2017 Serbia ranked 51st out of 230 countriesbased on the global survey ranking conducted by SCImago Journal & Country Rank. In terms of scientific production among Eastern European countries, Serbia ranks 8th out of 23 countries, says Viktor Nedovic, stating the Ministry has taken significant steps towards a comprehensive reform of the scientific and research system.

IN THIS ISSUE »»

Photographs: (Falconi) courtesy of Jean-Louis Falconi; (Nedovic) courtesy of Viktor Nedovic

Photographs: (Radojicic) courtesy of Zoran Radojicic; (Kostic) courtesy of Ivana Kostic

THE KEY TO SUSTAINABLE DEVELOPMENT IS POLITICAL WILL

As one of the global leaders in the fight against climate change and the environment, France is an example to many of how, despite crises, one can persist in clearly defined goals of conserving resources and improving the quality of life. We spoke with French Ambassador to Serbia Jean-Louis Falconi about the main levers of French climate policy implemented by the government and how important democracy and science are altogether

Photograph: Unsplash/Alban Martel

The eyes of the entire world are on France when it comes to combating climate change, not only because of the 2015 Paris Agreement, which pledged this country to reduce greenhouse gas emissions to zero by 2050. Not a day goes by without some environmental news from France getting around the world, whether it is about new government measures or laws in the implementation of climate policy, the strong reaction of citizens to them, or, in turn, green inventions and new advances in clean technology. However, as the world talks about France, the French government and French citizens have come a long way in their common goal of tackling climate change as effectively as possible in the spirit of social justice. It is, therefore, no surprise that France, after Denmark, Sweden and Finland, is the fourth country in the world to achieve the Sustainable Development Goals and even second in the world in the implementation of environmental protection measures. It is, therefore, no surprise that France, after Denmark, Sweden and Finland, is the fourth country in the world to achieve the Sustainable Development Goals successfully, and even second in the world in the implementation of environmental measures. French Ambassador to Serbia Jean-Louis Falconi gladly shared with us his country's green experiences, as well as several democratic lessons that show us the importance of massively involving citizens in all levels of decision-making about their country's climate.

Jean-Louis Falconi, Ambassador of France

After graduating from the College of Economic and Trade Studies and then the Institute for Political Studies, Jean-Louis Falconi worked for almost twenty years in various positions at the Ministry of Foreign Affairs. He spent four years in Brussels as Permanent Representative of France to the Political and Security Committee of the European Union, and three years in Vienna as Permanent Representative to the United Nations Office and at international organisations. Since 2019, Falconi has been the ambassador of France to the Republic of Serbia. He is a Knight of the National Order of Merit. He speaks English and German.

EP ***France is in the top 5 most sustainable countries in the world, and it is ranked #2 in EPI2018. When did this ecological revolution start, and how did France become one of the global leaders in environmental protection?***

Jean-Louis Falconi In France, the awareness of the harmfulness of overexploitation of natural resources is not new. In the 1990s, the UN's international summits and the agreements that emerged from them – Rio and Kyoto - have also contributed much to the national awareness on this subject. At the environmental conference on sustainable development in 2012, the French government decided to establish a roadmap on the issue, with five round tables, on the energy transition, biodiversity, health risks, ecological taxation and environmental governance. Then, in 2013, a national public debate on the energy transition was launched. The French government's guidelines were drawn from its conclusions. Today, France's climate commitments are structured around the Energy Transition for Green Growth Act, passed in August 2015, and the Energy and Climate Law promulgated in November 2019. With these two texts, France intends to meet its obligations made during the COP21, chaired by France in Paris in November 2015, and accelerate the transition towards a Greenhouse Gas Neutral society in 2050. In this context, the most emblematic commitments of my country are to end the sale of cars using fossil fuels until 2040 and to prohibit any new hydrocarbon exploitation license on the French territory to put an end to their extraction by 2040.

EP ***What are the major factors that most affect France's high level of sustainable development – renewable energy resources, biofuels, government support for clean technology or something else?***

Jean-Louis Falconi The key to success is above all, the political will to set ambitious commitments and to stick to them. This will is noticeable in all sectors of the economy. Concerning energy, the 2019 Climate Energy Act provides, for example, for the shutdown of the last coal power plants by 2022. On the other hand, we rely on innovative resources and investment funds to develop new technologies and ensure their functioning. The second factor is, of course, French know-how in research and development. All large companies comprise units working on innovation in their respective fields, anticipating our needs and the challen-

ges of tomorrow. France also has a proactive policy aimed at start-ups specialised in the environmental field, either in terms of taxation, subsidies or the creation of working conditions conducive to their development.

EP ***France's most significant environmental challenges are climate change, air pollution and waste. What is the national strategy to cope with these problems?***

Jean-Louis Falconi The energy and climate law, adopted in July 2019, has particularly raised the target of reducing fossil fuel consumption to 40 per cent by 2030 compared to 1990 (and compared to 30 per cent per today). The budget for 2020 also provides for the introduction of an eco-contribution for all flights departing from France, which will go directly to financing transport infrastructure, notably the rail infrastructure. With regard to waste, a Circular Economy Roadmap was published in April 2018, aiming at reducing waste and make recycling procedures more efficient. It requires action at all levels – by introducing measures in favour of eco-design of products, the integration of recycled materials into the industrial production, a more responsible consumption, by extending the life of the things we own and others. Finally, measures are being implemented to optimise the sorting of waste and develop recycling. An anti-waste bill is currently being considered in the Parliament.

EP ***Although the French government has committed to a net-zero emissions for 2050, some reports show that the reduction of carbon dioxide emission is not fast enough. In the first place, it hasn't been done enough in the field of traffic modernisation and renovation of old buildings. What efforts are you making to reach this goal?***

At the beginning of 2019, the government set up a mechanism allowing households to **replace their boilers for only € 1**

Photographs: (top right) Unsplash/John Towner; (below) Unsplash/Dorian Mongel

Jean-Louis Falconi Although France is currently in the process of exceeding the joint objective adopted with the European Union for 2020 under the Climate Convention, we are not on the path we set for ourselves in 2015. We have emitted 65 million tons of CO2 more than expected. All this despite the reduction of our emissions by more than 4 per cent in 2018 compared to 2017, and by 18.8 per cent compared to the level of 1990. The newly created High Council for Climate highlights the lack of progress made in the transport and building sectors: the transfer to modes of transport alternative to cars and road transport is insufficient, new vehicles on the market are not as effective as expected, while the renovation of buildings, although more numerous, remains insufficient. With regard to transport, the Mobility Orientation Law, adopted in November 2019, encompasses the goal of complete decarbonisation of land transport by 2050. To achieve this, it targets the development of low CO2 emissions vehicles for 2030, and the end for the sail of new light fossil-fueled vehicles by 2040. For these initiatives to fit all pockets, the law puts in place measures to facilitate carpooling, the use of bicycles with adapted roadways, or the provision of charging stations for electric vehicles. In the building sector, France has set an ambitious renovation plan

for old buildings, with a € 14bn fund dedicated to energy renovation. At the beginning of 2019, the government set up a mechanism allowing households to replace their boilers for only € 1. Of course, none of this can be done without incentives such as reinforcement of environmental taxation, reimbursements for conversion to a low carbon, bonuses for purchasing low-carbon cars, penalties for polluting vehicles, flexible taxes for company vehicles.

EP ***Last year, yellow vests protested against a new carbon tax that was supposed to increase carbon dioxide levies, but the fee was waived. To what extent do these democratic pressures make it more difficult, or sometimes easier, to implement a set climate policy?***

Jean-Louis Falconi Although the protest movement was triggered by the rise in the carbon tax (which has been frozen at the 2018 level), protesters' claims were broader than carbon taxation, and focused more on social justice, renewal of democracy, territorial divides and purchasing power. The President of the French Republic announced in December 2018, his intention to organise a Grand National Debate to allow all of us to discuss issues which are essential for the French people. It was held in the first quarter of 2019 and structured around four themes: the ecological transition, taxation and public spending, democracy and citizenship, the organisation of the state and public services. An online platform has collected nearly 2 million online contributions, and more than 10,000 local meetings have been organised. The President of the Republic announced, during his press conference in April 2019, his proposals in response to the conclusions of the Great National Debate. On the climate aspects, this included the organisation of a citizens' conference of 150 randomly selected citizens with a mandate to define a series of measures aiming to achieve our climate objectives in a spirit of social justice. This democratic experiment, unprecedented in France, started at the beginning of October and will provide a list of measures by the end of January 2020.

EP ***In France, a law has been in force since 2017, requiring all new buildings to have green roofs or solar panels. What are the reactions to this law?***

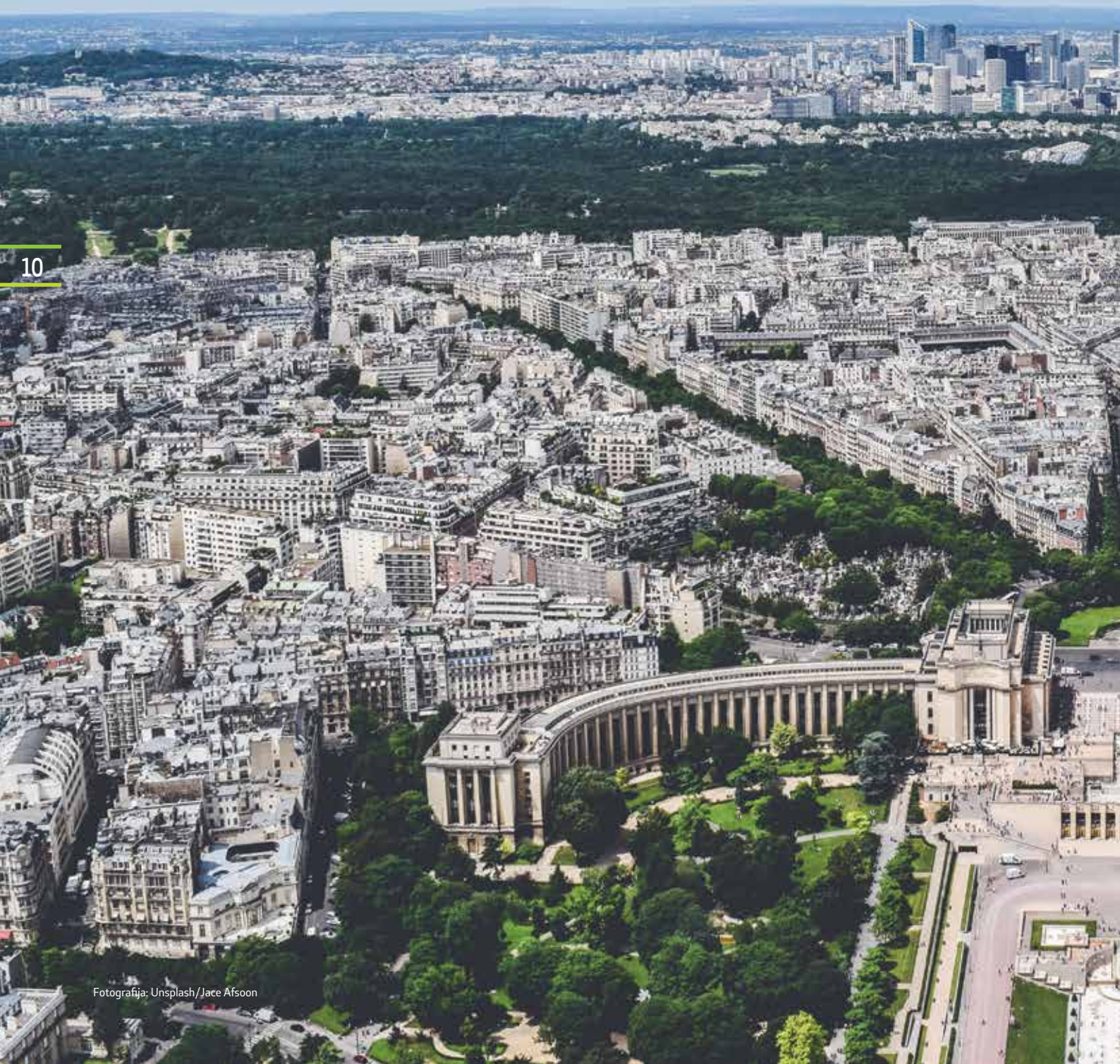
Jean-Louis Falconi Many French cities rely on this legislation to support new urban and architectural concepts.

Photographs: (middle left) Unsplash/Agence Producteurs Locaux Damien Kuhn; (bottom right) Unsplash/Giuseppe Mondì

A few days ago, for example, the Olympic Village of Paris was presented to the media, with measures aimed at carbon neutrality, including plant walls, urban agriculture, a large share of wood in the construction of buildings etc. The reaction of people is quite positive, especially those who live in cities. All these cities envisage citizen participation both in defining the budget and in developing many ideas about sustainable urbanism that come from civic bodies.

EP ***French company Vinci has built the world's first fully recycled road, 1 km long, using the material from old roads. Three years ago, in Normandy, a kilometre of the road was built from solar panels to illuminate the streets in the village. What about some other green inventions in your country?***

Jean-Louis Falconi There are plenty. The French government promotes numerous research and development activities in the field of renewable energies, including financial support and calls for projects, via the green GreenTech initiative. The Ministry of Ecological and Solidary Transition organised various competitions enabling the emergence of a community of start-ups, scientists and entrepreneurs, among the 120 project promoters selected so far. One of them, BeeBrite, is active in the field of energy-saving and consumption. Through intelligent use of data and artificial intelligence, it enables commercial and industrial spaces, factories and electric vehicle charging stations to reduce their carbon footprint by consuming less electricity. The algorithms take into account the meteorological conditions, various periods of activity in given areas, the use of devices, to achieve the result of opti-



Fotografija: Unsplash/Jace Afsoon

mal use of the resources - up to 40 per cent less electricity consumption. The winners of the Sustainable Mobility Call were announced in mid-November 2019. One of them, Mobili'COB, is developing a set of solutions for the development of carpooling by multiple citizens travelling the same route in a very sparsely populated area in central Brittany.

EP ***During French President Emmanuel Macron's visit to Serbia in July, France and Serbia signed several contracts and agreements on cooperation concerning environmental quality improvement. What, in particular, do these agreements mean for both countries?***

Jean-Louis Falconi Serbia faces many challenges today on its way to progressively achieve European standards. The necessary investments in water treatment, waste, energy efficiency, renewable energy are considerable, and French companies are naturally present in these markets. In some cases, the French government supports these projects by financing preparatory studies and by developing cooperation between Serbian and French proponents. The recent survey conducted by *Electricité de Strasbourg* related to the development of profound geothermal energy in several localities of Vojvodina is a perfect example. Applications are numerous in industry, agriculture or distant heating systems.

Besides, the French Development Agency (AFD) that has recently been set up in Belgrade will assist Serbia in this transition thanks to a wide range of financing tools. The agency's mandate is clear, most funded projects should contribute to the fight against climate change.

Interview by: Gordana Knezevic

THE ADRIATIC--IONIAN PORTS THROUGH PROJECTS TO IMPROVED ENERGY EFFICIENCY

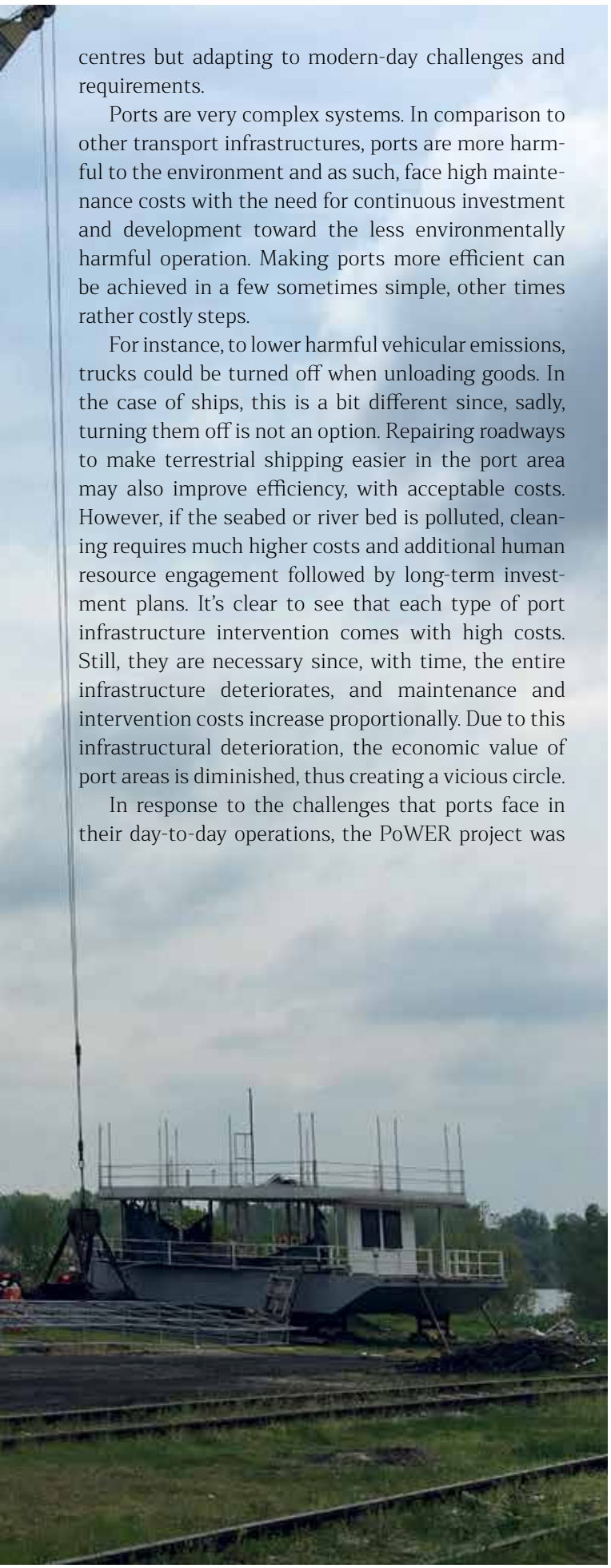
After World War II, ports in the mentioned region along with the river ports along the Danube have lost their past roles as dynamic marketplaces and cultural centres. Also, the new challenges presented by improvements in communication and technology have left ports outdated and without the chance to perform at their full potential. In Serbia, through which the Danube flows 558 kilometres, there are excellent conditions for water transport, a way of transporting goods which has been neglected. However, the fact that European foundations have invested funds in revitalizing revitalize these harbours is encouraging, and there are also targeted EU programs, along with international Adriatic-Ionian regional initiatives, like the "Ports as Driving Wheels of Entrepreneurial Realm - PoWER".

PoWER is an initiative which has its complete methodology based on the idea which was submitted by the European Parliamentary Research Service (EPRS), which was first adapted for use in the maritime sectors and port areas. The project aims to re-evaluate the condition and situation of the Adriatic-Ionian ports and restore the historical roles that these places once held as development and exchange

All photographs: The PoWER project team

NEXT STEPS

After months of work, the institutions taking part in the PoWER project are completing state assessments as well as developing a PoWER strategy. The final event will be held in Bari, in December, during which stakeholders in the "innovation supply chain" will be invited to sign a Memorandum of Understanding to implement the strategy stemming from the project. Before Bari, a series of meetings were held in Sarajevo, Rijeka and Igoumenitsa, and the last event took place in Novi Sad in early November.



centres but adapting to modern-day challenges and requirements.

Ports are very complex systems. In comparison to other transport infrastructures, ports are more harmful to the environment and as such, face high maintenance costs with the need for continuous investment and development toward the less environmentally harmful operation. Making ports more efficient can be achieved in a few sometimes simple, other times rather costly steps.

For instance, to lower harmful vehicular emissions, trucks could be turned off when unloading goods. In the case of ships, this is a bit different since, sadly, turning them off is not an option. Repairing roadways to make terrestrial shipping easier in the port area may also improve efficiency, with acceptable costs. However, if the seabed or river bed is polluted, cleaning requires much higher costs and additional human resource engagement followed by long-term investment plans. It's clear to see that each type of port infrastructure intervention comes with high costs. Still, they are necessary since, with time, the entire infrastructure deteriorates, and maintenance and intervention costs increase proportionally. Due to this infrastructural deterioration, the economic value of port areas is diminished, thus creating a vicious circle.

In response to the challenges that ports face in their day-to-day operations, the PoWER project was

created to test and develop a methodology for driving innovation in port areas in response to currently identified needs. The project supports the development of ports and changing them into Innovation Hubs, or other centres where innovation is cultivated. This process brings together many stakeholders who are involved in the ports' "supply chain", and as such, requires enhanced cooperation on both local and international level to achieve both vertical and horizontal objectives of the proposed innovations. The project is currently being implemented in 6 pilot ports (Bari, Brcko, Drac, Igoumenitsa, Ravenna and Rijeka) with the main objective to improve their energy efficiency.

The results of the project will be visible upon completion when the activities and strategies proposed by the local decision-makers during the project are expected to be implemented. The backbone of the project finding a solution to the problem of insufficient energy efficiency that most ports of the Adriatic-Ionian region are facing and the ultimate goal of the initiative is to offer a methodology for solving this burning problem.

The PoWER project was supported as a part of the First Call for Proposals of the ADRION Interreg V-B Transnational Program, funded by the European Regional Development Fund and the Instrument for Pre-Accession Assistance, the so-called IPA II.

Prepared by: The PoWER project team from the "European Affairs Fund" APV

More information can be found at www.powerports.eu

INNOVATION IS THE FUTURE OF SERBIA

Serbian science has an excellent rating in the world, and one of our greatest potentials is a growing innovation ecosystem and high-quality engineering staff. Recently announced public call for grants for the development of innovative products, services and technology is exactly the way to harness this potential, says Viktor Nedovic PhD, Assistant Minister, Ministry for Education, Science and Technology

VIKTOR NEDOVIC PhD
In addition to his duties at the Ministry, he is also a full professor at the Faculty of Agriculture in Belgrade. He is the founder and president of the Serbian Association of Food Technologists (SAFT), a member of many professional and scientific organisations, as well as the author and co-author of more than 400 scientific and professional papers.

What are the strategically important scientific projects supported and financed by the state with the view to preserve the environment, how are the scientific community and the economy connected, how are our scientists ranked in the world and how much do we share our experience in this field with others, are we in line with EU laws and standards when it comes to the development of science and technology and what EU funds do we use for these purposes, we spoke with Prof. Viktor Nedovic PhD, Assistant Minister in charge of International Cooperation and EU Integration at the Ministry of Education, Science and Technological Development.

EP ***To what extent is the Ministry of Education, Science and Technological Development strategically committed to developing indigenous scientific potential towards improving living conditions and environmental protection?***

Viktor Nedovic The Ministry finances numerous research projects through four different programs. For example, through integrated and interdisciplinary research program, in Serbia are implemented projects such as the research of agrobiodiversity and land m muse, monitoring and assessment of long-term exposure to environmental pollutants, development of a global system for continuous research and integrated ecosystem management, bioremediation and soil degradation research, research in climate change and their impact on the environment... The things that are being developed are methods, sensors, and systems for monitoring water, air and soil quality, technologies for monitoring and protecting the environment from harmful chemical substances and radiation load, as well as research into the effects of ionizing and UV radiation in the field of medicine and environmental protection and monitoring of electromagnetic radiation of mobile telecommunication systems in the environment. Through the technological development program, projects are being implemented to study the impact of mining waste on water pollution, develop new bioecological materials for soil and water protection, improve sediment remediation technology for water protection, develop bio-sorbents for natural and wastewater treatment, develop methodologies and tools to protect the noise of urban areas, develop hydro information systems for monitoring and early warning of droughts, as well as projects for the reduction of air pollution from thermal power plants and systems for the removal of harmful components of smoke and the development of technologies for building non-pollution thermal and other power plants.

EP ***The Ministry, through the Innovation Fund, implements programs that finance the development of innovation, with***

Photographs: (background) Unsplash/Ramon Salinero; (Viktor Nedovic) courtesy of Viktor Nedovic

a particular focus on start-ups or mature companies. What is your experience with environmental innovation so far?

Viktor Nedovic The Fund also encourages the cooperation of private companies and research organisations to jointly, with concerted efforts develop new, innovative products, services or technologies. As far as environmental projects are concerned, several projects have been supported so far. For example, one of them has developed a software application that offers an efficient system of environmental impact assessment or the development of a graphene acoustic camera for use on drones to record noise sources. Another example is a company that has developed a mushroom growing technology that is based on industrial-scale waste utilisation and energy minimisation. The fund also provided financial assistance through the Strawberry Energy Early Development Program, a start-up that is considered one of the pioneers in the field of renewable energy.

EP ***Recently, your ministry announced a call for co-financing joint projects of the scientific and research community and economy. What it is about?***

Viktor Nedovic On 10 October, the Innovation Fund launched a public call for grants for the development of innovative products, services and technologies through the Early Development Program and the Science and Economy Cooperation Program. Applications for both programs are submitted through the Innovation Fund's portal by December 31, 2019. Within (the framework of) the Early Development Program, the Fund may allocate up to € 80,000 per project and micro and small businesses established in Serbia, with majority private domestic ownership and no older than five years, may apply for the program. For the first time since this call for proposals, teams can submit an application, which will be required to register a company only if their project is approved for funding. Funding allocated by the Fund covers up to a maximum of 70 per cent of the total eligible costs of the project, whose duration is up to 12 months. The Science and Business Cooperation Program grants financial support of up to € 300,000 per project, and the beneficiaries are consortia made up of at least one private micro, small or medium-sized enterprise established in Serbia and one publicly accredited research organization. The support enables consortia to undertake joint projects to create high value products, services, technologies and technological processes through applied R&D. The means awarded by the Fund cover a maximum of 70 per cent of the total eligible project costs for micro and small enterprises, or 60 per cent for medium-sized enterprises. Projects can take up to 24 months. For this public call funds were provided in the amount of six million euros within the budget of the Republic of Serbia, from the division of the Ministry of Education, Science and Technological Development.

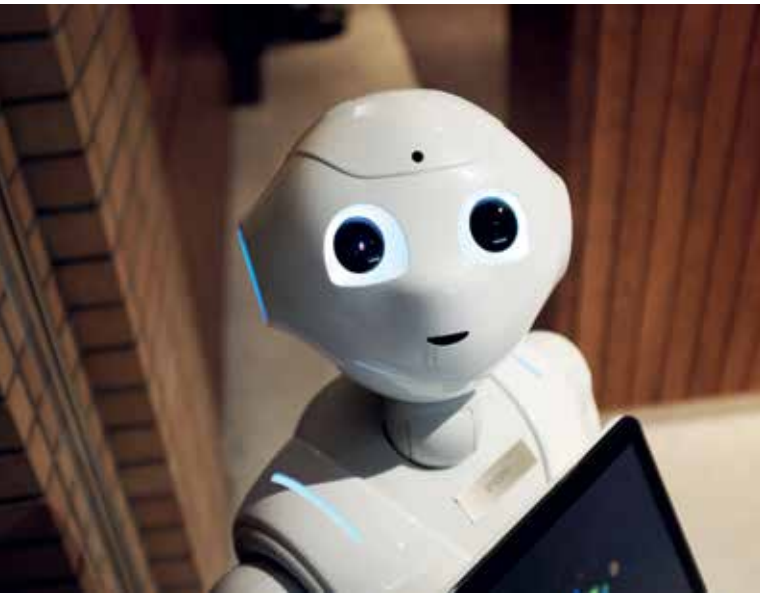
EP ***Where is our place in the world of science?***

Viktor Nedovic Our science has an excellent rating in the world, despite the fact that the appropriations for science are not at the level of the European average. Based on the global survey ranking conducted by SCImago Journal & Country Rank, in 2017, Serbia ranked 51st out of 230 countries. In terms of scientific production among Eastern European countries, Serbia ranks 8th out of 23 countries. The Ministry has taken significant steps towards a comprehensive reform of the scientific and research system. Two very significant laws were passed in the past, Law on Science and Research (in July 2019) and Law on the Science Fund (in December 2018). Passing these laws is a key step in reforming the system for organisation and funding of science, which will create conditions for continuous development of scientific research and development activities in Serbia. This reform is accompanied by increased investment, as evidenced by the fact that funds were increased by 35.8 per cent from 2015 to 2019, and the continuous provision of support from IPA and other sources resumes. In addition to reforming the science funding system, the Ministry has done a great deal to rejuvenate the Serbian scientific com-

	Index	2012/13	2013/14	2015/16	2017/18
1	Global Competence Readiness Index – Serbia	95	101 out of 148	94 out of 140	78 od 137
2	Quality of educational system	111	111	110	93
3	Quality of education in maths and science	60	55	48	29
4	The capacity of the country to retain talents – "brain drain"	125	146	140	134
5	The capacity of the country to attract talents	141	147	139	132
6	The availability of the latest technologies	123	115	110	87
7	Intellectual property protection	116	115	129	116
8	Innovation capacity	120	133	132	117
9	Number of patent applications per million inhabitants	119	53	53	50
10	Quality of scientific and research institutions	67	66	67	47
11	University-industry collaboration	99	104	95	95
12	Availability of scientists and engineers	78	85	82	68

Photo: Courtesy of Viktor Nedovic

munity through the involvement of more than 1,100 young researchers in ongoing Ministry projects. Also, in terms of innovation, Serbia certainly shares experiences with other countries. According to the latest Startup Genome report, Serbia is one of the growing innovation ecosystems in the field of information technology development, whose key advantage is high quality engineering staff. The Global Innovation Index (GII) measures the state and success of innovation in 126 countries. In the 2018 GII report, Serbia ranks 55th, an increase from 2017 when we were ranked 62nd. Of the 7 areas covered by the index, Serbia is best rated in terms of infrastructure (48th out of 126 countries) – primarily related to the development of information and communication technologies and environmental sustainability. On the other hand, the market of secondary sources of financing for fast-growing companies are at a very early stage of development and it is necessary to work on creating incentives for investors and venture capital funds, as well as to create a universal culture by disseminating knowledge through education and transfer of experience.



EP ***To what extent are we in line with EU standards when it comes to the development of science and technology? What are some EU funds that we can use to develop these areas?***

Viktor Nedovic According to the EC report for 2019 on the state of the reform process of Chapter 25, the Republic of Serbia is at a good level of preparedness in the field of science and research. Participation in the Union programs is crucial for Serbia. As part of the research space, we have been offered numerous opportunities within Horizon 2020, Erazmus+ and other programs. In Horizon 2020, according to the data from July this year, we have 393 participations in 274 projects, and we have contracted approximately € 91.4 million. In addition to the Mary Curie scholarships, the largest number of projects is in the field of food, energy and information technology. In addition, EU pre-accession IPA funds are available to us. By using these funds, we can, at the national level, enhance the capacity of the scientific community and the innovation ecosystem. In order to receive funding from the European Structural Funds, Member States and regions need to have an adopted Research Innovation Strategies for Smart Specialisation that would define decisions on development direction in this area. The process of developing the

Smart Specialisation Strategy in Serbia started in early 2017. The Ministry of Education, Science and Technology coordinates the process which includes all relevant institutions. The state already greatly assists the cooperation of economy and science through various programs, and by implementing the Smart Specialisation Strategy, a mechanism will be made where investments will have greater effects. The priority areas identified in this process are food for the future, information and telecommunications technologies, creative industries, machines and processes of the future. In the horizontal part, there are environmental protection, energy efficiency, digitalisation and some of the key technologies.

EP ***You are a full professor at the Faculty of Agriculture and for several years you have organised the Ecotrophelia of Serbia, a national competition in creating eco-innovative food solutions. What are our youngest scientists apt to?***

Viktor Nedovic The aim of the competition is to encourage student innovation, an eco-friendly approach, an entrepreneurial spirit, to encourage them and support them in creating their own companies. Student teams have a task to create brand-new food products and realise it from idea to final product. It is a real pleasure to see that enthusiasm of students, that energy, a lot of great ideas and the desire to embark on something new, to prove themselves, to start their own business. The competition is organised by the Serbian Association of Food Technologists. A significant partner is Science Technology Park Belgrade, which offered its services to students from the beginning for free, then USAID, UNDP and the company Design who all provided support for the national competition.

Interview by: Gordana Knezevic

Photos: (left) Unsplash/Alex Knight; (right) Unsplash/Christian Wiediger

THE GROWTH OF EV CHARGING NETWORK

According to the data coming from public and private companies, the number of delivered and installed chargers for electric vehicles is on the rise in Serbia. If this upward trend in the field of electric mobility continues, our country will be making gradual progress as to match other European countries which have come a long way in the expansion of EV chargers' network and the number of electric vehicles on the roads.

Among renowned charger producers, and their solutions which digitally contain connecting and monitoring of EV chargers network, the Schneider Electric company stands out. This company creates interconnected technologies and solutions for energy and process management in a safe, reliable, efficient and sustainable manner, and the solutions in electromobility are precisely the field where Schneider Electric has a lot to offer.

In Serbia, this company has been working since 1997. As a part of their extensive portfolio of products and services, the chargers are an important segment of electromobility development at our market. We asked Dragan Buaca, the sales manager for commercial and industrial facilities at the Schneider Electric Srbija company, about the number of EVlink chargers installed at parking lots and streets throughout Europe and Serbia.

Dragan Buaca,
Sales Director for Commercial and Industrial Facilities at Schneider Electric Serbia

EP ***Can you draw a parallel between the share at the market in France, and in Europe generally, and the one you have in the Balkans and Serbia?***

Photographs: (Dragan Buaca) courtesy of Dragan Buaca; (all others) Energy portal/Zana Sisic

Dragan Buaca France is one of the most developed European countries in this field. The fact that organizations in France, such as Postal service, taxi and courier companies, public transport and other utility companies which owes vehicle fleet, recognized the advantages of electric cars. Studies show that transition to electric vehicles provides an opportunity for operational costs and maintenance reduction for up to 50 per cent.

Encouraged by this, owners of electric cars installed chargers for their use in private garages, whereas the city administration units put chargers at public space and commercial parking lots. The whole systems for electric car rental were established in the bigger cities. Today in Europe there are 100,000 EV charging stations. As much as 73 per cent of that sum is concentrated in four EU countries alone: Netherland, Germany, France and Great Britain.

When it comes to the global electric car sale, the record-breaking year was 2016, and it has been projected that by 2025 every sixth car sold in the world will be those electrically powered. According to estimates, this will propel the number of EV chargers in Europe to reach 2 million by that time. As for Serbia and Montenegro, around 100 of EV chargers were hitherto installed.

EP ***Talking about chargers exploitation, could we implement some European experiences to the increase of the chargers network in Serbia?***

Dragan Buaca The expansion of electric cars sale in Europe entails the need for chargers installation. Norway serves as the best example of how strong that need is. In that country, electrically powered cars took a share of 30 per cent of all vehicles sold in 2018. There is a plan in Norway to completely phase out the sale of vehicles with an internal combustion engine by 2025 so that air pollution and CO_2 emissions could be reduced as much as possible.

As for our country, that time is certainly coming. Encompassing innovative solution developed by Schneider Electric for optimization and chargers' network management is called EcoStruxure, and it is one of the solving that we may expect to be applied soon in our region.

EP ***How much did local companies embrace the potential in electromobility development?***

Dragan Buaca For the past couple of years, it is evident that an increasing number of companies have demonstrated an interest in charger installation. Public sector companies as much as privately owned enterprises install chargers to an expanding extent at their parking lots and garages.

EP ***What companies specify as the principal motive for e-mobility implementation in their business?***

Dragan Buaca By and large, the motives are ecological awareness and need for environmental protection. On the other hand, investors want their clients who drive electric cars to enjoy fully in the comfort and amenity of recharging their vehicles while spending time at the investor's facility.

EP ***How to raise awareness on using new technologies, including electromobility, which is also one of the means for the GCG emission reduction?***

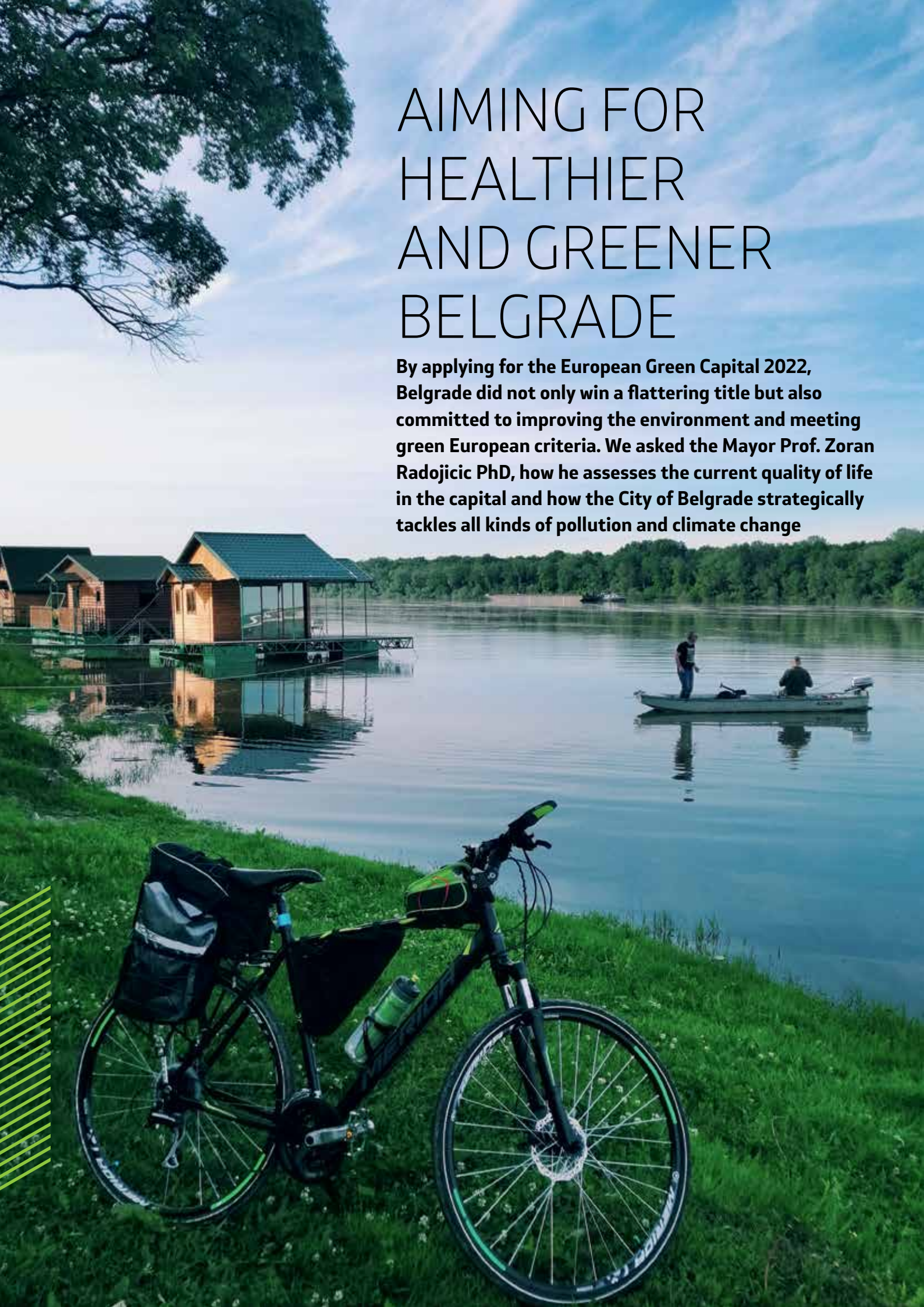
Dragan Buaca Our team is in contact with the clients on a daily basis. We are trying as much as we can to advocate a need for electric car use through seminars, conferences, presentation etc. Also, publishing texts like this one in specialized magazines and portals is a powerful way to raise awareness on the necessity of environmental protection, thus on the use of electric vehicles. Undoubtedly, the need for optimized electricity consumption and challenges of producing green energy, which is attained by installing solar panels in combination with chargers, are some of the crucial reasons for investors to adopt an ecologically responsible attitude.

EP ***Apart from three chargers already installed, within the following phase, it was planned to install more chargers at the ZF company's parking lot in Pancevo. How satisfied are you with cooperation and how do you expect this to impact other companies?***

Dragan Buaca In the second half of 2019, the ZF factory was extended and built up, and six new chargers were delivered and installed at the company's parking lots. We are ever so satisfied and proud of this cooperation, both with the investor and the MT-KOMEX company, which is our service partner for EV charger integration. A particularly interesting solution is a canopy, built above the parking places, with solar panels for supplying EV chargers so that energy used for charging electric vehicles at his parking lot is 100 per cent green.

Sure enough, the ZF company as one of the global leaders in the field of solutions for the mobility of the future serves as a great example to other companies when it comes to raising environmental awareness and promotion of the need for electric car use and chargers installation in Serbia.

Interview by: Tamara Zjacic



AIMING FOR HEALTHIER AND GREENER BELGRADE

By applying for the European Green Capital 2022, Belgrade did not only win a flattering title but also committed to improving the environment and meeting green European criteria. We asked the Mayor Prof. Zoran Radojicic PhD, how he assesses the current quality of life in the capital and how the City of Belgrade strategically tackles all kinds of pollution and climate change

PROF. ZORAN RADOJICIC PhD, is a pediatric surgeon, urologist and professor at the Faculty of Medicine in Belgrade, who has perfected his profession abroad, at the most prestigeous children's clinics and hospitals. Prior to becoming the Mayor of Belgrade in 2018, he served for five years as Director of the University Children's Clinic in Tirsova, as well as coordinator of the Ministry of Health for Pediatrics and Pediatric Surgery. As a Mayor, he believes that Belgrade is the city of the future and that the citizens of Belgrade are the most important.

If all the citizens of Belgrade, as their Mayor, walked every day, used public transport more, and planted some trees when the opportunity arises, perhaps our capital would already be a bit cleaner and the air healthier. Of course, to give up the comfort of private cars, it is necessary to have more buses on the streets, to have the subway built as soon as possible and to have such traffic infrastructure that we can safely and massively use bicycles as a means of transport. Naturally, we do not want to be worried about how polluted the air we breathe during the heating season is, that we want to drink quality water always, have our rivers clean and our city packed with parks and greenery. We spoke to the Mayor, Prof Zoran Radojicic PhD, about how far we are from such an image of Belgrade and what the City does to become a green capital. The Mayor has recently launched the challenge Tree for Belgrade with the idea of planting as many trees as possible in the capital so that by 2025 we can meet the goal of having 25 per cent of the urban part of the capital green.

EP ***Belgrade has recently ranked as one of the cities with the most polluted air in the world, and an increase in concentration of toxic particles is yet expected in the heating season. There is an application on the City's website where Belgrade citizens can monitor the air quality and receive recommendations in the event of pollution, but what has the City done so far regarding short-term and long-term measures to fundamentally tackle this problem?***

Zoran Radojicic The City of Belgrade has been implementing an Air Quality Plan that includes measures and actions to reduce the largest sources of pollution. Since 2016, when this Plan came into force, the City has invested more than 300 million dinars, and within this plan, the most significant measures taken were the reduction of the number of individual combustion chambers, the improvement of the performance in thermal power plants and the expansion of the district heating network. We are implementing a program for shutting down boiler rooms in public buildings by connecting them to the district heating system and the natural gas distribution system. The district heating system in Belgrade includes 65 per cent of primary and almost 85 per cent of secondary schools, as well as about 75 per cent of kindergartens. Since 2012, 17 boiler rooms have been shut down in primary and pre-school institutions, and those facilities have been connected to the district heating system. The plan is to continue shutting down boiler rooms in public buildings. For the time being, our priorities are schools, and

Photographs: (on the previous page) Jelena Kostic; (Zoran Radojicic) courtesy by Zoran Radojicic; (bottom) Pixabay

later health care institutions and other public facilities. As a part of this Plan, to improve air quality, we have expanded pedestrian zones and raised public awareness of the importance of being informed about air quality through the application you mentioned - BEOEKO.

By purchasing 244 new buses by the end of the year, GSP will have 85 per cent of the fleet with EURO 5 and EURO 6 standard engines. Likewise, in the next year, funds are allocated for the purchase of another 100 articulated buses, 40 trolleybuses and 10 electric buses. With these moves, the structure of the bus subsystem will be significantly improved in terms of the exhaust emission itself, which will have a positive effect on air quality. The Forestry Strategy of the City of Belgrade should not be forgotten either, which is a direct implementation of measures aimed at reducing air pollution, but also adapting to climate change and protecting soil from erosion. All of these measures will improve air quality in Belgrade, but we all know that this is a key project to tackle the issue of exhaust emissions originating from traffic and traffic jams.

EP ***What measures can be taken to reduce the number of private vehicles in the wider centre and to enable Belgrade citizens to use public transport more?***

Zoran Radojicic Next year we will start building the metro, which will be a revolutionary change in the way urban transport operates. According to our estimates, more people, between 25 and 30 per cent, will replace cars with the subway, which will reduce the number of cars downtown and allow people to travel more efficiently. I believe that by modernizing the fleet, which I mentioned, we will be able to get citizens to use as much urban transport as possible, especially for shorter distances. Changes towards a greener capital cannot happen overnight, and the city's urban plans and strategies have defined more walking and cycle paths in recent years, especially in the city centre area, which you can see when walking downtown.

EP ***How to motivate the citizens of Belgrade to use a bike as a means of transport more? Bicycle tracks whose number in the city has increased are not stimulating enough.***

Zoran Radojicic As of February 2020, the Sustainable Urban Mobility Plan enters into force, and such a plan boasts all modern metropolises. The idea is that every road has a bike lane to create a real network. It is necessary for cyclists to be safe on the streets, and to make this possible, it is necessary to develop a functional cycle network. From 2017 to 2019, another 35 km of cycle paths were completed, which means that there are currently 100 km of paths in Belgrade. However, these tracks are mostly along rivers and are used for recreational purposes, which is highly complementary, but the culture of using a bicycle as a means of transport has not yet taken root. It is with the new Sustainable Urban Mobility Plan that we want to change that, and I am sure that the citizens of Belgrade will follow our idea and goal. Over the next four years, another 120 km of cycle tracks are planned, and the public bicycle system will encourage us to think more about the bike as a means of transportation.

EP ***On the streets of Belgrade, there is an increasing number of electric scooters, which are banned in some metropolitan areas because they are too risky for safety, although they are a convenient environmental mode of transport. How does the City of Belgrade intend to regulate this type of transportation?***

Zoran Radojicic Electric scooters could be a part of the solution to the traffic problem in Belgrade, but only after the

Photographs: (middle left) Grad Beograd; (top) Pixabay

Photograph: Pixabay

change in existing traffic regulations. Due to their enormous popularity, they are changing the traffic image of major European cities, including Belgrade. It is for this reason that there is a need to regulate them, especially in the field of security. It applies equally to pedestrians as well as to the users of electric scooters. I would point out that this is an ecological mode of transport, in line with our commitment to turning to the green hierarchy of transport which gives priority to pedestrians, cyclists and urban public transport, so that cars are used less.

EP ***Many experts point out that a serious unifying strategy is required to implement adequate environmental measures and solutions in the capital earnestly. You stated last year that the City of Belgrade is working on developing a strategic plan that will deal with climate, energy and Belgrade as a green city. How far has this strategy gone?***

Zoran Radojicic I signed an agreement to join the Covenant of Mayors for climate and energy in 2018 and pledged to reduce the CO2 emissions by up to 40 per cent by 2030. Consequently, the City of Belgrade committed to developing the Green City Action Plan (GCAP) and the Sustainable Energy Development and Climate Change Action Plan (SECAP) within the European Bank for Reconstruction and Development's Green City program. We are currently in the process of drafting these documents, we have put together a working group that together with eminent consultants in this area work on the development of an action plan, so I expect that by the end of 2020 we will adopt such a document. It will also focus on ways, concrete measures and solutions on how to adapt to climate change through reducing carbon dioxide emissions, increasing energy efficiency, using renewable energy sources and creating sustainable mobility in the city.

EP ***How green is Belgrade now? Will we, by 2025, fulfil the plan, which the City has committed to, to have 25 per cent of green space in the urban part of the capital? As the Mayor, recently you launched the challenge Tree for Belgrade and invited organizations and companies to join it.***

Zoran Radojicic Currently 15 per cent of the territory of the City of Belgrade is covered with green space. For this ambitious but achievable goal, we need another 2.5 million seedlings by 2025. As a Mayor, since the beginning of my term, I have been in favour of a healthier and greener Belgrade. I started the challenge called Tree for Belgrade to join as many international organisations as possible, as well as socially responsible companies, in the fight for a healthier and greener Belgrade and planting as many trees as possible in our capital. Will and readiness to participate in this challenge were first shown by the German international organisation GIZ, planting 163 trees in Usce Park. I want to thank GIZ and Director Gerhard Zipel for supporting us to begin the Tree for Belgrade challenge, as well as for making it possible to achieve other sustainable development goals as soon as possible for the benefit of all our fellow citizens. I also invite other international organisations, socially responsible companies to join this challenge and to plant as many trees as possible in Belgrade. The contact email is drvozabeograd@beograd.gov.rs. By planting in Belgrade, we have a positive effect on air quality, climate change, we lower temperatures during the summer, and reduce carbon dioxide emissions, the risk of flooding and landslides, noise levels and the effects of global warming. Trees and nature represent the green infrastructure of every city, which is why it is essential to preserve and restore it. PUC "Zelenilo Beograd" plants around 4,000 trees a year and 70,000 tree seedlings regularly. Planting is an integral part of the renovation and reconstruction of every park in Belgrade. We also maintain and

restore natural resources such as Kosmaj, Avala, War Island and others. Belgrade is also launching the Generation Tree campaign – in 197 elementary schools, and each first grader will plant one tree in their schoolyard.

EP ***The city of Belgrade successfully ran for the Green Capital of Europe in 2022. What is the benefit of joining the network of green cities in Europe?***

Zoran Radojicic The application process itself was not easy. Out the 18 cities whose candidacy was accepted, Belgrade is the only city of the non-EU country. Among the cities, we compete with are Budapest, Lyon, Perugia, Tallinn, Krakow, Zagreb, Sofia and others. This year's Green Capital is Oslo, and for 2020 it is Lisbon. Already next year, within this competition we will have a series of activities dedicated to ecology in our city. In the spring of 2020, we will find out which cities entered the finals of this competition, and in June, who won. It is, of course, important for me to win this prestigious title in the years ahead. However, at this point, it is even more important to us that we have entered the whole process – so that it helps us make Belgrade a healthier and nicer place to live. It is a very ambitious goal, and the candidacy itself is a big step. Applying for the Green Capital involves not only greening the city but improving the quality of the environment. The Green Capital is the guiding principle for many significant projects that mean better life in our capital, and they relate to meeting European criteria in the whole area of environmental protection.

EP ***What are the European standards that we should meet?***

Zoran Radojicic We are the only capital that directly discharges waste into its rivers, and that is why one of the goals is to build wastewater treatment plants, especially in Veliko Selo. Then, in cooperation with the Republic of Serbia, we work on the realization of the construction of primary and secondary sewerage network because, let me remind you, one-third of the city does not have a sewerage network. In the area of waste treatment, one of the key projects is the realization of a public-private partnership for the Vinca landfill. We must continue our waste selection campaign in conjunction with City Cleanliness. And we also decided to ban plastic bags from January 1, 2020.

EP ***Do we have any other green measures, other than banning plastic bags, that we can apply? How do you encourage scientists and young talents to offer as many innovative environmental solutions as possible?***

Zoran Radojicic The City of Belgrade, together with the Government of the Republic of Serbia and the University of Belgrade, founded the Science and Technology Park. This is exactly where scientists and young talents should look for support and a place to develop their innovative ideas.

EP ***The largest natural resources of Belgrade include the Sava and the Danube. However, none of us, in terms of society, treats them responsibly. How would you rate the current state of rivers and water?***

Zoran Radojicic According to the monitoring results of the Secretariat for the Environment and the City Institute for Public Health, the water quality in the Sava and Danube is good, mostly thanks to their large capacity to receive wastewater. In terms of water quality, smaller watercourses, which do not have this capacity, are a bigger problem, so their quality is poor. Wastewater treatment plants are the solution, and the first one to be built is in Veliko Selo. In the coming period, we also expect projects for four wastewater treatment plants to be financed from the National Investment Plan.

EP ***What do you, as an ordinary citizen, do every day to protect the environment?***

Zoran Radojicic I try to walk and use public transport as much as possible. I also urge others to drive cars as little as possible, because that way we are less polluting the air in our city. If each one of us contributes, we will have a healthier environment.

Interview by: Gordana Knezevic

Photograph: Miloš Pakaški

FREEDOM TO MOVE

Presenting the new E-TWOW generation

Some of the advantages of E-TWOW scooters:

- **More powerful engine, 500 and 700 W**
- **Stronger battery, up to 48 V 10,5 Ah**
- **More range, even up to 50 km**
- **Better slope climb ability, in no time**
- **Airless tyres, no breaks**
- **Kers technology, less energy consumption**
- **Two absorbers, better stability**

ETROTINETI

www.e-ride.rs

12 Urosa Martinovica St. (store nr. 6)

etrotineti@gmail.com

+381 (0)69 **010 20 30**

JOIN THE TRANSPORT REVOLUTION!

Already on July 29 of 2019, humanity has consumed all the natural resources that the Earth can restore in one year and thus plunged into annual ecological debt earlier than ever (Earth Overshoot Day). Enslaved by irresponsible consumer habits and wasteful culture, we are getting into debt to the planet, or rather, to our successors. With this in mind, we should mould all segments of our lives according to sustainability, and transport is one of them

Supporters of the greening of the transport sector are trying to spend as little time as possible holding steering wheels. That is why they walk, ride bikes, use public transportation, or ride in electric vehicles. Electric cars, as silently as the engines that drive them run, are conquering the streets of many cities. In order to make getting around by using electricity feasible, the increase in the number of such vehicles should be accompanied by the development of charging infrastructure.

One of the first companies in the Serbian market to respond to the call for a singular electrical revolution, and made a step towards the future was Belgrade-based company MT-KOMEX. On its website elektropunjaci.com, you will find answers to questions such as: "Which electric charger is right for my home?", "How do I choose an electric charger that meets my business requirements?", or "Where in Serbia and region I could charge my car?".

Home and public EV chargers offer

In the store on the elektropunjaci.com website, there are 12 home and 17 public chargers, ideal for installation in parking lots, gas stations, shopping and business centres, highways and corridors, and in private parking.

The available electric chargers for your home range from 3.7 kW to 22 kW, and those for commercial use range from 7 kW to 50 kW. They can be wall-mounted and floor standing.

When it comes to charging speed, their current offerings include medium speed and fast chargers, but the company announced that it would soon expand its store with ultra-fast ones that would be able to charge renowned Tesla cars in 5 to 10 minutes.

The sale is ongoing, so, you can get some EV chargers at a discounted price.

The business portfolio of experts from this website is based on years of experience, during which they have installed more than a hundred chargers. Take the opportunity to "tailor" the charging station according to your needs and capabilities with them!

Before you, they were approached with the same request by Hyundai, Ada Shopping Center, British Motors, ABB, IKEA, ZF, Hilton Hotel, Obilicev venac and Pionirski park public garages and many others.

In the parking lot of the Hyundai auto dealer in Belgrade, ABB's model from elektopunjaci.com was recently put into operation. Installers put the power of the device to the test. The charger successfully passed it after only 15 minutes of work - it took that much time for the car to prepare for the journey with full battery capacity. If this result does not seem fascinating to you, put it in a comparative perspective! What percentage of your mobile phone's battery is charged in a quarter of an hour? Much less than 100 per cent, right?

Considering the fact that as many as 16 ABB chargers, 22 kW each, have been installed in the garage of capital's Ada shopping mall, you are sure that at Radnicka 9 you will have a place to charge your four-wheeler.

At Zrenjanin road, in the British Motors branch, ABB model of 50 kW is expecting the drivers of electric vehicles.

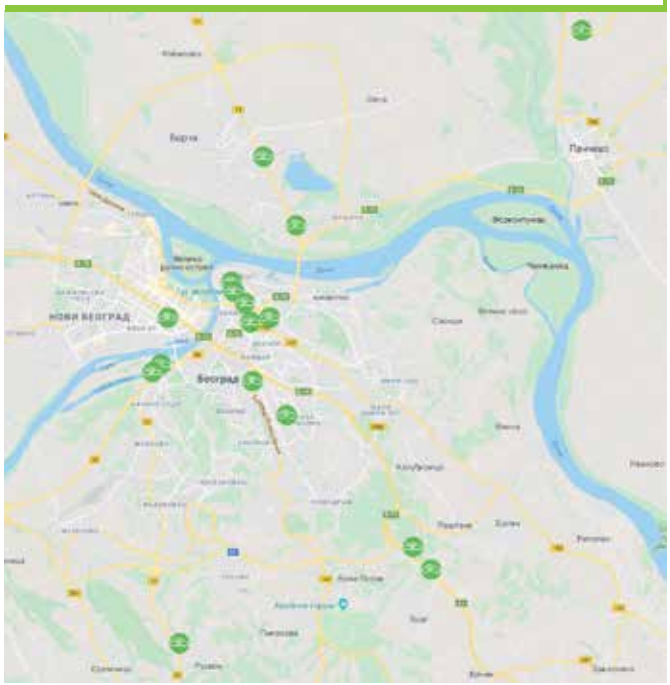
In case that you started travelling in an electric vehicle on the highway E-75 towards central and south Serbia, and potentially further towards Greece, it will do you good that you know that department store IKEA purchased two Schneider Electric chargers at the elektropunjaci.com online store and installed them at its parking.

MT-KOMEX has combined its two fields of activity, renewable energy and electromobility, at the factory of the auto parts manufacturer ZF in Pancevo under the roof of the solar canopy. Seventy-two canopy panels form a small solar power plant with a total power of 19.44 kW. It produces electricity to power three electric chargers, and for ZF's consumption.

Prepared by: Jelena Kozbasic

EV CHARGERS MAP

Although the largest number of electric chargers is concentrated in Belgrade, the map on the elektropunjaci.com website also shows charging points in other parts of our country and the region, so you should visit it even if you are planning an electric car trip in our area, not exclusively buying electric chargers.



elektropunjaci.com

www.elektropunjaci.com

elektropunjaci@mt-komex.co.rs

011 **77 04 566**

Photographs: (left) Energy portal/Zana Sisic, (all others) Energy portal

DO WE KNOW WHAT WE EAT AND HOW SAFE WE ARE?

A careful reading of product label and purchasing food from trusted suppliers are certainly the first level of protection against the intake of not only genetically modified food but of any food of dubious quality. How much we are protected from the ever-increasing GM food on a general level, whether we should avoid it, what the science says and what the laws say, we asked two experts who have a distinctive approach to the topic

Professor
Vladimir Dimitrijevic PhD,
Head of the Department of Animal Husbandry at the Faculty of Veterinary Medicine in Belgrade

Professor
Miladin Sevarlic PhD,
Member of the Parliament and the Professor Emeritus at the Faculty of Agriculture in Belgrade

People all over the world continuously cross swords over genetically modified (hereinafter referred to as GM) food as one of the vital topics. While some advocate that it is the food of the future which could solve the problem of hunger in the world, others define it as bioterrorism of the new world order. Either way, it is becoming more and more accessible and more affordable due to its price. Although the production and supply of genetically modified organisms (hereinafter: GMOs) are prohibited by the Law in Serbia, this is no guarantee that you may not buy a product that has some form or some percentage of GM ingredient. What precisely GM food is, in which foodstuff GMOs are most represented, how to be sure about the things we are buying and eating, how much the law and the science protect us from the harmful effects of GM foods, we asked professor Vladimir Dimitrijevic PhD, the Head of the Department of Animal Husbandry at the Faculty of Veterinary Medicine in Belgrade, and professor Miladin Sevarlic PhD, the Member of the Parliament and the Professor Emeritus at the Faculty of Agriculture in Belgrade.

EP ***What exactly is GM food, and where is it more prevalent in the food of animal or plant origin?***

Vladimir Dimitrijevic GM food is a food of animal or plant origin derived from organisms (animal or plant) into whose hereditary basis (DNA) is inserted a part of the hereditary basis originating from another organism (another species) with a special procedure (Recombinant DNA technology). In this way, we made this organism modified (hence M in GMOs) at the DNA level. The idea behind the modification is to make certain genes in the body "switch on" or "off", depending on the desire with which the modification is done. There are incomparably more organisms modified in this way in the food of plant origin.

Miladin Sevarlic The Law on Genetically Modified Organisms (Law on GMO 2001, 2009) did not contain genetically modified food, nor it defined the term among the terms used in the law. Genetically modified food was defined on 14th March 2019 by Article 2 of the Law on Amendments to the Law on Food Safety, and it says: "Genetically modified food and genetically modified animal feed is the food and animal feed derived from genetically modified organisms in accordance with the specific regulation." This is

Photographs: (Dimitrijevic) courtesy of Vladimir Dimitrijevic; (Sevarlic) courtesy of Miladin Sevarlic; (background) Unsplash/Mae Mu

an incomplete definition since there are no guidelines on the origin of the subgroup of foods. A non-partisan member of the Parliament, I proposed a complete definition, which says: "Genetically modified food and genetically modified animal feed, food obtained from genetically modified organisms and feed obtained from genetically modified organisms, according to a special regulation."

It is very important to point out the difference between the two subgroups of GMO-based agricultural and food products: GM food – which originates from GMO that are used as fresh agricultural products: GM tomatoes, GM apples, GM bananas... and GMO food – food products obtained by processing GMO (GM apple or GM banana chips, GM tomato ketchup, GM salmon fillets, GM pig steaks...) or the food with GMO additives (the food with GM corn syrup toppings...). Explosion of genetic modifications in agriculture – firstly in plant (from tomatoes, through soybeans, corn, cotton, oilseed rape... to apples and banana) and then in animal production (salmon, pigs...) as expected, due to the insatiable profitability of private corporations, with the production of GM medicine for the sick people who make a last-ditch effort, has extended to people; thus we already have the first GM babies in China (2018).

EP ***Is there any food industrial product today, domestic or imported, or raw vegetables, fruit, meat and fish for which we can say with certainty that it does not contain any percentage of a genetically modified organism? Or is everything contaminated to a greater or lesser extent?***

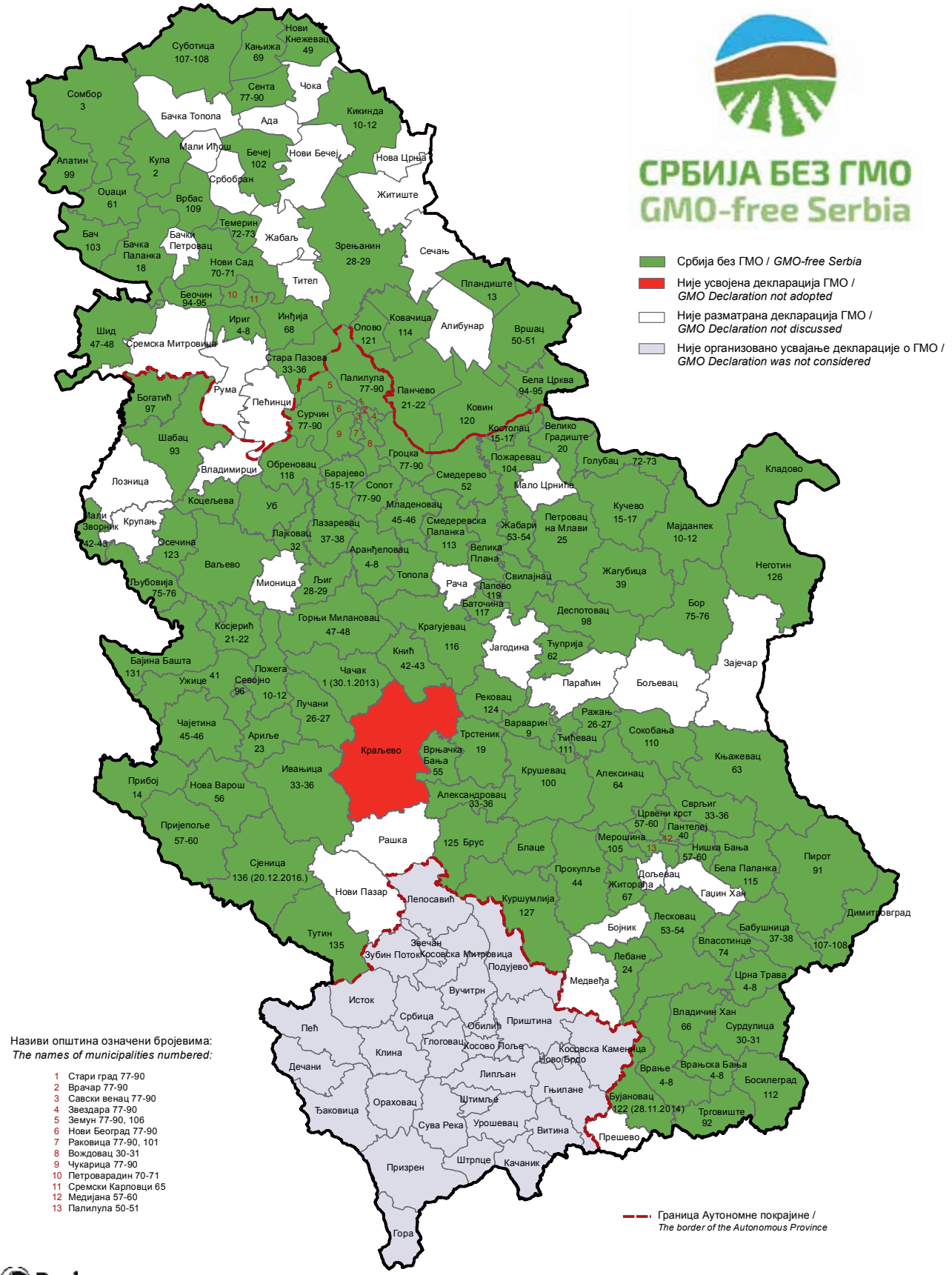
Vladimir Dimitrijevic First of all, the term "contamination" has a negative connotation among people, which is not justified in the case of GMOs.

Of course, there are food products that do not contain GMOs. Depending on the country, the percentage of genetically modified crops varies from 0 to over 90 per cent (corn, soybeans, pumpkins, cotton, etc). In the US, for example, it is estimated that the share of products (food) in supermarkets, which in some extent contains

Општине и градови у Србији према усвајању Декларације о ГМО

Municipalities and cities in Serbia with respect to the adoption of the Declaration on GMO

У периоду од 30. јануара 2013. (1. Чачак) до 20. децембра 2016. (136. Сјеница)/ *In the period from 30 January 2013 (1. Čačak) to 20 December 2016 (136. Sjenica)*



Називи општина означени бројевима:
The names of municipalities numbered:

1 Стари град 77-90
2 Врачар 77-90
3 Савски венац 77-90
4 Звездара 77-90
5 Земун 77-90, 106
6 Нови Београд 77-90
7 Раковица 77-90, 101
8 Вождовац 30-31
9 Чукарица 77-90
10 Петроварадин 70-71
11 Сремски Карловци 65
12 Медијана 57-60
13 Палилула 50-51

Prvi Prvi Na Skali

Извор / *Source*: http://www.prviprvinaskali.com/clanci/gradoviopstine/gradovi-i-opstine-srbije-protiv-gmo.html

Аутор логотипа Србија без ГМО: Никола Илић
Author of the logo of the GMO-free Serbia: Nikola Ilić

Аутори: Проф. др Миладин М. Шеварлић, Весна Ђорђевић, Дејан Милошевић, Татјана Бањеглав
Authors: Prof. Dr. Miladin M. Ševarlić, Vesna Đorđević, Dejan Milošević, Tatjana Banjeglav

genetic modification, is about 65 per cent. On the other hand, there is a relatively small number of countries, including Serbia, which have zero tolerance for the production and supply of GMOs.

Generally, in countries in which GM food is widely available, the largest number of GMO products are related to foods of plant origin (drinks, snacks, food supplements, etc). The proportion of genetically modified food of animal origin is very little. Except for some species of fish (salmon), the market shelves do not contain food originating from animals that have been genetically modified. Animals that ate genetically modified food cannot become genetically modified, and that is a common misconception among people.

Miladin Sevarlic Of course, there is! Fortunately, that is still vastly dominant majority of food produced in the world: from food obtained in certified organic or non-certified biodynamic agriculture, through food which is safer from integrally controlled agricultural production to less safe food from today's dominant conventional production which uses pesticides in plant and growth hormones in livestock production, as well as additives, artificial flavours and colours in food production.

EP ***What have previous researches shown, to what extent is GM food harmful to human health? What are the most common consequences of its long-term consumption?***

Vladimir Dimitrijevic All previous scientific studies that dealt with this issue suggest that the consumption of genetically modified food does not represent greater risk from the consumption of food that is not. Therefore, the consequences of a long-term diet with food that contains GMO in some form do not differ from the long-term intake of food which is GMO-free. Please note that, when discussing this issue which causes sharp divisions in public, only scientific researches published in rigorous peer-reviewed scientific journals, and not pseudoscientific and unscientific publications, should be considered.

Miladin Sevarlic Starting from the research of Arpad Pusztai PhD (England, 1996), through, so far longest, two-year research conducted by professor Gilles-Éric Séralini PhD, (France, 2012), up to the studies of numerous Russian scientists, all the results indicate the harmful consequences of feeding experimental rats with GMOs produced with the use of pesticides based on carcinogenic glyphosate. In that respect, the most significant results are the researches of professor Séralini which show changes in the internal organs of rats in the next generation, from the increased participation of cancer in the second generation to the utter infertility of rats (even at such an extensive species in terms of population) fed by GM corn. If we apply the results to the people, it would mean that the true scale of the harmful effects of using GMOs in livestock and people's nutrition will manifest in 90 to 120 years! The impact of GMOs on the nutrition of all types of cattle should be investigated, and those results would be very significant due to the shorter cycle of exploitation of certain types of livestock. Thus, we would have reliable data on the consequences of GMO in human nutrition in only one-fifth of people's lifespan since people are on the top of the food chain because we use both plant and animal products. What happens to plants and animals will someday strike people too! Let me remind you of the "mad cow disease" and the consequences on the people who ate the meat of diseased cattle. Why haven't the researches on the GMOs impact on livestock been done? It is obvious who finds that rather convenient.

EP ***In Serbia the distribution and production of GMO are officially banned according to the Law on Genetically Modified Organisms from 2009. However, various data indicate that there are thousands of hectares under GM soybeans in Serbia and that despite the law and border checks, we import products that exceed 0.9 per cent of GMO admixture, which is considered in Europe as an inevitable level of technological contamination. How is this Law applied and how can we be sure that we are truly protected as citizens?***

Vladimir Dimitrijevic That would, however, be a question for someone else. Legislation, enforcement and control are the responsibility of the institutions of this country, primarily

Photograph: Petar Slijepcevic

the Expert Council for Biosafety, authorised laboratories, phytosanitary and veterinary inspection.

Miladin Sevarlic The Law on GMOs from 2009 is relatively good protection for Serbia against the import and the placement of GMOs. The only thing that needs to be improved is the adoption of a by-law which stipulates that the provision on the permitted presence of 0.9 per cent of admixtures of GMOs in commercial products applies only to GMOs that are authorised for use in the European Union. The provision on the allowed presence of 0.1 per cent of GMOs admixture in seeds should be repealed by amending the Law and introducing zero tolerance for seed imports – as 0.1 per cent of GMO admixture can contaminate parcels planted with genetically unmodified seed during the blooming time.

However, like any other law, the Law on GMO is disrespected in practice because of the illegal import of GMO seeds, especially soybeans) and due to sampling only 4 to 7 per cent of consignments from imported goods. Phytosanitary inspection during soybean vegetation controls a small number of parcels and determines the presence of GM soybeans on about twenty hectares, which is only the "tip of the iceberg". If the data from these checks have been applied to the total area under soybean cultivation (over 150,000 ha), it would mean that 5,000 hectares of GM soybean are sown annually, which, with a yield of 3 t/ha gives an amount of 15,000 t or 750 tons of GM soybeans. This amount of soybeans ends up in the food chain of livestock on private farms of GM soybean producers or in smaller mixers for concentrated animal feed. The problem is the insufficient control, in particular, the absence of final information on the penalties imposed on offenders of the Law on GMO. That is the reason why I advise buyers of soybeans to buy the soybeans from the warehouses which have a control system for the presence of GM soybeans at the site or from the neighbours for which they know for sure that they do not grow GM soybeans.

EP ***Serbia has always been self-sufficient in terms of food production for the needs of its entire population; however, experts point out the absurd fact that we are increasingly exporting the products of the highest quality and uncontrollably importing the foods of foreign origin and low quality. How do you explain that?***

Vladimir Dimitrijevic Serbia is theoretically "self-sufficient" in terms of food production for its population. However, the global economy and its trends do not bypass our country either. Strive for higher profits dictates what will be imported and what will not. You can have moral dilemmas there, but rarely it happens for the profit not to prevail.

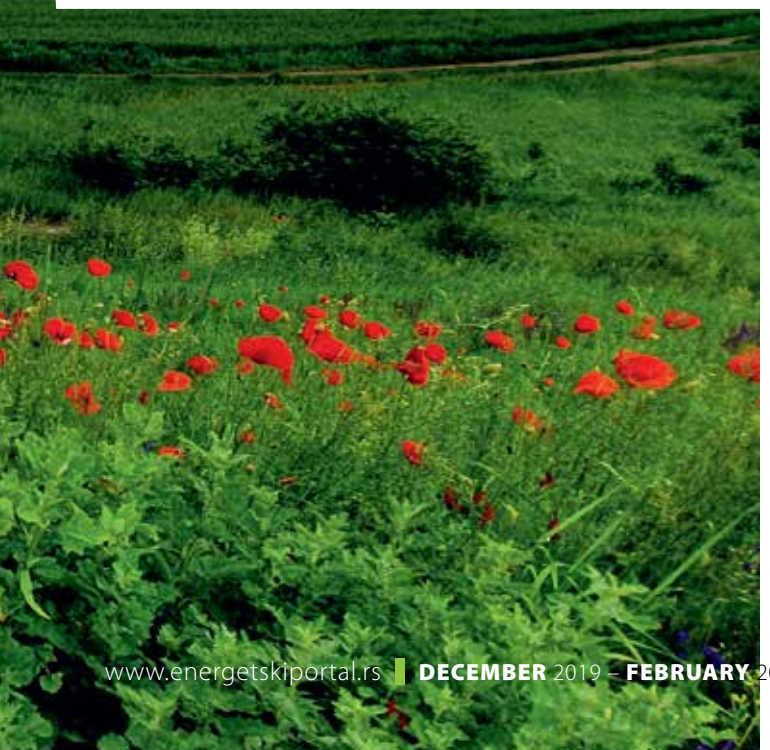
Miladin Sevarlic Serbia is in many ways a land of absurdities! Serbia is the largest exporter of genetically unmodified soybeans in Europe and is ranked 10th in the world exports of

Potograph: Mario Momcilovic

non-GMO corn. We are one of two countries in Europe that is self-sufficient in the production of non-genetically modified soybeans! Instead of processing this precious raw material into final soy products (soy flakes, soy milk, soy chunks as substitute for meat...) or using it in the diet of all types of livestock at a far greater number, and after slaughter in our slaughterhouses to process it into the final GMO-free meat products for exportation – we export unmodified soybean grain and thus lose significantly greater effect we could have on exporting derivates of our non-modified soybean. Due to connection between the import and the political centre of power, liberalisation of the market and the import of less quality and environmentally unsafe products, we are jeopardising the health of our population which is dwindling and ageing. However, one should also point out the very low purchasing power of most households in Serbia, whose monthly family budget is well below the minimum consumer basket and they are forced to buy goods that are cheaper regardless of the quality of these products.

EP ***There are data that 500 genetically modified organisms are registered on the planet which are directly used in the diet or as additives; public institutions own only 2 per cent of them while all others are owned by private companies, which brings us to the conclusion that private companies control the food system. Assuming that even states cannot institutionally control the GMO ingredients, how should an ordinary person form an attitude towards this vital issue? Does the reading of product labels mean anything at all?***

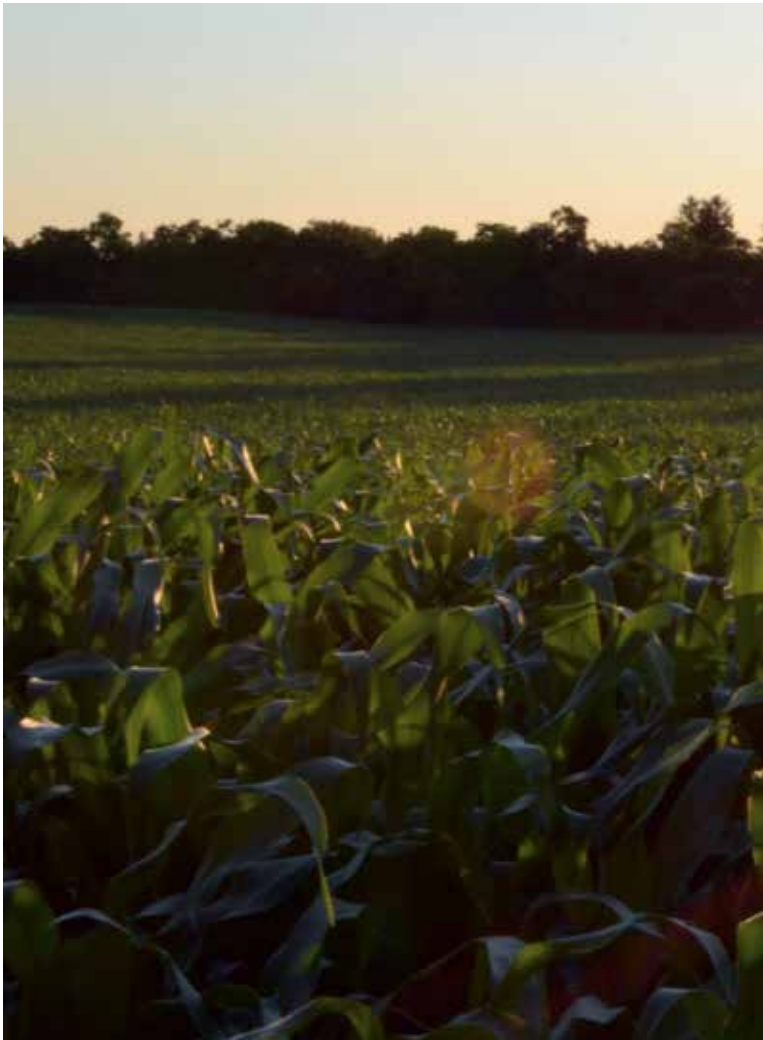
Potograph Unsplash/luann Hunt



Vladimir Dimitrijevic Concerning a large number of registered GMOs, the average resident comes into contact through food with a small number of products which have been modified in this way. The fact that manufacturing industries that deal with the production of GMOs are in the hands of private companies shouldn't have any impact on security controls. It is up to states to adopt adequate laws that will control all aspects of GMO production and distribution. After all, most of the industries that are the backbone of the economies in the world are owned by private companies (pharmaceutical, energy etc.); thus, where you will fill the car tank or which antibiotic you will buy depends on your personal choices. The same thing is applicable to the food you will buy. States should, through legislation,

protect the population from the uncontrolled production and distribution of all products, including GMO. Each GMO, before being placed on the market, must pass and it passes a series of tests for potential harmful effects to humans and the environment. The same applies to other products, from tires, through construction materials, all to food products which are declared as organic. GMO products, depending on the regulation, should be appropriately labelled and left to the consumer to choose whether to buy it.

Miladin Sevarlic In the period from 1996 to the present, there has been an expansionist increase in areas covered with GMO (from one to more than 180,000,000 ha), whose production also requires the use of pesticides based on potentially carcinogenic glyphosate. It significantly reduces the biodiversity of cultivated plants, pollutes soil, watercourses, wild flora and fauna, and poisons farmers who are under-protected when spraying parcels with total herbicides as well as consumers of such less safe agri-food products. I advise consumers to read the declarations on commercial food packaging and not to buy products from countries where GMO cultivation is authorised (USA, Argentina, Brazil, Spain...) or it is allowed to use GM corn-based livestock feed and GM soybean meals. When it comes to buying products in bulk, they should not buy meat if the country of origin is not indicated or to ask the salesclerk to



Potographs: (top) Biljana Gadjanski; (bottom left) Unsplash/Anh Nguyen

give them an invoice on the production origin, which they are selling, for insight. And always primarily buy food produced in Serbia, as we also prohibit the import, cultivation, processing and distribution of GMOs and GMO products! The activity of citizens and their associations is needed in areas in which Serbia is not doing enough in terms of protection against GMOs. I am particularly proud that the text of my Declaration against the import, cultivation, procession and placement of GMOs and GMO products, together with the later published similar text of the Greens of Serbia, from 2012 to 2016 was unanimously adopted by over 7,000 councils in 136 municipalities and towns in Serbia which is 80.5 per cent of local self-governments! Thus, thanks to the activities of numerous environmental and other associations and social responsibility of the councillors for the health of citizens, we implemented the action "Serbia without GMOs".

EP ***How careful are you when you buy food? Will you purchase meat and dry-cured meat products form a trusted vendor at a private butcher shop, or are you have confidence in the quality of similar products in large supermarket chains? Where do you buy apples and tomato? Which product will you never buy because you know that is full of harmful GMO additives and ingredients, even if it is allowed by the Declaration?***

Vladimir Dimitrijevic When buying food, I am generally guided by the quality and hygiene assessment. I often buy vegetables, fruit, fish, meat and meat products from vendors I have known for an extended period, which, I admit, is not an absolutely safe solution. Of course, I also buy food in large retail chains like most people living in the cities. I do not buy products for which I believe are manufactured and sold in unsanitary conditions. In the end, the uncontrolled use of insecticides, herbicides and antibiotics, as well as poor hygiene, will take a toll on us long before the GMOs.

Miladin Sevarlic Consumers in cities find it difficult to avoid buying contaminated agri-food products, on various grounds – from pesticide residues on fruit and vegetables, through artificial colours and flavours in confectionery products, to dairy and meat products imported from countries using growth hormones and GM corn and GM soybean meals in livestock feed.

For my household, I purchase meat and meat products, as well as fruit and vegetables for winter stores, either from relatives from the countryside of from well-known farmers who have their production and their own domestic processing. I never buy pâtés – but a spread of ground greaves and grease from known breeders of the Mangalitsa and Morava pig. I also do not buy hot dogs and bologna sausage, and as a guide what not to buy, I advise consumers to avoid buying in markets all meat products with price per kilogram lower than the price per kilogram of livestock. Each year, I purchase young roe deer and female wild boar from hunters, and we add that meat to the pig meat from family farms for the domestic production of bacon, ham, sausage and kulen.

Interview by: Gordana Knezevic

Potograph: Unsplash/Jake Gard

ABB'S SUCCESS FORMULA

Milan Jevremovic, Industry Segment Manager

Presenting a world-class company that achieves notable results in numerous areas can be a challenging task. One of those companies is ABB, which is paving the way for the future by introducing innumerable innovations in the power equipment, electric drive, industrial automation and robotics segments. That is just one part of their business, as ABB is recognised as a company (that is) very active in the fields of renewable energy and energy efficiency. It is natural that in this pursuit of innovation, they have not neglected electromobility. They have even joined forces with Formula E, revealing to us year after year how traffic will look in the near future. We asked Milan Jevremovic, Industry Segment Manager and Electric Motor Drives Sector Manager of ABB Serbia, how they would further develop ABB and in what areas their progress would most affect the growth of the whole society.

EP ***How would you present the company you work for? Would you point out a ground-breaking partnership with Formula E?***

Milan Jevremovic ABB is an innovative technology leader leading the digitalisation of the industry. With a legacy of over 130 years of innovation, today ABB is comprised of four global customer-focused business sectors: Electrification, Industrial Automation, Motion and Robotics & Discrete Automation, all supported by the common ABB Ability™ digital platform.

In addition to products that directly or indirectly reduce energy consumption, whose innovations we are constantly working on, we also offer solutions for almost every type of industry. There is also a range of products for renewable energy sources that our teams are constantly refining to make the most of these types of green energy.

We are also teaming up with Formula E in a revolutionary partnership to foster the future of sustainable e-mobility. As the title sponsor of this competition, we have been raising environmental awareness for the sixth consecutive year and working on improving e-mobility.

Since its first race in Beijing in September 2014, Formula E has proven to be the number one in all international electric motorsports. In the next phase of development, the global leader in innovative technology, ABB gives its name, innovation and technological leadership to the series, which will now be known as the ABB FIA Formula E Championship.

Formula E serves as a concrete platform for the development and testing of electrification and digitalisation technologies relevant to e-mobility, helping to improve the design and functionality of electric vehicles and infra-

Photographs: ABB

structure, as well as related digital platforms. By joining forces, ABB and Formula E are ideally positioned to push the boundaries of e-mobility.

EP ***As a responsible company, ABB also participates in the education and professional practice of students of electrical engineering. So far, you have had many donations and competitions for students. Which ones would you single out as most important?***

Milan Jevremovic For many years ABB has been cooperating with all faculties of electrical engineering in Serbia through various activities. This year ABB donated top-quality equipment that made it possible for the H-Bridges team FROM the Faculty of Electrical Engineering to test their

The newly opened Nikola Tesla Training Centre is the only one of its kind in the region where ABB engineers, as well as their partners and users, can be trainedon the latest equipment

prototype converter for electric bikes, which we believe helped them win first place in the International Future Energy Challenge (IFEC). Since ABB Serbia donated equipment ten years ago, when this team also won first place in the IFEC competition, I think we found a formula for success.

Through many donations to the various departments of the Faculty of Electrical Engineering in Belgrade, the Faculty of Technical Sciences in Novi Sad and the Faculty of Electronic Engineering in Nis, ABB continually assists these faculties so that students have access to and keep up with the latest technologies. In addition to donations to faculties, ABB also helps electrical engineering high schools.

Last year, we also established our robotics competition that we plan to make a tradition. Namely, ABB Serbia is the general sponsor of the competition called "ABB Robo Challenge – Touch the Future" within the seminar "Brand New Engineers – From Integral to Engineer", organised by the Association of Students of Electrical Engineering of Europe (EESTEC) in cooperation with the Faculty of Electrical Engineering, the University of Belgrade.

The second ABB Robo Challenge Student Competition was held in mid-November. A total of 12 formed teams competed in a 24-hour hackathon that involves working on a computer in the form of optimising a robot management solution in the ABB RobotStudio, software simulation environment. The two best teams made it to the finals and had the opportunity to implement their solution on a real ABB industrial robot.

Back in 2012, we established the annual award for the best student in a group of subjects from the Electrical Drives, the Faculty of Electrical Engineering, the University of Belgrade.

That is only part of what ABB has been doing for years to give students the opportunity to get the best possible application of knowledge in practice, and of course, we will continue to strive to provide them with an even better practical education.

EP ***When it comes to renewable energy sources, ABB also has success in this regard. Is this year even better than the previous ones, given that things are slowly changing in Serbia and both companies and individuals are thinking about the renewables more and more?***

Milan Jevremovic Our company has been working on solar power plant projects since 1990, mostly in the field of solar inverters, but also in switchgears and substations for this application. The number of solar inverters we have installed so far is slightly less than two million units, and the total power of the solar power plants that ABB participated in exceeds 20 GW.

When it comes to Serbia, more than 70 per cent of installed inverters at all solar power plants are manufactured by our company. We are most proud of the 2 largest solar power plants – Solaris 1 and Solaris 2 – which have almost 2 MW of installed power in total, but also the solar power plant on the roof of the IKEA department store with the installed capacity of 300 kW.

After a slight slack in the last two years, the solar power market in Serbia has awakened this year. For industrial plants, the construction of solar power plants has become cost-effective due to changes in the price of electricity and the fall in the price of equipment, which is why more and more companies in Serbia are opting to invest in solar power plants, even without state incentives. These are also the reasons why we sold another megawatt of solar inverters for three power plants this year. The installation of solar panels is also becoming profitable for households, and therefore a slight increase in installed solar panels on the roofs of houses across Serbia is quite logical. We expect that interest in solar energy will become even greater due to the new increase in the price of electricity that is about to come.

When it comes to other renewables, I must point out the important point that ABB participated in connecting all wind farms built in Serbia to the distribution system. It is very likely that some pieces of our equipment are contained in the wind turbines themselves, but we do not have this information since they come with the equipment already installed.

EP ***In your opinion, what else does the state need to do to have more solar panels on the roofs of our buildings and houses since a significant number of sunny hours in Serbia enables the use of this energy?***

Milan Jevremovic The time of financial incentives for solar power plants has passed, both in the world and in our country, primarily due to falling prices and availability of equipment. The state should facilitate the procedures for construction and the possibility of transferring energy to the grid, and thus enable a larger number of small producers to connect to the system more easily. There is an economic calculation right now, but people give up because of extensive and complicated procedures. The state needs to simplify this, and then the number of solar panels on the roofs of our houses and buildings will increase.

We hope that "net metering" will be introduced soon, and the by-laws are being drafted by the Ministry of Mining and Energy, which would greatly help to promote this energy source.

EP ***Several wind farms have been built in Serbia, have any of them installed ABB equipment? Do you expect a higher share of wind farms in the energy mix?***

Milan Jevremovic As I mentioned earlier, ABB equipment is installed in all wind farms in Serbia. Starting with our biggest Dolovo wind farm with ABB protection and high voltage equipment installed at 400 kV plant, then in Kovacica wind farm – 220 kV plant where complete ABB equipment was installed, at 110 kV substation in Alibunar wind farm, and right next to it also 35 kV substation Mali Bunar. Besides, ABB's equipment also exists in smaller wind farms in Kula and Pecinci, where our medium voltage equipment is installed. We will continue to participate in the construction of wind farms, as their number will increase in these areas since four more parks have been planned in Vojvodina, as well as the wind farm planned by EPS in Kostolac. There are also two reasons for this increase. The first is the new feed-in tariffs expected from the state, and the second reason is that, regardless of the state's privileges, private individuals will make their arrangements for exporting that green energy or eventual sale in Serbia.

EP ***ABB's technological advancements have been built into the world's second largest hydropower plant. Can you tell us a little more about that?***

Milan Jevremovic In the area of hydropower plants, ABB has comprehensive technological knowledge necessary

for the optimised and efficient operation of the plant, from mini hydropower plants to large reversible hydropower plants. With a tradition of over 125 years in the development of technologies and solutions, ABB has acquired competence and experience through the execution of hundreds of projects around the world and through various services throughout the life span of the hydropower plant.

ABB offers integrated solutions for instrumentation, control and all electrical equipment required in power generation – from planning to service support during exploitation. The seamless integration of energy and automation provides customers with comprehensive operational capabilities with all the information they need about the process, field equipment and electrical components.

EP ***ABB's fast chargers stand out from the competition. However, there are only a few fast ones in Serbia but still no ultra-fast chargers. Is there any indication that this will change anytime soon, even though the state is not ready to give higher subsidies in the next year?***

Milan Jevremovic ABB keeps track of the development of new generations of cars and launches new products that

keep pace with their innovations so that now new generations of cars can accept some faster and stronger chargers.

Serbia still does not have a clear plan for this area. The state must take the first step to motivate people to buy electric cars. It can be done in various ways, either through subsidies for the purchase of electric vehicles themselves or through major investments in the network of electric chargers. Currently, in the absence of both, people have a hard time deciding to replace their car with an electric one. In neighbouring Croatia, for example, HEP has decided to invest in a network of electric chargers, and this year ABB has delivered almost 70 fast-charging stations that will be installed in the first phase of this project. Private investors also do not want to take the first step and develop infrastructure without subsidies. The only one in the world who did it was Ilon Mask. It allowed Tesla car buyers to charge at Tesla's chargers for free, and that lasted until last year. Because of this benefit, people decided to buy Tesla, because they could refill their cars for free. That is now being phased out, alas, an avalanche has already been launched.

EP ***Very often professors from the Faculty of Electrical Engineering appeal for the necessity of repairing the state of the electricity grid in the whole of Serbia, and especially in Belgrade, where the load is the highest. Is there an ABB solution that we can implement and solve this problem?***

Milan Jevremovic Electricity consumption had clearly defined seasonal and daily patterns which have changed in recent years. First and foremost, because of changing consumption patterns but also the increasing share of renewables in production. Seasonal peaks were previously higher in the winter due to electric heating, but with the changing climate and the widespread use of air conditioning, this is changing. It is very similar to the production that was previously mostly from thermal power plants and hydropower plants. With the introduction of new forms of renewable sources, the production model has changed. Charging electric cars, which takes place mostly at night, can make the situation even more complicated.

Electric power systems were designed many years ago, and therefore they require significant investment. The state of the grid in Serbia is not great and it will need adjusting to new conditions, where some software solutions for network management can help. Still it will also be necessary to increase the capacity of substations.

The quality of delivered electricity has become increasingly important in Serbia lately, with special attention being paid to industrial plants and factories as they improve their production processes and introduce new and sophisticated technologies that require a reliable and high-quality power supply. Thereby, I mean not only the stability of the grid, but also the quality of the electricity itself, which means that there are no voltage drops and other disturbances that can come from the grid, but also from the consumption itself, where non-linear consumers today have a much higher share than they used to.

In some parts of Serbia, the quality of electricity is not high, but ABB has solutions for it. Power quality improvement devices based on the latest generation of power electronics are capable of solving different problems such as voltage collapses, higher harmonics, negative power factor... With ABB Ability digital platform, ABB also provides various software solutions for monitoring and analysing power consumption and power quality that helps users identify where potential problems are and take action.

We at ABB Serbia also have top quality instruments for measuring and testing the electric power quality, as well as the expert staff who, in consultation with clients, can perform analysis and propose one of the solutions.

EP ***Given the fact that it is the end of the year, what are your plans for 2020?***

Milan Jevremovic We will be dedicated to improving our newly opened Nikola Tesla training centre. It is the only one of its kind in the region. In it, our engineers, as well as partners and end-users, can be trained on the latest ABB equipment we sell in these markets so that they can more easily apply new ABB technologies to their projects or factories. That is another investment in knowledge and expertise. We will also focus on the mining segment as it is a branch of the industry that will be developing, both because of investments in Bor and Majdanpek and the opening of new mines and the growing need for coal. In the last two years, the sector of modern residential and commercial complexes has been developing in Serbia, so our focus will also be on smart solutions that are implemented in such facilities. We hope that electric cars will experience expansion on our roads, and therefore we plan to focus on electric chargers as well.

Interview by: Nevena Djukic

CAN BY CAN – YES, I CAN!

All good ideas have something in common – it always appears to be some ever so logical and simple solution where such an idea found its implementation. The same goes for the innovation by local start-up Solagro. They made a crusher that grants points whenever you "feed" it with a can.

The crusher isn't a new invention. Still, in Solagro design, it is substantially different. It was made to motivate users to recycle, and companies that take care of social responsibility to place it on their premises.

Marko Kalicanin and Nemanja Janic, a founding couplet of this team with the numerous innovators, have come up with an idea of valuating each can that user recycles after their experience with the first mechanical presses which they had made and placed at the festivals. Nemanja, the Solagro CEO, says that people respond in a positive way to otherwise somewhat sterile process of recycling if their effort is rewarded.

"Recycling is a generally hideous and repugnant task which we enhanced with an element of the game so that users might find it more interesting and inspiring. Based on our own experience, we know that a reward system forms a habit of separating and recycling the packaging that still prevails even when such an 'incentive' is long gone."

What rewards await those who diligently pop cans in the Solagro crusher, we asked Nemanja, and he pointed out that there is a variety of rewards. Still, it depends mainly on visitors' structure and the type of event where the crusher will be placed.

"The most appealing rewards are usually available at the most popular music festivals. It is up to the festival organizers to provide the rewards, with our assistance provided, whereas our start-up sets up the digital platform and the recycling system. The most wanted reward this year was undoubtedly an electric bicycle which we gave away on the Manifest festival. However, let me single out rides in an air balloon, helicopter and aeroplane, dinners at restaurants, theatre tickets, and weekends for two at the resorts in Serbia etc. And that isn't all. The visitors had a chance to delight in ice-creams, beverages, but they were also getting books, toys etc."

Along with Nemanja and Marko, the latter is in charge of research and development, their team comprises the developers Milos and Aleksandar, electronics technician Igor, and Tamara, who is the project manager. Originally, Solagro team contained 6 members, all of them were students of the last year at the Faculty of Agriculture at that time and the volunteers at the Public Utility Company "Gradske pijace" in Belgrade. Today, some of them hold a PhD degree, and others are skilled engineers for irrigation in Israel, bankers in Ecuador, or excellent alcohol technologist. At the same time, Nemanja and Marko set up Solagro following their vision.

When it comes to role distribution between the team members, according to Nemanja, that was a piece of cake.

Photographs: Solagro

"Marko, although not a mechanical engineer, has a profound talent for device design. More than 200 of devices hitherto made, were designed and engineered by him. On the other hand, I am in charge of sales, negotiations, client relationship management and our presentations at the contests. Together we make a pretty good team, so the rest of the current team members just followed us in stride."

More than a year ago their invention for can recycling found its way into the selection of the best 15 start-ups at the contest PowerUP!, being picked among three hundred innovations submitted from all over Europe. They arrived at the European finals of the contest PowerUP! in Prague as winners of the national contest held in May 2018 and organized by Startit. The finals and their presentation in Prague have contributed by and large to making valuable contacts and realizing West European market's requisites when it comes to innovations in environmental protection so that smart crushers could be placed and marketed in those markets in an easier way.

After the finals of this contest in Prague, they showed up at the finals of another prestigious competition in Frankfurt called Clim@ competition, where they were selected among 12 finalists from all over the world. This year, thanks precisely to this competition, they got the support from

Green for Growth (the organizer of the Clim@ competition contest) for campaign Smart Recycling in 2019. Also, at the beginning of 2018, they got the grant from the Innovation Fund of the Republic of Serbia through Early development programme to enhance further this system. In July 2018, they were among just a few Serbian start-ups who had a chance to present themselves at the Western Balkans summit in London.

Today Solagro crushers are in use in nine European countries. The citizens of Belgium, Spain, Ireland, Greece, Romania, Austria, Montenegro, Slovenia and Croatia throw cans into the crushers, made by our innovative team, and from there, cans go directly to recycling, so that in 60 days they would be ready to go back on the shelves. Soon, the first smart crusher will make its way to Africa. Nairobi, Kenia's capital, will get its first Solagro crusher, confirms Nemanja and adds that so far in our country their patent for can recycling has been used mostly at the festivals and other massively popular events.

"From the very beginning the start-up Solagro had a strategic partner in the Recan Foundation who has been helping our innovations first to see the light of day, and later supporting their implementation at numerous festivals in the country and abroad. Still, our ideal buyer would be a big company which deals in the packaging industry (e.g. Ball Packaging) but also all other bottling plants such as Coca-Cola, Heineken, Molson Coors etc", says Nemanja sharing with us that their goal is to make a strategic part-

nership with one of those big companies. "We have made it with Ball Packaging, the biggest can producer in the world."

It is common knowledge that aluminium cans go through the recycling process countless times, without losing their quality. Discharging of crusher is a duty of a national operator such as Sekopak or the organization "Every can counts" whereas the income coming from the recycled material goes to the crusher owner, but mostly to the association "We live together".

Innovations have marked the whole development process of the Solagro company. Nemanja affirms that they cooperated with the Public Utility Company "Belgrade City Markets" that resulted in placing one of biodigester for organic waste at one of the markets. "Ever since that, the inventions have just kept on coming. Those include solar power drier for fruits, vegetables and herbs, solar power oven for cooking in nature without smoke and fire, solar system for irrigation and smart crushers which are these days in demand but also other smart appliances for collecting packaging waste." Although they haven't had time to develop all the patents fully, it is quite clear that they do not lack ideas and conceptions which might help the protection of the environment we all share.

We hope that their mobile crushers with the engaging appearance will become commonplace at cities' squares, at various shows and other places where a lot of people get around. Naturally, while waiting for this creative team to amaze us with another of their designs which will allow us and facilitate waste recycling.

Prepared by: Tamara Zjacic

INVESTMENTS IN BETTER LIVING CONDITIONS AND SUSTAINABLE SOLUTIONS

KfW is a financial institution for domestic business, namely in Germany, but also for countries in the processes of development and transition. In addition to its headquarter in Frankfurt, it has regional offices in almost 70 countries in Africa, Asia, Latin America and South-East Europe. KfW Development Bank acts on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). It is responsible for Germany's so-called "Financial-Cooperation" activities within the area of development cooperation. We talked with Arne Gooss, the director of the KfW office in Serbia, about their investments, which now have reached almost EUR 2 billion, about ongoing Programme for entrepreneurship and self-employment promotion, about the outcome of activities taken for energy efficiency improvement as well as about other issues.

EP ***What is KfW's geographical scope and who exactly might be supported by KfW in this region?***

Arne Gooss Our main focus in Serbia is its preparation for a future EU-accession and to help Serbia meet the targets of the acquis communautaire especially in the sectors of

ARNE GOOSS studied mechanical engineering and business economics at the Technical University of Berlin. After graduating in 1993, he worked as an economist for GOPA-Consultants in Germany and German Railway International focussing project development in Southeast Asia and Eastern Europe.

Mr. Gooss is Director of KfW's Belgrade Office since 2015. Within his previous posts at KfW he was heading the Division for Urban Infrastructure in Eastern Europe, the Caucasus, Central Asia (2011 – 2015) and he was Director of KfW's Beijing Office (2004 – 2010). He started in KfW Development Bank as Project Manager for urban infrastructure in Asia in 2000.

Photographs: (Arne Gooss) courtesy of Arne Gooss; (all others) KfW

energy, water supply and disposal, waste management and environment. Besides this, we also promote sustainable economic development by providing credit lines for micro, small and medium-sized companies and municipalities. The choice of companies that could be supported by KfW depends on local needs and the general conditions in place. KfW Development Bank finances investments and reform programs that create better living conditions for the population and offer sustainable and climate-friendly solutions.

When we speak about Serbia, it can be differentiated between activities in the public and the private sector. For instance, in the public sector, we are active in the areas of energy and environment, which includes projects for energy efficiency, renewable energies, water supply and sanitation, as well as waste management and biodiversity. With our activities in the private sector, we aim to reach small and medium-sized enterprises (SMEs) and businesses with a positive social and environmental impact through which Serbia's society as a whole can benefit.

EP ***When the KfW programme of emergency support was launched in November 2000, aimed at the energy import and spare parts procurement, its budget was 70 million euros. It was all spent to provide stable electricity supply. It was almost 20 years ago. Are you familiar with what was the situation in the energy sector back then, especially in the aftermath of 1999?***

Arne Gooss The critical situation in post-war Serbia was the initial reason for German engagement in the energy sector, so we remember the situation very well. The Serbian energy sector was facing significant deficiencies in electricity supply after 1999, and the Serbian coal sector dropped from one of the most modern in the region at the end of the eighties, dramatically in the late nineties. With the KfW Emergency Aid Energy and Untied Financial Loan Energy programmes a contribution was made to stabilising the political and social climate and power supply in Serbia, the latter largely benefiting private users but also industry and trade. Both programmes were designed to support the new pro-reform government. At programme appraisal in 2000/01, Serbia was in a complicated process of political change. Regular and protracted load sheddings in the power sector seriously affected the conditions of life. Both programmes contributed to remedying this core problem. At programme appraisal, the

Serbian government had a clear and understandable interest in stabilising the power sector.

Besides our efforts, the Stability Pact for the Balkans accompanied by an aid programme being established on a Conference of Foreign Ministers convened by the EU on the initiative of the German government came into force in June 1999. Today Serbia is still aware of the sizeable economic importance of the energy sector and is continuing with its effective development to meet the EU acquis. While these and other earlier projects were aimed at ensuring a stable electricity supply, more recent projects have focused on making the energy sector more environmentally and climate-friendly by promoting energy efficiency and renewable energy sources.

EP ***The investment in Serbia by KfW reached 1.9 billion euros. What sectors are chosen to invest in, and why is it important to help small business to expand too? What kind of companies has the priority for financing?***

Arne Gooss From the total investment amount of roughly EUR 1,9 billion that KfW Development Bank invested in Serbia since 2000, around EUR 1,3 billion EUR went to projects in the public sector and EUR 600 million in the private sector. As I mentioned before, in the public sector our work concentrates on energy and energy efficiency with a focus on renewable energy in wind and hydropower, as well as

sustainable infrastructure, particularly in water supply and sanitation, wastewater, solid waste and biodiversity. In the private sector, we concentrate on loans for SMEs and municipalities. SMEs are of particular importance to us because they represent the backbone of the Serbian economy. SMEs in Serbia employ more than 66% of all employees and represent more than 99% of all economic entities in Serbia. In particular, KfW Development Bank aims to introduce new products in the financial market and to help SMEs to achieve easier access to these products. For this reason, SMEs have the priority for financing.

As you might know, in 2000, SMEs had limited access to loans. Private individuals with a low or medium income

THE INCENTIVE FOR A BIGGER SHARE OF WIND POWER PLANTS IN ENERGY PRODUCTION

According to Arne Gooss, the wind farm Kostolac with the capacity of 66 MW is their first project in the field of renewable energy sources in Serbia. By the amount invested, it's also one of their most significant projects. For this project's realisation, KfW Development Bank provided a loan of EUR 70 million.

"The involvement in the sector of renewable energy is especially important to us because in Serbia energy consumption per unit of gross domestic product is four times higher than in Central Europe and continues to increase. The domestic electricity sector used to be poorly diversified and mainly dependent on older power plants with high rehabilitation needs. The lack of funds in the Serbian electricity sector and high public debt prevented the financing of much-needed investment, especially in the area of modern environmental technologies and renewable energies", says the director of KfW's office.

Energy production, which is based primarily on lignite, pollutes the environment and the climate due to high pollutant emissions. The transformation of the energy sector from fossil fuels towards climate-friendly production and more efficient energy use poses major challenges. With the funding of the Kostolac wind farm, we expect to contribute to the utilisation of wind power, as the enormous potential of wind energy as a way of climate-friendly energy production has hardly been exploited so far. Additionally, we expect to help Serbia meet the target of 27 per cent of the energy generated from renewable sources by the year 2020 as well as to realise CO_2 savings of up to 122,000 tons per year.

had almost no access to financial services. To solve this problem, KfW Development Bank, ProCredit Holding, Commerzbank, the European Bank for Reconstruction and Development (EBRD) and Dutch Development Bank FMO conjointly founded ProCredit Bank of Serbia. Also, together with the most important donors in Southeast Europe, KfW Development Bank established the European Fund for Southeast Europe (EFSE) in 2005. EFSE successfully activated private investment intending to increase the scope of loans for SMEs in Southeast Europe. By the end of 2017, its loan portfolio equalled EUR 131.4 million for more than 100,000 small enterprises. The way of financing SMEs today through KfW Development in Serbia is in place since 2007.

Our most recent program in cooperation with the Government of the Republic of Serbia represented by Public Investement Management Office and the Ministry of Economy as well as the Serbian Chamber of Commerce (PKS) is the Programme for entrepreneurship and self-employment promotion (PESEP). This program aims to make a continuous contribution to the development of a sustainable entrepreneurial culture in Serbia, to increase the competitiveness of the Republic of Serbia and to build an economy based on entrepreneurial spirit. By implementing this program, the Republic of Serbia seeks to encourage citizens, especially young people, to think in an entrepreneurial

way, as well as to help them to set up their companies to a greater extent. The emphasis is on strengthening local and regional initiatives that should deliver the most immediate results and contribute to the growth of economic success, job creation and retention of young people in the Republic of Serbia.

EP ***Recently, promoting energy efficiency and renewable energy sources have come into the KfW's focus. The result should be a more environmentally friendly energy sector. How far have you gone with the plan of the rehabilitation of hydropower plants in Serbia?***

Arne Gooss For reaching the goal of a more environmentally friendly energy sector, we are active in energy efficiency, where we work closely with the Ministry of Mining and Energy (MoME) and the Office for Public Investment (PIMO). In the field of RES, we see the reconstruction of ecologically friendly hydropower plants as one key component of sustainable energy generation. The rehabilitation of the hydropower plants Bajina Basta and Zvornik, financed by favourable loans of EUR 100 million, was one of the first projects in the area of renewable energy resources. The Bajina Basta and Zvornik hydropower plants were built in 1968 and 1955 and have exceeded their economic and technical life. Without extensive refurbishment and modernisation the two hydropower plants' electro-mechanical units would suffer from serious malfunction. The project includes the rehabilitation of the turbines and the modernisation of the electro-mechanical equipment in both hydropower plants. The Bajina Basta and Zvornik projects have increased their capacity by 15 per cent and 25 per cent, respectively. In total, 460 MW of installed capacity have been rehabilitated, and 77 MW of power were additionally commissioned. This way, we increased the efficiency of production from RES. Also, the turbines have been overhauled in both power plants, and their service life has been extended by 30-40 years. The continued operation of the power plants avoids CO_2 emissions of around 1.9 million tons per year (compared to electricity production in a coal-fired power plant).

EP ***In cooperation with the EBRD, KfW financed the introduction of a coal quality management system in Serbia's largest mining area Kolubara. We are at the moment in the middle of the crisis concerning air pollution. As it seems, and official monitoring review confirms it, the majority (especially when it comes to PM10 and PM2,5) of it comes from thermal plants. How much will that novel system reduce CO_2 emissions?***

Arne Gooss In the field of electricity production, KfW, in cooperation with the European Bank for Reconstruction and Development (EBRD), participated in financing the introduction of a coal quality management system in Serbia's largest mining area Kolubara. There is a great need for an environmentally friendly coal quality management system that significantly reduces CO_2 emissions. With the introduction of an open-pit coal quality management system in the western part of the Kolubara mining basin, coal-fired power plants should receive a uniform coal quality for energy production. The total cost of the project is EUR 182 million, with EUR 74 million from KfW and co-financing from EBRD with EUR 80 million and EPS with EUR 28 million. The project enables a more efficient and cleaner energy production and reduces CO_2 emissions by approx. 700,000 tons per year, SO_2 emissions by approx. 3,800 tons per year and NOX emissions by approx. 800 tons per year. Besides, the more efficient coal quality management will save EPS EUR 25 million annually, so it will save not only a notable amount of greenhouse gases and pollutants, but also costs.

EP ***How many ongoing KfW programmes aimed at the improvement of the system of district heating are there at this moment? Has the consumption-based calculation system turned out to be efficient, and how do you ensure proper maintenance of the pipeline and other installation you financed for?***

Arne Gooss Since 20 per cent of the 2.5 million households in Serbia are connected to district heating systems which are often in a very poor technical condition, with large water and heat losses and very high emissions, this area is of particular importance for KfW Development Bank. The fourth phase of the program on the rehabilitation of district heating systems has been completed, and the fifth phase is currently in preparation. The program covered 22 municipalities and an investment volume of more than EUR 100 million. For the continuation of the program, Germany has earmarked an additional amount of EUR 32 million. In addition to focusing on the modernisation and expansion of boiler plants, the maintenance of pipeline networks and the installation of measuring instruments, this program also promotes the staff training and the introduction of consumption-based tariffs. We take care of good maintenance by financing knowledge transfer as one part of our sustainability measures. By financing training and upskilling, we carry out institutional reforms that contribute to improving the sustainability of our projects and ensure long-term benefits for the Serbian economy.

The installation of the heat meters, which is now completed, has led to a clear change in awareness. A typical example of this is the fact that while consumers previously complained about insufficient heating (when individual heat consumption was irrelevant to them). In contrast, the complaints received today tend to be the opposite, namely that there tends to be too much heating. Overall heating consumption decreased by 20 per cent to over 30 per cent, and in general, consumption fell by well over 10 per cent. Furthermore, it was possible to reduce water losses in the district heating networks significantly. The greater transparency in heating cost billing and the improvement of the heating supply in the target locations has had a positive impact on the living conditions of the affected population (an estimated 200,000 people in total). It also has a nationwide impact on the reduction of greenhouse gas emissions. In addition, due to reduced losses and more efficient production, district heating companies can operate more sustainably. We are currently, in cooperation with the Swiss Cooperation Office in Serbia (SECO), also engaged in a program that supports district heating companies converting to biomass as a more sustainable energy resource, for example in the municipalities of Priboj and Mali Zvornik. It enables the development and use of renewable energy resources and thus the reduction of fossil fuels and improves access to climate-friendly, efficient and reliable heat supply. We consider this an important step towards EU integration and an active contribution to CO_2 and SO_2 emission savings in regards to global climate protection.

EP ***The project "The protection of biodiversity and water of the lakes Palic and Ludas" is funded by 6.5 million euros donated by the German government and an additional 1 million coming from the local budget. By the time it is over, in 2021, those two lakes will have good infrastructure, the great water quality which ensures a lot of fish and bird population and will have the future as a great tourist destination. What were the biggest issues concerning this project?***

Arne Gooss The implementation of the project started in September 2018, so roughly a year ago. After Lake Ludas was placed under the protection of the RAMSAR Convention in 1977, it is – together with the neighbouring Palic Lake and the sandy areas of Subotica – an internationally recognised area for the protection of plant species and birds. It is connected to the neighbouring Lake Palic by a channel which serves as a collector of sewage for Palic and its surroundings, what also means that Ludas is almost exclusively fed from Lake Palic.

Over the years of human modification of the water regime and high nutrient inputs from sewage and agricultural activities, the character of both lakes has fundamentally changed. The objective of the project is to improve the quality of water in the Palic-Ludas water system so that a "potentially natural state" can be established, taking into account that people live in the catchments of lakes and use the adjacent land. The hygienic disposal and treatment of wastewater at cost-effective and socially acceptable prices, including improved nutrient elimination, is one subgoal of this program, besides the protection of biodiversity through the construction of a buffer zone. So, when looking at the challenges of the program so far, the lack in the sewage system is one of the biggest. This does not only concern the lack of development of the sewage system but also the adjustment of all parameters that play a role in the ecological balance of the lake.

Interview by: Tamara Zjacic

NOT A WASTE OF BREATH

Although it is imposed on him, due to his job and career, to watch seas and oceans from a different perspective than most people and, therefore, he notices what is hidden on the dark bottom, the famous Croatian diver, Goran Colak believes that people around the world are aware of the amount of waste we are surrounded by. The recorder in free diving confirms that part of that waste has found its place on beaches that look different than thirty years ago.

Goran believes that the problem is underdeveloped people's awareness of how alarming this situation is. "People don't understand the real damage and danger of plastic and microplastic. Everyone is busy with primary

"When you look at the planet from the orbital perspective, there are no boundaries, just **one big closed ecosystem that we are all in together**, whether you like it or not."

Photograph: Courtesy of Goran Colak

survival, especially in countries like yours and mine, but still, it isn't hard to refrain from throwing plastic bottles in the street or the sea. It requires no effort, just common sense."

As an experienced diver who travels very often and dives in different parts of the world, Goran has a lot to say about the situation outside the Adriatic, which he finds extremely polluted, even more than the average tourist on the Adriatic coast can see. "Wherever I dived in the Adriatic, I was greeted by the sea. But the sea of bottles, bags, tires, wreckages, and boilers. Winds and sea currents bring additional, huge amounts of garbage from Albania, which linger in coves. When I was diving in Mljet, I was seeing that all the time. However, we are still clean compared to some economically less developed countries."

Pollution, he says, knows no boundaries. "When you look at the planet from the orbital perspective, there are no boundaries, just one big closed ecosystem that we are all in together, whether you like it or not." The absence of a waste separation culture is considered as a big problem, and it should be the first step in solving the problem of plastic waste.

Still, he believes there is a cure. "Small advances of individuals can make a huge difference. If each one of us recycled his one waste or just disposed of it improperly, the situation would be much better."

"The microplastics made up of the smallest particles, created by the decomposition of plastic, **currently form an integral part of the living world in the sea**. That's where they get into us"

It seems a bit pointless, Goran explained vividly, if "we clean and the others dump the garbage on the other side of the fence", alluding to the need for everyone to participate in the fight against waste. The most logical order of work to solve this problem involves reducing the amount of waste which every person produces every person individually, then local units, state and governments, down to the global level.

Indeed, there are numerous inventions and actions that contribute to attempts to prevent the accumulation of waste around the world. Recently, a group of Dutch researchers introduced a cleaning project, which also enables the collection of microplastics and tried it out in the Pacific.

GORAN COLAK, the best Croatian diver and the world record holder in freediving, has been a world champion in AIDA competitions since 2009. He won more than 20 world medals in freediving. He is the protagonist of the documentary "My Life without Air", directed and recorded by Bojana Burner. He is extremely interested in the conservation of the environment, and he wants to draw public attention to the situation in the seas and oceans and the increasing plastic pollution of the underwater world.

Photograph: (background) Daan Verhoeven; (Goran Colak) Branko Starcevic

"The microplastics made up of the smallest particles, created by the decomposition of plastic, currently form an integral part of the living world in the sea. That's where they get into us," says this world-renowned freediver who joined the appeal of Split-based organisation Green Sail in June to send a clear message to his fellow citizens about the need for personal responsibility in waste management. It is crucial that we take immediate steps regarding using plastic while there is still time, says Goran.

In his opinion, information about these problems is not sufficiently represented, at least not in our society. Consequently, people are neither informed nor aware of the danger to a sufficient degree.

"By no means do we realise that all of this is our common problem, and as such, it concerns everyone, without exception. We need to be aware that we have to save ourselves alone because the planet can function without us since it goes through constant periods of renewal", warns Goran adding that all we need to do is be guided by common sense – we should ask ourselves where in our yard or house to dispose of waste that we will take care of later.

Prepared by: Jelena Cvetic

"Wherever I dived in the Adriatic, **I was greeted by** the sea. But **the sea of bottles, bags, tires, wreckages, and boilers"**

3 REASONS WHY SINGAPORE IS THE SMARTEST CITY IN THE WORLD

It's official: Singapore is the world's smartest city. That's according to a new survey Published by Swiss business school IMD and the Singapore University of Technology and Design - the IMD Smart Cities Index - which looked at how well cities are adopting digital technologies and improving the lives of the people who live there.

WHAT IS A SMART CITY?

Looking at aspects such as public safety, mobility, governance and health, the index measured cities' performance on maintaining green spaces, improving existing local institutions, and digitalizing access to employment, all while maintaining the security of their citizens.

Smart cities are committed to improving the provision and development of urban services through the use of digital technology.

Here are three ways Singapore is smarter than the average city.

1. HEALTHIER CITIZENS MEAN HEALTHIER CITIES.

How a city's leaders shape the future of healthcare will ultimately determine how the prosperity of the city itself and of its citizens. A healthcare ecosystem that celebrates continuous learning and innovation, builds communities and offers reliable specialist care is essential. Moreover, how well is a city's leadership putting empathy at the heart of its healthcare infrastructure?

In Singapore, a key example of this is the development of Healthcity Novena - a masterplan for community-focused health in which infrastructure such as pedestrian walkways, underground car parks and outdoor green spaces exist to complement and ameliorate the citizen-patient experience. A city whose leaders proactively think about these aspects of healthcare provision will inherently be a healthier one.

2. A HOUSE WITH A HEART IS A HOME.

Singapore's Housing Development Board (HDB) offers all citizens access to free public housing. Furthermore, the country's leaders have created public housing that is more than just an apartment space; it also stretches into larger community areas that integrate liveability, sustainability and growth. More than 80% of the country's population lives in public housing, which means the provision and administration of housing is pivotal to the identity and character of a diverse city like Singapore. The country's leadership is not only integrating crucial principles of community generosity, building family ties and racial harmony, it must also consider pragmatic factors needed for inclusive housing such as financial planning, allocation and insurance. By planning for the future, the city's leaders can take an active role in adding heart to housing, ensuring that residents live in spaces characterized by vibrancy, self-sufficiency and connectivity.

3. MOBILITY IS A SHARED COMMUNITY EXPERIENCE.

Transportation determines much of the quality of life for residents in a smart city.

In Singapore, the Land Transit Authority (LTA) is building a system of transport infrastructure in which daily commutes can integrate active mobility modes like walking and cycling with public transportation services like mass rapid transit (MRT) and buses. The 'Walk Cycle Ride' initiative offers national benefits: it encourages more liveable recreation spaces, promotes sustainable energy use and reduces pollution. By applying advanced technologies to mobility, the city enables citizens to lead more active lifestyles through convenient and cost-effective transportation.

Transforming the ways in which citizens inhabit their cities by prioritizing health and mobility will, in turn, raise the growth potential of the world's cities.

Source: WEF

Photograph: Unsplash/Hu Chen

EU MEMBER STATES ADD MORE CLIMATE POLICIES

The EEA briefing 'More national climate policies expected, but how effective are the existing ones?' analyses EU Member States actions to reduce greenhouse gas emissions and achieve climate and energy targets.

According to the briefing, EU Member States report better and more complete information about their climate policies, including on their expected emission savings. However, reported evidence on the achieved emission cuts and costs of these policies is still insufficient.

EU Member States have reported 1 925 climate change mitigation policies and measures to the EEA. More than 400 of these policies are new since 2017, and are mostly at the planning stage, reflecting also the ongoing preparation of National Energy and Climate Plans. The EEA data shows that most EU Member States' climate policies are either economic instruments (44 %), such as subsidies or feed-in tariffs, or regulations (43 %), for example, on energy efficiency.

The reported policies primarily target energy-related greenhouse gas emissions, including by enhancing buildings' energy efficiency (18 %), deploying more renewable energy (16 %), switching to low carbon fuels or electric vehicles (8 %), or by improving vehicles' fuel efficiency (7 %). More than 10 % of the measures concern agriculture, including many of the new actions. In this sector, the EEA data shows that the most common objectives are reducing fertilizer or manure use on cropland and improving animal waste management.

The EEA estimated recently that the EU and its Member States have reduced their total greenhouse gas emissions by 23.2 % from 1990 to 2018. At the same time, Member States' projections are not yet in line with the target for 2030 of at least a 40 % reduction in GHG emissions. According to the EEA analysis, Member States' current policies can deliver only a 30 % reduction by 2030, while implementing all reported planned policies could bring the total reduction to 36 %.

Source: EEA

Photographs: (top right) Unsplash/Christian Wiediger; (bottom left) Unsplash/Juanma Clemente

COLOMBIA TO HOST 2020 WORLD ENVIRONMENT DAY ON BIODIVERSITY

On the eve of a critical year for environmental decision-making, Colombia, Germany and UN Environment Programme (UNEP) today announced that Colombia will host World Environment Day 2020 in partnership with Germany and that it will focus on biodiversity.

World Environment Day takes place every year on 5 June. It is is the United Nations' principal vehicle for encouraging worldwide awareness and action for the environment. Held annually since 1974, the Day has also become a vital platform for promoting progress on the environmental dimensions of the Sustainable Development Goals. With the United Nations Environment Programme (UNEP) at the helm, over 150 countries participate each year.

"2020 is a year for urgency, ambition and action to address the crisis facing nature; it is also an opportunity to more fully incorporate nature-based solutions into global climate action," said Inger Andersen, Executive Director of the UNEP. "Each year, World Environment Day is a powerful platform to accelerate, amplify and engage people, communities and governments around the world to take action on critical environmental challenges facing the planet. We are grateful to Colombia and Germany for demonstrating leadership in this effort."

According to a landmark report this year by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), current negative trends in biodiversity and ecosystems are projected to undermine progress towards 80 per cent of the assessed targets of the Sustainable Development Goals related to poverty, hunger, health, sustainable consumption and production, water, cities, climate, oceans and land.

Source: UNEP

NEW STANDARDS FOR AIR CONDITIONERS AND REFRIGERATORS SET TO TACKLE CLIMATE CHANGE

Growing demand for air conditioning units and refrigerators is threatening to accelerate global warming, but new guidelines could help reduce emissions by setting clear performance standards for new appliances.

The new model guidelines for room air conditioners and refrigerators provide a tool for developing and emerging economies on laws and policies requiring new appliances to be energy-efficient and use refrigerants with a lower global warming potential.

If ambitious efforts in line with the guidelines are pursued throughout Africa alone, the annual impacts by 2030 would result in savings of 40 terawatt hours of electricity—equivalent to the output of almost 20 large power plants and a cost of US$3.5 billion in electricity bills—and a reduction of 28 million tonnes of CO_2 emissions.

"We need to expand access to cooling, which is essential to many aspects of human life and the achievement of the Sustainable Development Goals," said Brian Holuj of the UN Environment Programme's United for Efficiency initiative (U4E), and one of the lead authors of the guidelines. "But we need also need to mitigate the energy and environmental impacts. The guidelines advise governments on how to do just that."

COOLING ON A GROWTH SPURT

Cooling is critical for human health, productivity, manufacturing, data centres and research. But the anticipated growth will accelerate climate change unless we change our approach.

Typical cooling units require electricity and a refrigerant gas to operate. When electricity comes from fossil fuel power plants—which is the case for nearly 75 per cent of the electricity in non-OECD countries—they emit greenhouse gases and air pollution.

Globally, an estimated 3.6 billion cooling appliances are in use today, and this is projected to increase to 9.5 billion appliances by 2050. If cooling is provided for all who need it in a warming world—and not just those who can currently afford it—this would require up to 14 billion cooling appliances by 2050.

Electricity consumption varies widely, but household refrigerating appliances in some unregulated markets have been found to consume over 1,000 kilowatt hours of electricity (kWh) per year, whereas some of the best consume around one fourth as much.

MINIMUM STANDARDS CAN MAKE REAL DIFFERENCE

Minimum energy performance standards and energy labels, if well-designed and implemented, are some of the fastest and most effective approaches to improve efficiency.

The problem is that while dozens of countries have minimum energy performance standards and energy labels, many are outdated or unenforced. Inadequate standards and labels leave countries vulnerable as dumping grounds for products that cannot be sold elsewhere.

By producing clear guidance, the guidelines can ensure that standards and labels are effective.

Aside from the energy profile, many refrigerants have a global warming potential that is well over 1,000 times as potent as carbon dioxide. Under the Kigali Amendment to the Montreal Protocol, countries will phase down hydrofluorocarbon refrigerants—one type of such climate-warming gases—by over 80 per cent over the next 30 years. According to the latest research, moving to best available cooling technologies would reduce cumulative emissions by 38–60 gigatonnes of CO_2 equivalent by 2030 and 130–260 gigatonnes of CO_2 equivalent by 2050.

The guidelines are another strand to a global movement to make cooling efficient and climate friendly. The Cool Coalition—a global network connecting over 80 partners—also works to expand access to cooling while reducing the climate impact.

Source: UNEP

Photographs: (top left) Unsplash/Chromatograph; (bottom right) Unsplash/Debby Hudson

Fotografije: Pixabay

PFAS POLLUTION IS WIDESPREAD IN EUROPE BUT RISKS ARE STILL POORLY UNDERSTOOD

The EEA briefing 'Emerging chemical risks in Europe – PFAS' presents an overview of the known and potential risks to human health and the environment in Europe posed by per- and polyfluorinated alkyl substances (PFAS). These extremely persistent and man-made chemicals are used in a variety of consumer products and industrial applications because of their unique properties, for example, to increase oil and water repellence, reduce surface tension, or resist high temperatures and chemicals. Currently more than 4 700 different PFAS exist, which, due to their extreme persistence, accumulate in people and the environment.

Although there is a lack of systematic mapping and monitoring of potentially polluted sites in Europe, national monitoring activities have detected PFAS in the environment across Europe, and the production and use of PFAS have also resulted in the contamination of drinking water supplies in several European countries. Human biomonitoring has also detected a range of PFAS in the blood of European citizens.

The EEA briefing warns that, due to the large number of PFAS, it is a difficult and time-consuming task to assess and manage risks for these substances individually, which may lead to widespread and irreversible pollution. The costs to society due to harm to human health and remediation in Europe have been estimated to be tens of billions of EUR annually. People are mainly exposed to PFAS through drinking water, food and food packaging, dust, creams and cosmetics, PFAS-coated textiles or other consumer products. Taking precautionary actions to limit non-essential uses and promoting the use of chemicals that are 'safe-and-circular-by-design' could help limit future pollution, the briefing notes.

The European Commission published its communication on the European Green Deal, which includes a zero pollution ambition for a toxic-free environment. The Commission's communication foresees a chemicals strategy for sustainability that "will both help to protect citizens and the environment better against hazardous chemicals and encourage innovation for the development of safe and sustainable alternatives.

Source: EEA

ANTARCTIC OZONE HOLE IS SMALLEST ON RECORD

In 2019, the hole that developed in the ozone layer over Antarctica was the smallest on record since the ozone hole was first discovered, according to scientists at NASA and the US National Oceanic and Atmospheric Administration.

In an average southern hemisphere spring, the hole expands throughout September and mid October to a maximum extent of about 21 million square kilometres. In 2019, the hole reached 16.4 million square kilometers on September 8, but then shrank to less than 10 million square kilometres for the remainder of September and the first half of October.

"It's great news for ozone in the Southern Hemisphere," said Paul Newman, chief scientist for Earth Sciences at NASA's Goddard Space Flight Center in Greenbelt, Maryland. "But it's important to recognize that what we're seeing this year is due to warmer stratospheric temperatures. It's not a sign that atmospheric ozone is suddenly on a fast track to recovery."

The long-term recovery of the ozone layer is underway but is still expected to take years, according to the 2018 quadrennial review from the Scientific Assessment Panel of the Montreal Protocol. Northern Hemisphere and mid-latitude ozone is projected to heal completely by the 2030s followed by the Southern Hemisphere in the 2050s and Antarctic by 2060, according to report.

An uncommon weather event—a sudden stratospheric warming—disrupted the circulation in the polar stratosphere in early September, just as the ozone hole was beginning to form. Warmth in the stratosphere reduces the formation of polar stratospheric clouds, which are a critical link in the chain of events that lead to the ozone hole.

This is the third time in the last 40 years that weather systems have caused warm temperatures that limit ozone depletion. Similar weather patterns in the Antarctic stratosphere in September 1988 and 2002 also produced atypically small ozone holes.

There is no identified connection between the occurrence of these unique patterns and changes in climate.

Source: WMO

Photographs: (top left) Unsplash/Louis Reed; (middle right) Unsplash/Derek Oyen

TO MAKE THINGS LAST LONGER AND CREATE LESS WASTE

Aleksandra Mladenovic,
Chairman of the organisation Ambassadors of sustainable development and environment and national coordinator of the International programme Eco-schools

"Circular economy as a part of the concept of society's sustainable development" is the project of the professional organisation Ambassadors of sustainable development and environment. The goal of this organisation is to inform the general public about the values of circular economy concept, along with the portrayal of prior experiences and good practise examples about how this concept has already been implemented in education centres in Serbia. As a result of this project, the review was provided about the situation in Serbia, and farther (through previous experiences in EU and worldwide, in terms of Sustainable development goals), also about the progress of circular economy concept, our position at the moment and possible direction of further development and options for participation. The project was supported by the Ministry of environmental protection through co-financing model for projects of a nongovernmental organisation.

Aleksandra Mladenovic, the chairman of the organisation and national coordinator of the International programme Eco-schools, says that in the course of the programme, from July till November 2019, and having in mind the fact that Serbia has only scratched the surface of circular economy, it was necessary to examine the possibilities and legal frame, find the best practice examples and make the public familiar with them, allowing for follow-up on further development.

The concept of circular economy encompasses industrial production, which is based upon renewability of the materials, renewable energy sources implementation, reduction and/or elimination of chemicals usage, minimising waste generation, product design which will allow longer life cycle etc. The value-added product stands on "staying" longer in use and not making waste.

The transition to a circular economy requires changes in the entire life cycle of a product and product design. Thus, new business and trade model is needed, as much as an improved way of turning waste into resources and different consumers' attitude, etc. Furthermore, it is necessary to change and innovate the system: in technology, organisations, society, financing procedures and policies,

Photographs: (top) Unsplash/Bernard Hermant; (all others) courtesy of Aleksandra Mladenovic

which are only a few of the starting points required for the transition process from linear to a circular economy.

During the implementation of the project "Circular economy as a part of the concept of society's sustainable development", the major stakeholders were determined, whose role in the development of the circular economy concept in Serbia is conspicuous, particularly about to entrepreneurial initiatives of the education centres, women and youth. Also, the consultations were organized with the prominent representatives from the sectors of industry, science, state and local governments and non-governmental organisations, who already have experience in the implementation of the circular economy concept in Serbia. At the same time, the general public had a chance to get familiar with the accomplishments in the circular economy, through the publication designed for the school kids and public appearances of teachers and local governments' representatives.

"Two years ago, when we first mentioned to the Eco-school coordinators that what they do within their institutions, through the course of lectures, but especially through afterschool activities, has great importance and that they might help development and 'testing' of circular economy

in practice, they were surprised and slightly confounded. In the beginning, they weren't sure what term 'circular in economy' generally means and how they could implement basic ideas about that same 'circular economy' into their regular curriculum", Aleksandra explained how the first encounter of the project participants with a new concept had gone through.

However, it wasn't much of an obstacle to the members of the "Ambassador of sustainable development and environment" team. They started with a series of lectures and numerous practical activities, which at last concluded with an expert conference "Principles of circular economy in the environmental protection" that is accredited by the Ministry of education, science and technological development. The conference was held in October 2019, in partnership with local communities of Cajetina, their tourist organisation, Eco-schools "Dimitrije Tucovic" from Cajetina and "Milivoje Borovic" from Mackat. Aleksandra says that they are particularly pleased as they managed to introduce the circular economy, at least for the time being, as a way of thinking and guidelines for future activities, into the Eco-schools and local communities.

"In those communities, people have already changed their attitudes, and they look at materials, products, waste, production process etc. in a different way. They spread further the idea of the circular economy. This way new approach to resources and items has come out of the Eco-schools and entered the homes, institutions and around the local communities", proudly points out Aleksandra.

The document "Circular economy in Serbia: the process started (2019)" shows precisely where the development of the circular economy concept stands at the moment, which encompasses advantages, obstacles, downsides, possible solutions for overcoming problems etc. The document alone has importance as a unique review on progress and further ways of staying involved in.

"Besides this 'serious' document, we made a booklet for children and youngsters, with imaginative illustration and original texts. We distributed the booklets throughout the Eco-schools in Serbia so that youngsters can learn and apply basic values of this concept since the circular economy is explained in pictorial and appropriate to their age manner", Aleksandra said. All publication will be available on the website of the "Ambassadors of sustainable development and environment https://ambassadors-evn.com/

The team of the organisation "Ambassadors of sustainable development" keeps track of the progress of circular economy and climate changes not only in Serbia but in the region too, as the partners on the regional project, financed by EU, named "ENV.net factoring the environmental portfolio for the Western Balkans and Turkey in the EU Policy Agenda" (ref.no. 2017/394-372). Meanwhile, they expect that Eco-schools, as a never-ceasing source of good examples and substantial activities, will approach with suggestion and ideas about how to reuse an old textile, recycle secondary raw materials or extend the life cycle of objects and appliances. We are surely going to report on that in the future too!

Prepared by: Tamara Zjacic

The Republic of Serbia The Ministry of Environmental Protection

"The views and opinions expressed in this publication are solely the responsibility of the author and his associates and do not necessarily represent the official view of the Ministry of environmental protection."

The Env.Net project is funded by the European Union. The views expressed in this document do not necessarily reflect the views of the European Commission.

SCIENCE IS THE TRUE DRIVING FORCE OF TECHNOLOGY

It may not matter much to one navigation user on a mobile phone what happens to the electrons in the phone chip after touching the screen. However, for an engineer-researcher, things are a little different. He carefully watches electrons transformed into photons and their cruise through the antenna to the base station and then through the optical cables to the server.

To advance and develop a new solution, the innovator must understand the basics, confirms Marko Krstic PhD, Director at the Centre for the Promotion of Science where many researchers have had opportunities to tackle the challenges of developing new technology. It is often necessary to facilitate the mastery of scientific facts through various interesting activities, projects and manifestations, and this is how the Centre for the Promotion of Science serves to achieve the most essential thing – integrating science into social flows.

Photographs: CPN

MARKO KRSTIC PhD, was born in 1984 in Nis. He graduated from the Faculty of Electrical Engineering at the University of Belgrade in 2007, and at the same faculty in 2016 earned a PhD in Electrical Engineering and Computer Science. His fields of interest are quantum electronics and photonics.

Since 2009 he has been employed at the Faculty of Electrical Engineering, the University of Belgrade at the Department of Microelectronics and Technical Physics, where he was first hired as a teaching assistant, then Assistant, and from 2016 Assistant Professor. During his career, he was involved in teaching a total of 15 courses and was involved in starting two new courses and reforming one course. Among the most significant courses that he took part in is the Special Group in Physics, a course in advanced physics for students in the first year of basic studies at the Faculty of Electrical Engineering.

EP ***What is the most crucial goal of the Centre for the Promotion of Science?***

Marko Krstic The mission, and at the same time, the most important goal of the Centre for the Promotion of Science represents a constant in the work of this institution for many years, which is to bridge the gap between science and society by bringing all relevant stakeholders and the general public into the process of research and innovation. The ultimate goal is to integrate society into this process, which provides better insight into the needs of citizens and the opportunity for science to more adequately address societal challenges. In other words, the mission of the Centre for the Promotion of Science is to find a place for science in the wider society, to disseminate the scientific method as the basis of systematic and critical thinking, to promote its useful value in building value based on knowledge and, ultimately, to raise general scientific literacy.

EP ***How interested are young people in science and technology in the modern age, and how can we bring them even closer together?***

Marko Krstic Technology is all around us today, providing new, unimaginable opportunities on a daily basis. Science, of course, is hidden behind technology as its driver, but it is far more difficult to unveil science as directly as technology. Therefore, the fascination with technology is understandable and inevitable. Today it gives us the opportunity to easily, with a mere click of a button, often immediately, get information about anything that interests us at that moment, to connect with a person thousands of miles away in seconds, to experience virtual reality through special glasses, to get navigation from any location on the planet to the desired destination ... There is no doubt that technological literacy is today an imperative of the society based on it. Still, I firmly believe that the foundations on which this same technology is based should not be neglected.

In the world of "sweet temptations" provided by modern technology, it is not easy to interest the youngest in reflecting on these foundations and presenting their importance. That is why the Centre for the Promotion of Science actively participates in and implements several European projects, such as Scientix, the STEM School Label, which promote the so-called STEM (Science Technology Engineering Mathematics) education. It should contribute to raising the awareness of the importance of these disciplines, increasing students' interest in the subjects in this group through the development of teaching methods, precisely by using modern technologies, which are becoming effective learning tools and a powerful tool to bring students closer to abstract concepts of science. Thanks to the aforementioned projects, the Centre has formed a network of STEM teachers in Serbia and is proud of the results that have become noticeable even beyond the borders of Serbia.

EP ***Which of your projects were the most interesting to your visitors?***

Marko Krstic The most visible "project" of the Centre that constantly reaches the largest number of people is our popular science magazine "Elements", which is published quarterly, with a circulation of about 3,500 copies per issue. Whether it is astronomy, biology, philosophy, mathematics, physics, art, politics or economics, original stories told from different points of view await you on our pages. So, for example, you will read in Elements about the personal adventures of astrophysicists searching for black holes and distant galaxies, as well as for medieval robots, transmitting bacteria in the kitchen, or about the long-hidden but incredibly intertwined paths of science and slavery ... Our team that prepares the "Elements" is made up of young and old

THE CENTRE FOR THE PROMOTION OF SCIENCE

The Centre for the Promotion of Science (CPN) is a public institution established in 2010 by the Ministry of Science of Serbia, with the task of promoting science and technology. They carry out activities and programs in cooperation with research and educational institutions in the country and in the world, cooperating with ministries, the media, as well as the private sector.

and experienced science journalists, authors, researchers, essayists and science promoters.

In addition to the magazine, there are major events such as the "May, Month of Mathematics" when every year we pay attention to maths and related sciences through a large number of lectures, panels, workshops, as well as Art & Science, a program sponsored by a major European project through which we connect scientists and artists, with the idea of complementing the creative artistic process with a scientific method, supporting the use of advanced technologies in the process of authentic creative process. A public call from the Centre for the Promotion of Science is also inevitable, through which we fund science promotion and popularisation projects in Serbia, support for the construction of science parks – interactive outdoor classrooms, a large number of children's workshops and camps.

Finally, there is our Makers Space, an open lab for all creative people looking for a place to realise their ideas. As part of the Science Club of Belgrade, on more than 130 square meters of space, Maker Space members have the technical material, tools, workspace, computers, professional help and advice from colleagues with whom they can develop their projects – from ideas to finished prototypes. I sincerely hope that some of the innovations of the members of our Makers Space will soon see the light of day! I invite, of course, everyone interested to explore more about the activities and programs of the Center on our website www.cpn.rs

EP ***Who are the participants and visitors to your workshops, lectures and exhibitions?***

Marko Krstic The range of activities of the Centre for the Promotion of Science is very wide and involves all age groups – from preschool children, through elementary students, high school students, students to teachers and researchers. The Centre also has accredited seminars for teachers and researchers in its portfolio and works closely with research institutions. One thing is for sure, though. To my great pleasure, the curiosity of our youngest participants in the activity is endless.

EP ***To what extent did the organization of the Science Festival and Researchers' Night, as well as other activities of the Center, contribute to the popularisation of science among the younger population?***

Marko Krstic I would very much like to see that everything we are working on has an adequate echo among the young. I consider the education of young people, as an enormous, but also a very important and noble obligation, both in my job at the faculty and at the Centre for the Promotion of Science. As a perfectionist by nature, I think it is always possible and necessary to go a step further, but the existing results, as well as a significantly higher number of participants in our activities and projects, encourage us not to give up the path we took. Here is a small example that supports this. The Intellectual Property Office of the Republic of Serbia awards annually through the competition the World Intellectual Property Organisation (WIPO) awards, among other things, for the best retrieval of high school students. In the last two or three years, there has been a trend of increasing number of applications for inventions of high school students, and as part of the competition extraordinary projects are submitted that far exceed the level of high school, and it becomes more and more difficult to declare a winner in such a huge and fierce competition. This information really makes me happy, because it shows a trend that the popularity of science is growing. I want to believe that activities such as the Science Festival, Researcher's Night, and the like, will be the inspiration for such ventures by our young talents.

"I would very much like to see that everything we are working on has an adequate echo among the young.

I consider the education of young people, as an enormous, but also a very important and noble obligation, both in my job at the faculty and at the Centre for the Promotion of Science"

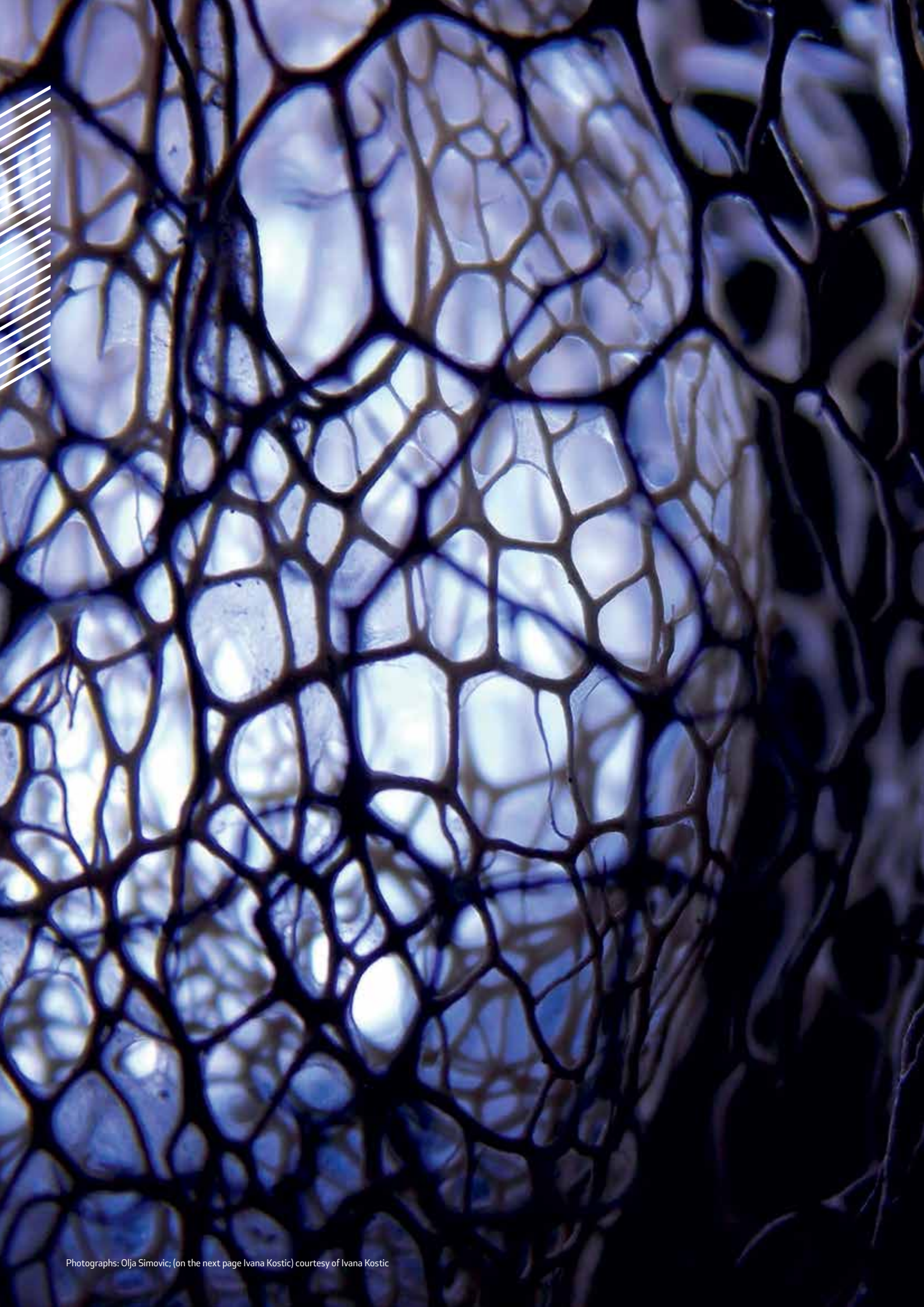
EP ***How important is the problem of climate change and environmental issues in your programs?***

Marko Krstic The issue of climate change is very important, which is why it needs to high on our agenda at all times. At this point, I am pleased to say that the Centre for the Promotion of Science is a part of a major European project under the umbrella of Horizon 2020 calls, under the acronym TeRRIFICA, which deals with climate change, as well as methods for adaptation and prevention of climate change.

The aim of the TeRRIFICA project is to comprehensively integrate data, research and activities in order to prepare a general cross-section of the climate-related situation in the mapped parts of Europe (Germany, Poland, France, Belarus, Spain, Serbia). Various approaches involving the widest range of citizens, local activists, researchers, decision-makers and other engaged individuals should provide comprehensive guidance to combat climate change further, adapt to changing circumstances and anticipate future developments. This project, in addition to its immensely important topics, is the largest European project to date, in which the Centre for the Promotion of Science is involved.

The Centre for the Promotion of Science is a regional project centre and the coordinator of activities in several Southeast European countries – from Croatia to Romania, and from Albania to Hungary. In the countries of our region, in cooperation with local partners, primarily research and education centres, state institutions and non-governmental organisations, the Centre will organise numerous meetings, workshops and seminars, first to define the working framework of the TeRRIFICA project, and then to test the proposed models and solutions in practice.

Interview by: Jelena Cvetic



Photographs: Olja Simovic; (on the next page Ivana Kostic) courtesy of Ivana Kostic

INNOVATIVE SUSTAINABLE SOLUTIONS

IVANA KOSTIĆ, PhD, is a co-founder of Health Tech Lab (HTL), a local health technology ecosystem, founded to create and support innovation in this area in Serbia and beyond. HTL was created after the organisation of the First Medical Hackathon of the Massachusetts Institute of Technology (MIT) in Belgrade, in collaboration with MIT hacking medicine. She is also the Technology Transfer Associate at the Innovation Fund and an alumna of the Israel International Development Cooperation Agency (MASHAV).

Ivana earned her PhD degree from the MIT Portugal Program – Bioengineering Systems, in cooperation with Portugal laboratories Biomaterials & Stem Cell-based Therapeutics Lab and Karp Lab at MIT together with Brigham and Women's Hospital and Boston's Children Hospital. These joint efforts were oriented towards developing minimally invasive and more effective therapies for ischemic organs. The collaboration is still ongoing.

Physiology studies sparked her initial interest in this area at the University of Belgrade and an additional rich practical knowledge gained through the IAESTE internship in Brazil and the First BSRT Summer School of Regenerative Medicine in Berlin, 2009.

Ivana is the Technology Transfer Associate at the Innovation Fund.

Ecology and environmental conservation are known as one of the fields of science and life. However, climate change and awareness of the consequences of human activities indicate the growing need to intensify the principle of sustainability in all the fields.

Innovations are an effective mechanism for creating solutions for many challenges. Support to innovation makes it possible to meet the challenges both at local and global level, and the Innovation Fund of the Republic of Serbia (the Fund) has been doing that since 2011 in cooperation with the World Bank and the European Union.

Among many projects applying for the innovation support implemented by the Fund, there is a significant number of those coming precisely from the field of energy efficiency and environmental protection. Nine per cent of the total number of funded projects come from energy efficiency, and it is the fifth area in terms of incidence, after projects in the field of information and communication technologies, agriculture and food, machinery and mechanical engineering and software development. Environmental projects account for 3 per cent and are ranked ninth. The trend of applied and funded projects in these areas has been increasing over the years.

It is important to note that the Fund does not allocate funding based on priority or preferential areas and that there is no sectoral focus. On the other hand, an essential factor is the monitoring of the number of applications and the number of projects financed in each area, to identify trends and channel finances through future targeted calls and new programs.

The Technology Transfer Office has been operating within the Fund since 2016 and successfully cooperates with the Serbian academic society, supporting scientific innovations and scientific research. The development of several sustainable technologies has been supported through The Technology Transfer program and The Innovation Voucher program. The idea is to continue the trend through the new program – The Proof of Concept program.

Examples of Supported Projects

The new catalyst for the dehalogenation of freon comes from the Innovation Centre of the Faculty of Technology and Metallurgy in Belgrade. It aims at the more efficient elimination of freon from the environment. Freons are known to be released from cooling systems, fire extin-

guishing systems and polyurethane foams for thermal insulation, thereby damaging the ozone layer. The innovative catalyst provides 95.5 per cent efficiency.

Dr. Knight is a spin-off project (created as a by-product of the main project, editorial note), originating from the Faculty of Technology and Metallurgy in Belgrade, dealing with the production of multifunctional colour catcher laundry balls. This technology is patented, and the balls have a dual function: in addition to removing colours quickly, to prevent the transition from one fabric to another, they also serve as a fabric and water softener and can be reused. First of all, they are biodegradable and produced in an energy-efficient manner.

In addition to academic society, the Fund has successfully financed the innovations of micro, small and medium-sized enterprises since its inception. Solagro is one of those projects. It deals with developing a new model of smart press for can recycling. They stand out for the most technically advanced smart press mechanism that reduces waste volume by 90 per cent compared to the initial state, providing a better user experience with an attractive design in comparison to other existing mechanisms. The Fund funded this start-up through the Early Development Program for a year, after which the device was ready for use. This press has been installed in more than 150 locations in 9 countries worldwide, and the company has collaborated with more than 30 clients, including global brands Ball packaging, Coca-Cola, Molson Coors and others. Through its innovative approach and attractive packaging, Solagro achieves its goal of motivating people to recycle.

In the cooperation with the Finnish Embassy, the Fund has organised four local competitions for Slush start-ups. Local winners had the opportunity to take part in global competition and participate in the Slush conference in Finland. The fourth competition in 2018 was the topic of sustainable innovation where more than 25 start-ups from Serbia applied, 11 of which were shortlisted. All of them have developed or are still developing solutions in the field of sustainable, green innovation, including energy efficiency and environmental protection.

By the decision of Finnish experts in Serbia, the start-up Box System was the winner of the local Slush competition in 2018. Box System designed eco-friendly food transport boxes that require specific temperature conditions called

Photographs: Solagro

WooBox. The boxes are made of wood and wool as a natural alternative to expanded polystyrene foam. This team strives to become an important link in the circular economy chain in the global market and thus contribute to the sustainable future of our planet.

Further Development of Innovations

The question is what to do next and where to direct the focus of start-ups and new scientific research so that the field of sustainability would make sense. Numerous technologies drive innovation, but the question is, how do new technologies themselves affect sustainability? It is also one of the topics that Health Tech Lab (HTL) deals with and will continue dealing with. HTL enables the formation

and development of innovations in the health technology ecosystem as well as the digitization of healthcare in a sustainable way. It cooperates with start-ups such as AlgiOx – a start-up that has created a smart indoor air purification system to prevent a number of health issues, and the system also produces oxygen. The Energy Portal also wrote about HTL's work related to sustainability.

Digitization is one of the priorities for all governments as it contributes to the quality of life through economic growth, productivity gains and employment rates. However, data centres also contribute significantly to emissions due to high energy consumption and often inappropriate cooling systems, consuming up to 2 per cent of global electricity,

Photograph: AlgiOx

Digitization is one of the priorities for all governments as it contributes to the quality of life through economic growth, productivity gains and employment rates

with a growth rate of 12 per cent annually. Additionally, the typical life span of a device is about 2 to 3 years, and there is intense energy consumption to design, assemble, pack and deliver these devices to consumers worldwide. It all affects the increase of e-waste, including all household appliances.

When the electronics are not recycled appropriately, the raw materials in them release toxic chemicals into the ground and therefore into our food. Compared to conventional municipal waste, certain components of electrical products contain toxic substances that can create threats to the environment as well as to human health (increased risk of cancer and neurologic disease). For examples, television and computer monitors typically contain hazardous materials such as lead, mercury and cadmium, while nickel, beryllium and zinc are often present in switchboards.

After all, Solutions Must Exist

We should think about them on time. Currently, a pre-acceleration program called Danube Energy + is being developed in Serbia, where the Innovation Fund is one of the organisations that participated in the preparation of the program itself. The program is geared towards ideas at the early stages of development in the Danube region (Germany, Bulgaria, Slovakia, Slovenia, Croatia, Czech Republic, Romania, Serbia and Ukraine). It provides mentoring, funding and other means of support to these ideas. Applications are opening for the first time in December this year.

Some of the other approaches and solutions that require the collaboration of all members of the innovative ecosystem may include:

- Increase in the number of public calls by funds and companies to create innovative products and processes in the areas of green, sustainable digitization;
- Education for Circular Economy;
- Redesign of new devices that would be sustainable;
- Thinking about innovative ways to manufacture devices, for example, Fairphone
- Thinking about alternative energy sources for new appliances;
- E-waste management;
- ormal and non-formal education in this field;
- Improving regulations in this area.

Ivana Kostic

ALL FOR ONE, **CEEFOR** FOR ALL

When you want to eat a cake and have no desire to make it by yourself, you go to a pastry shop. In case you get pinched nerve at work, you will schedule a visit to a massage therapist. If you need a new pair of snickers for jogging, you will go to the sports stores. If you decide to improve the sustainability and energy efficiency of your facilities, you will contact the engineers of the Centre for Sustainable Development and Energy Efficiency – CEEFOR

The company **CEEFOR** was founded in 2010 in Belgrade. At their disposal, customers have a diverse team of more than 20 professionals with many years of work experience - from mechanical, electrical and civil engineers, through technology engineers, architecture, traffic and fire protection, to economic and financial experts, translators and philologists.

By completing tasks in the field of energy technologies, **CEEFOR** reduced not only its customers costs but also emissions of harmful substances and gases, making the company one of the domestic economic elites pursuing social responsibility.

In addition to the two obvious fields of activity, sustainable development and energy efficiency, the company also offers consulting and design services in the field of renewable energy, in which its contribution to reducing the carbon footprint is particularly prominent.

By designing solar power plants, wind power plants, biogas power plants and hydropower plants, **CEEFOR** has "enriched" the energy mix of Serbia and the region with more than 100 pure megawatts and has positioned itself as a forerunner of the fossil fuel phase out in our market and an innovator.

Energy-efficient solutions, whose implementation was contributed by a group of **CEEFOR** employees, include two 2 MW solar power plants in Kladovo and a solar power

Photograph: Pixabay

plant on the roof of the IKEA department store in Belgrade.

The team of engineers also worked on the investment-technical documentation for a 9.9 MW solar power plant for the Electric Power Industry of Serbia as well as for a wind farm in Kostolac with a total installed capacity of 66 MW was also designed. Kostolac windmills are expected to supply about 30,000 Serbian households.

The Petroleum Industry of Serbia also hired **CEEFOR** and one of the projects implemented for the period from 2013 to 2015 was the design, obtaining permits and technical inspection of cogeneration and gas power plant in the municipalities of Kanjiza, Srbobran and Veliko Gradiste.

Photographs: CEEFOR

They provided a multinational corporation from France, Suez, focused on operations in water, electricity, natural gas and waste management sectors, with the preliminary design, the conceptual design, and the project for building permit for a landfill gas power plant in Vinca.

On top of that, the company is an authorized consultant for the Green for Growth Fund and ProCredit Bank, the first domestic user to be guaranteed the "renewable" origin of the consumed electricity by the Electric Power Industry of Serbia. Part of the energy needs will be potentially met from biogas plants with cogenerations from Stara Pazova (600 kW), Sombor (999 kW) and Cestereg (600 kW), whose designing also involved **CEEFOR** employees.

Whether you hire a company as a reliable consultant for energy efficiency and the use of renewable energy sources, or as a direct partner in the design of studies, projects and project documentation, you can count on the dedicated work of employees to find a practical and long-lasting solution adjusted to your requirements and capabilities.

When you put your trust in the expert hands of specialists, there is no need to worry that it could be abused, only that your expectations will be exceeded. The list of **CEEFOR** 's current clients is long, and, in the future, you can enrol in it.

Prepared by: Jelena Kozbasic

CEEFOR
ENERGY EFFICIENT SOLUTION

CEEFOR Ltd.
103 Bulevar Oslobodjenja, Belgrade
W | www.ceefor.co.rs
M | info@ceefor.co.rs
P | 011 40 63 160

HOW TO GROW AIR?

Recognizing that their fellow citizens have moved too far away from nature due to lack of time and money and with the desire to bring nature directly into their four walls, five students from Serbia have joined thinking about it, and that's how AlgiOx was born.

David Vucen, Ivana Stankov, Ivan Citakovic, Mina Hasanovic and Jovan Jovanovic met in February during the ParkUp! competition at the Science and Technology Park in Belgrade. For five days, they were intensively developing their initial idea, and their effort was wreathed in victory and the opportunity to present a new means of combating air pollution. According to them, AlgiOx is smart, self-sustaining air generator that uses the power of microalgae to produce oxygen and remove harmful particles and gases from the air.

The general public has recognized the importance of this innovation, so the newspapers published stories about Serbian youth who cleans the air with the help of microalgae. Readers received this news with enthusiasm and pride. "Our device works according to the natural principle of photosynthesis", explained Ivana Stankov, reminding us of the basics of biology - microalgae produce oxygen that we breathe while absorbing carbon dioxide that we release when breathing.

Photograph: Unsplash/Rodion Kutsaev

Photograph: AlgiOx

SOMETHING ABOUT EVERYONE

Despite having a common enemy - polluted air, the members of the AlgiOx team are professionally oriented in different ways and attend VARIOUS/DIFFERENT faculties. "It helps us a lot in making decisions and solving problems because we are looking from multiple perspectives. It is interesting and challenging to work with people who are completely different", Ivana told us about the benefits of working in a diverse team, and we tried to find out what else distinguishes them, apart from the invention.

DAVID VUCEN Future medical biochemist. David is a member of the NGO Health Tech Lab that supports and promotes healthcare start-ups.

IVANA STANKOV In addition to her student responsibilities at the Faculty of Technology and Metallurgy and working at the AlgiOx start-up, Ivana volunteers in many organizations. She is a member of the student parliament and a project coordinator within which she works to develop the career of students at her faculty. She is an advocate of a healthy lifestyle and practices Latin dance.

IVAN CITAKOVIC Student of the Molecular Biology at the Faculty of Biology. Ivan is interested in biotechnology and in his free time likes to hike and scuba dive. He finds peace spending time in nature from an early age.

MINA HASANOVIC She has a bachelor's degree in Information systems and Technologies at the Faculty of Organizational Sciences. Mina's main area of interest is programming, but she is also attracted to arts management, ecology, marketing and human rights.

JOVAN JOVANOVIC Mina's colleague by vocation. Jovan prefers hardware but he mostly into software right now. He visits IT conferences, hackathons, and makeathons.

AlgiOx is better than other air generators on the market because it is more than that. It makes something we all need – air. Ivana told us about one more advantage compared to the other commercial devices. "Thanks to the mobile app, users could connect with their device and check the air quality and other parameters in their home anytime they like", Ivana discovered us.

The team, however, thinks they can still improve their invention. According to Ivana, the size of AlgiOx device could be a problem, because people got used to the small appliances, but the team is already working on it.

At the end of the year, they will test the air generator in real conditions. About ten chosen candidates will have the opportunity to try the AlgiOx in their homes. "We incorporated in this device all the assumptions about possible criticism, and now we want to check them", said our interlocutor and added that they have high expectations.

Although robust at first glance, AlgiOx is not an overly energy-consuming appliance. "The invention is very green and consumes up to 50 watts of electricity per hour which is less than the average light bulb - in case it works 24/7 at maximum load, which generally does not happen. It uses the sun as one of its primary energy sources, while in other situations it draws less than 25 watts per hour. This is almost the same as a phone charger", Ivana pointed out.

In several competitions, the team has ranked among the best start-ups, and each of the competitions brought them one step closer to realising the project. "AlgiOx has received a lot of support from the community, and that makes us very happy! We are glad that people recognize our vision of a healthier environment and a better life for future generations", said the representative of the innovators' team. Given that mass production is essential for the development of every start-up, AlgiOx is looking for an investor who will understand its value and hopes to hit the market in the third quarter of the next year. To this end, they will apply for various funds next year, including the Innovation Fund.

Except in households, these young inventors imagine that AlgiOx will also be used in kindergartens and schools someday, where our young generations spend most of the time.

In the future, they are to certify the safety of AlgiOx device and they are getting ready to participate in competitions and programs to help them grow their business. They are also planning a crowdfunding campaign. "It would mean the help of individuals who have experience in designing", Ivana told us. Also, an industrial designer would be an important reinforcement for them.

The money they received in 2019 from the City of Belgrade will be invested in renting a workspace where they will work on improving the device and educating team members.

Ivana, on behalf of the whole team, invited us to grow air. We will respond to her call. How about you?

Prepared by: Jelena Kozbasic

.

Photograph: AlgiOx

WASTE GLASS IN A WHOLE NEW BALLGAME

Recycling raw materials mostly have limited use, especially when it comes to glass. Although it is generally thought that new glass products, which are of the same structure (such as jars, bottles, cups, etc.) are obtained from waste glass packaging, it is widely known in the scientific community that the range of application is much wider. At the Faculty of Technical Sciences in Novi Sad, within the framework of the doctorate with a very clear title "Model of the use of waste glass packaging as secondary raw material in the production of clay blocks" whose author is Zorica Mirosavljevic PhD, is precisely about the new application. Motivated by years of work on waste management, which goes back to the time when she was just a kid, Zorica decided to turn her enthusiasm into science.

EP ***In Europe, whose trends we are striving to adopt, glass is treated as a recycling raw material in a closed cycle – we get glass packaging products from recycled glass. Various financial instruments stimulate recycling. What is the case with such practice in Serbia?***

Zorica Mirosavljevic The amount of glass has increased significantly over the last 20 years. Changing lifestyles and habits came with new age and integration into the consu-

Most glass packaging is intermixed when it comes to different colours, so it is difficult to recycle and reuse it for the production of glass packaging

Photographs: (top) Unsplash/Sierra Bell; (all others) Zorica Mirosavljevic

mer society. Few people think about reusing packaging, as our grandmothers and mothers used to do when preparing winter stores. We buy, consume and discard, and therefore the amount of waste increases. And that's why we think about recycling intensely.

In particular, 85 per cent of glass in municipal waste is made up of glass packaging, and when it comes to recycling, that is the exact glass packaging that we have in mind. Of all types of glass, glass packaging is the most important during the management of municipal waste, and only glass packaging can be recycled by re-melting to obtain new glass packaging. This circular recycling process is fantastic because it saves on raw materials and energy by as much as 80 per cent than producing new glass packaging using only natural raw materials. In practice, unfortunately, due to the inadequate level of separation of glass packaging from municipal waste, it is difficult to come up with some more representative quantities that can be handled. Most glass packaging is intermixed when it comes to different colours of glass (white, brown, green), so it is difficult to recycle and reuse it for the production of glass packaging. The reason is that the melting temperature of the glass varies depending on the colour of the glass. Sorting the glass by colour further complicates the process, and it is necessary to have a developed system for collecting glass packaging, so in developing countries, therefore, most of the glass packaging most often end up in the landfill. That is why, according to European-level statistics, Serbia is in a very low place in terms of how much it recycles glass packaging and how it complies with European directives.

In Serbia, on the other hand, the low recycling rate for glass packing is primarily due to the low purchase price of glass, the high cost of collecting and transporting waste glass packaging and the very high cost of sorting glass by colour, which is necessary in order to use it as a secondary raw material in the production of new glass packaging. From an environmental point of view, this represents the best possible management option for glass packaging. As glass generally has high chemical and thermal stability, its degradation at landfills is negligible, which in turn creates a major problem at landfills. Technology that would provide a higher level of separation costs a lot, and there is no financial incentive in the form of subsidies or the form of waste disposal fees. The increasing amount of that glass in landfills is a consequence of this policy.

EP ***What is the model of the use of waste glass that you worked on as a part of your scientific work?***

Zorica Mirosavljevic When Profesor Dragana Strbac PhD, my PhD mentor, and I decided to start finding alternative uses of waste glass, we first collected a certain amount of packaging and ground it to characterize the material. At the same time, we concluded that in brickworks across Serbia, there is a problem with the quality of clay used as a raw material for making construction products. If the amount of moisture in the raw material used in the production of ceramic products is increased, a large amount of energy is consumed to make a product that satisfies the market.

The experiment was set up to find a solution to these two problems, and we soon came to interesting conclusions. A detailed analysis of the current situation revealed that by adding glass and homogenizing a mixture of clay, we obtain a product that is better, more durable and with less moisture than the primary product. Both clay and glass contain a large amount of quartz which can be used. Increasing quality is just one of the positive factors in this process of obtaining a construction product. Of course, energy savings have been generated during this process. It is achieved by lowering the drying and baking temperature of the final product, which is made up of a mixture that is saturated with waste glass recyclate to some extent.

EP ***The first analyses were carried out as part of the project "Using Waste Glass Packaging from the Landfill in Novi Sad as a Secondary Raw Material for Brick Production" which was approved at the provincial level, and later the continuation of the research is carried out as part of your doctoral dissertation. How far have you come now when everything has taken on a practical dimension?***

Zorica Mirosavljevic For everything to make sense, it was necessary to present the project as technologically and industrially possible. Therefore, it was required to comply with some of the following conditions. When making clay blocks, we wanted to simulate the conditions that take place while obtaining construction products in brickworks. Firstly, the temperature range of the process was defined. The glass does not melt below 800 °C, and the baking of ceramic products usually takes place above 1000 °C, depending on the quality of the input raw material – clay. After that, we began to determine the size of the glass beads that are most suitable for mixing. The optimum size was below 0.71 microns. The next

item was to determine the percentage of mass fraction of glass powder in the clay mixture. According to scientific papers published abroad, we reach a range of 0 to 20 per cent, while within our study, the range was expanded to 30 per cent by weight of glass powder, to see what is the most suitable composition of the mixture by checking the properties of the obtained experimental samples that would meet market standards. The first results are in favour of increasing the strength and reducing the moisture of the resulting product. According to the final estimates, the material has been obtained whose service life has been extended by more than 25 per cent. The part we should be practically working on, perhaps in the next project, is to reduce energy consumption. The brickworks in which we did the experiments reduced their temperature production process to 880 °C, due to the quality of the clay, so we could not overly influence the energy aspect here. According to scientific papers from the UK, it is estimated that up to 20 per cent of energy savings can be achieved, depending on the mass fraction of glass. It is up to us to check this in practice when the conditions allow us.

EP ***Any project of this kind must have a certain positive economic dimension to be successful in the market. What can be concluded about this? What can be concluded about this?***

Zorica Mirosavljevic A minor economic analysis was done as part of a PhD dissertation. Our goal was to conduct some form of a feasibility study, covering first the city of Novi Sad and the municipalities in the immediate vicinity. It is estimated that there are around 9,000 tonnes of deposited glass per year in this region. It was also desirable that later parts of the research concerning the application in the brickworks take place at a location closer to the city itself. Unfortunately, positive feedback and enormous cooperation were achieved with the brickworks in Zrenjanin and the brickworks in Becej, which complicated the logistics model a little. Certainly, transport was also included in the economic model in addition to energy, capital, material and labour costs, and we wanted to calculate the ratio of the final cost of producing one kilogram of ordinary block to producing one kilogram of block with 30 per cent of mass fraction of glass recyclate which proved to be the best product.

The economic analysis results in the fact that without the mentioned waste disposal fee, it is logical and cost-effective to produce a block with ordinary clay, while with the implemented tax of at least 15 to 20 euros per tonne of waste glass, as an economic instrument, it is more favourable to produce a block with a mixture of clay and glass recyclate.

EP ***It is clear that there are many environmental benefits of reducing waste glass when it is separated and removed from landfills. What are the effects of the final product of your experiment on environmental aspects?***

Zorica Mirosavljevic Using the LCA software (Life Cycle Assessment), we performed an environmental impact analysis of the production of our product and an ordinary block. All factors such as transportation, fuel consumption in brickworks and production technologies used are calculated into the analysis, and we concluded that the transport is the deciding factor with a noticeable percentage of environmental impact reduction. So, the best application with the least environmental impact would be to reduce the gap between the landfill and the brickworks by establishing an effective local waste management model.

EP ***What are your plans and hopes concerning this usage of recycling glass***

Zorica Mirosavljevic For such and similar projects, whose goal is to make our planet cleaner, to come to fruition as a practical solution, it is important that those who can provide structural support legally, financially and logistically, are willing to hear. It is up to us to contribute to further work on improving and expanding the process.

Zorica Mirosavljevic PhD, continues her research at the Faculty of Technical Sciences, as an assistant at the Department of Environmental Engineering and Occupational Safety, within the Department of Environmental Engineering. She does her best to motivate young professionals to follow in her footsteps and work on the solutions which will be indispensable if we want to save the planet.

Interview by: Mladen Rajic

WASTE-TO-FUEL

Our people usually dispose of garbage without much thought. Rarely does a man feel guilty about dropping a banana peel, an old T-shirt or a light bulb directly into the bin. The environmentally unconscious individuals are turning potential resources into trash

Milan Zivkovic,
Supply Chain Director

Given that examples of useful and environmentally friendly use of materials, which we commonly find useless, are taking up more and more media space, we would say that we are becoming better informed about that topic. One example of good practice comes from Simanovci, near Belgrade. The company Strauss Adriatic, which operates in the Serbian market since 2003 and owns the brands Doncafé and C kafa, is located in this village in Srem. Thanks to it, we drank countless cups of coffee, gossiped on too many ex-partners, and perhaps successfully predicted what someone's fate would be.

You may not be aware that chaff is created during the coffee processing process as well. When we were exploring the factory, Milan Zivkovic, Supply Chain Director at

Photographs: Strauss Adriatic

Strauss Adriatic, explained to us what the chaff is, how it is produced, and how this waste is used for heating.

But let's start from – the beginning! In this case, it is thousands of kilometres away from Serbia - and is located in Brasil, Colombia and Honduras, where coffee is grown. "The fruit of the coffee looks like rosehips. There are two seeds in its interior that are processed to make the beverage," said our interlocutor at the kickoff of our unusual journey from Latin America to Simanovci, and we have already envisioned endless plantations and diligent workers in colourful clothing harvesting coffee beans.

The containers with bulks containing 21 tonnes of raw coffee arrive at the largest Croatian port of Rijeka because it is the most convenient option for transport. "If packed in jute bags, it would only fit 19 tonnes in a container - so two tonnes less. It means that by delivering larger quantities in one container, we get free shipping for every tenth container," Milan explained, adding that, in addition to the company's financial costs, it also reduces the emissions of cargo ships while sailing from one to the other end of the world.

Before finally reaching the production facility, coffee has one more station on the way. According to Milan, the goods are sacked under customs supervision.

Then, another ride followed by storage and roasting comes!

"When you roast a raw coffee bean in a drum at the 200 to 250 °C temperature, its volume rises by about 40 per cent. After that, with the flow of warm air, a silver membrane, or chaff, peels off from it," Milan explained patiently to us.

Until 2012, the final destination for coffee chaff from the Doncafé plant was a local landfill. After an innovative discovery of workers and an investment of 90 thousand euros, the chaff today ends its life cycle in the furnace.

By mixing the chaff with water as a binder and then briquetting, the total energy of 14 GJ/t is obtained. Although that is less than with wood briquettes or fossil fuel, we should not overlook the fact that by using biomass, as Milan pointed out, Strauss Adriatic burned 100 tonnes of municipal waste that would otherwise end up in a landfill.

Each year, through the process of processing raw cof-

fee, Strauss Adriatic is left with about 140 tonnes of coffee chaff, which is then briquetted. Thanks to the use of coffee chaff for heating, they have cut down fossil fuel consumption, and therefore reduced carbon dioxide emissions for about 9 to 10 per cent. The project was developed in collaboration with the Faculty of Mechanical Engineering, and the return on investment was in just a year and a half. For their own needs, the company has made a hybrid boiler that burns wood briquettes in the absence of coffee ones.

Sustainable business is based on the high standards of the Strauss Group of which Strauss Adriatic is a member.

"We take care of the emissions of harmful gases, water consumption, energy consumption and generation of municipal waste. Project on rainwater harvesting is currently underway. Water will be used to irrigate green spaces within the plant. We are also considering a project to install photovoltaic solar panels," Zivkovic added.

All of us who come into contact with products labelled Doncafé in supermarkets and cafes are direct participants in their energy transformation.

Prepared by: Jelena Kozbasic

FROM A SMALL FAMILY DAIRY FARM TO THE MARKET LEADER

Strauss Adriatic is a member of the Strauss Group founded in Israel in the 1930s by Richard and Hilda Strauss. Formerly a small family dairy farm, today it is one of the leading producers in the global food and beverage market.

More than 16 brands operate in 10 different countries under the auspices of the Strauss Group.

DUE TO RESIDUE

Even though as individuals, we do not have the necessary capacity to make briquettes from the chaff, there is another waste that results from the daily ritual of enjoying coffee, which we could undoubtedly turn into practical creations.

Strong Turkish coffee that gives you energy will also serve your plants without you being deprived of a sip. If you mix the sludge in the garden soil, it will stimulate the growth of flowers. Besides, it will protect them from pests such as ants, house snails, and slugs.

By applying coffee residue from the bottom of the cup to cloth, you get a natural abrasive cleaner, saving you the money you would otherwise spend on cleaning products.

If you like the scent of this beverage, why don't you make homemade candles from coffee grounds? First, dissolve the wax in the metal dish, that you put in the pot filled with water. Sprinkle dry sludge into the bottom of the paper cup, in which you previously placed the wick, and carefully pour the dissolved wax over it. When it hardens, after around 20 minutes, cut out a paper cup and set your candle free. All you have to do is place it in a nice candle holder, light it up and enjoy the mesmerizing coffee scent.

INITIATIVE IN INDJIJA

Life in a local community can be much better if it fosters a collective spirit and turns criticism into action, as eight students from Indjija demonstrated by founding the Association Indjijativa. For a year and a half, they roused dormant citizens and municipal authorities and solved more than 100 problems in their city. The spirit of their activism is now slowly spreading across Serbia

We would all like to have a healthier and better-arranged environment, yet again there are very few situations in which we are ready to do something about it jointly. When they realised that want to change many things that bother them in their city and that criticism and complaints will not improve anything, eight students from Indjija spontaneously came up with the idea to do something and move from words to deeds. That is how the Indjijativa, an association of volunteers and activists, was created with the aim of working together with citizens and authorities on identifying and solving various problems in their local community.

With their activity, the members of Indjijativa have awakened their fellow citizens and authorities of municipal government, although reactions to their work have been divided from the very beginning. "There were both positive and negative reactions. Citizens initially observed us with a great deal of suspicion, seeking to fathom the motives of our work which they thought were hidden and driven by personal interest. On the other hand, the municipal authorities had a very positive attitude towards us since they liked the zest and enthusiasm we radiated. Things changed, over time. Citizens have come to love us, due to the work and act that stood behind us, and we were not afraid to praise the municipal government when there were reasons for it, but also to criticise when criticism was more than necessary. With such an attitude, however, the doors of the municipality were left ajar to us," says Mladen Rajic, one of the activists of the association, which now has seven experts of different professions, united in their desire to encourage positive changes in the society.

The fellow-citizens regularly contact them via email or social networks with the request of solving a problem, and the members of Indjijativa ask them to describe the issue in detail and to send them a picture or a video. Very often, they conduct site visits and talk to citizens about the problems that bother them. Then they contact the relevant services through the System 48 – a platform implemented in the municipality to report utility problems. If there is a different type of problem, they address the institutions in written or oral form, using all the means and tools secured by legal regulations and according to the rules of democratic society operation – they write petitions, requests for the information of public importance, petitions, etc. "What is perhaps our mark/STAMP is that we give a media character to everything which brings the problems closer to the whole community. That creates public focus and achieves a certain amount of pressure that encourages decision-makers to come up with a solution," Mladen points out.

Much of their credibility has been built through the portal indjijativa.rs and social networks, which helped them

Photographs: Indjijativa

PROBLEMS THAT CONCERN EVERYONE

At the top of the environmental priority list of Indjija is the air quality due to the increased number of diffuse pollutants that come to the fore in this period (the beginning of the heating season, the burning of harvest residues..). In the second place is the lack of an adequate network of atmospheric and municipal sewage systems, as well as the lack of local wastewater treatment plants. "What may be a major problem in the future is a large decline in the quality of arable land due to industrialised monoculture farming which is accompanied by inadequate physio-chemical technologies. The problems have been identified, and we all have the responsibility to solve them", says Mladen.

to become more visible not only locally but also across the country. Thus, the residents of Indjija, as well as the whole of Serbia, can see that this association has been able to initiate and help to solve more than 1000 problems in their municipality over the past year. They are proud of each of those actions, but they set aside a charity picnic at the Koki Zoo, where they organised series of workshops and an auction of paintings, and the money they raised was given for the treatment of two little fellow citizens. Action-reaction attracted significant attention, when the members followed up illegal cut down of two linden trees in the centre of the city and asked the authorities to punish the perpetrator and plant new trees. The last action they are particularly proud of is launching a campaign #prO2disi that encourages fellow citizens to plant trees and reduce the use of plastic bags.

Based on the previous experience, the members of Indjijativa noticed that the citizens are most sensitive to problems for which it is clear that the money from the budget was poorly used or misspent. "Those problems directly affect the majority of the citizens, and they activate around them more," says Mladen, adding that on the other hand, the municipal authorities are most firm on the issues that directly indicate the irresponsibility of the authorities. "Usually, these are the things that should have been resolved by a project or allocated funds from a budget, but they haven't. Here we come upon a conflict that escalates with any criticism that is publicly addressed to those who we find guilty. Certainly, it is complicated to solve problems that require a strategic and long run of dealing with them, since the perspective of those responsible for dealing with the problem usually extends over a four-year period – which is a length of their term."

There are also situations in which a problem cannot be solved persistently, but the members of Indjijativa do not surrender. One such an example is the problem of a curb located at the pedestrian crossing that is unsuitable for people with walking difficulties or moving in wheelchairs, as well as mothers who often pass there with strollers since it is at the beginning of the pedestrian zone in the city centre. "We have been waiting for the solution of the problem, precisely for the curb to be removed, for almost a year. We got promises from the competent authorities that the problem would be solved within a few days, another one when the construction season begins, etc. The reasons why this has not been resolved yet are now clear to us, and for the anniversary of not solving the problem, we are preparing a performance which will, as we hope, draw attention and resonate beyond Indjija and provoke a reaction. The point is not to give up on any problem," Mladen points out.

One of the goals of the association is to make Indjija, as one of the least green municipalities in Vojvodina, European Green Capital. Since Vojvodina is generally poorly afforested region, and Indjija is one of the most developed municipalities, the members of Indjijativa believe that it should take the lead in reversing this trend. Indjijativa members did not only awake Indjija, but they have also motivated many local communities across the country.

At the end of the year, Indjijativa members are slowly finishing the existing actions, such as planting trees, and they are preparing for the new ones. Soon they will set "kind-hearted" racks, on which citizens can put away their unnecessary clothes so that the ones who need it can take it. At the same time, they are working on a project for revitalisation of children's playgrounds and sports fields in the municipality with an emphasis on increasing the green areas. The project should start at the beginning of the next construction season if everything goes as planned.

When asked how much Indjija changed in the last year and a half, Mladen Rajic proudly points out that despite pollution, their activism is being spread in the air, and it provokes positive reactions among citizens. They are now motivated to step out of their comfort zone, speak out loud about their problems, and start looking for a way to solve them themselves. The members of this association are encouraged by the fact that they realise they are not alone and that they have the support and help.

Prepared by: Gordana Knezevic

KNOWLEDGE FROM SARAJEVO BECOMES THE DEVELOPMENT POTENTIAL OF THE REGION

About 300 km from Belgrade, there is one city which I love a lot. Sarajevo is located on the coast of the Miljacka – which would perform a miracle indeed if it demolished bridges as said in a famous folk song. There, I learned about the relevance of making a difference between a pie and a burek (traditional meat pie) and the irrelevance of making a difference between people. In Sarajevo, I discovered an enterprise who makes lives and environment of its present and future residents more comfortable and healthier as well. The company in question is Enova, the leading provider of energy, environmental and security services in Bosnia and Herzegovina

Already in its name and slogan "Inspired by the future", it shows a commitment to innovative ideas. I had the opportunity to speak with a young, curious and ambitious team of Enova experts who have been implementing projects in their country and region for ten years to transform knowledge into development potential.

Their success is established on the most valuable resource - people, and they base their business on integrity, a culture of collaboration, commitment, excellence, willingness to learn and adaptability. They believe that if they want to be useful to society, they should not only do better or more but work differently.

Enova's business portfolio includes major international institutions, for instance, the European Commission, the World Bank and the International Finance Corporation. With this in mind, it is not surprising that the City of Sarajevo and the United Nations Development Program (UNDP) have entrusted them to design smart urban planning and

Photograph: Unsplash/ADEV

public opinion analysis tools through the Sarajevo - Smart City initiative funded by the Swedish Government.

The smart urban planning tool is a numerical simulation of airflow and is based on computational fluid dynamics. The software enables the dynamic calculation of air currents and the dispersion of pollutants in space and time in real orography. It includes details of urban amenities in critical meteorological conditions such as temperature inversions or wind-free situations, they explained to me in Enova, noting that the simulations would show how urban amenities also affect airflow and pollutant concentrations.

No matter how complex the process of obtaining this information seemed to me as a layman, Enova's team assured me that the results would be easy to understand for decision-makers and citizens alike. Besides, they are also developing an easy-to-use tool that will enable the analysis of civic expectations when it comes to urban amenities, such as recreation zones, changes in modes of transport, construction of facilities, parks and the like. Citizens will be able to download the application through social networks, or they will be able to express their opinions on screens placed in public places. Enova's intention is to encourage citizens to think and get involved in the decision-making

process. The ultimate goal, in order to encourage the city's inventiveness and thoughtfulness, is to implement sustainability into urban planning. They also hope to expand it to other cities.

Focusing on Enova's inspiration, Sarajevo seeks to green its surfaces and enrich biodiversity and to use geothermal energy and energy-from-waste.

Hydropower is a fairly represented renewable source in our neighbour's energy mix, so I was interested in the public's perspective on small hydropower plants. In all likelihood, the people of Bosnia and Herzegovina are concerned about the impact of small HPPs on flora and fauna. Accordingly, Bosnians are often organizing protests and signing petitions against their construction. Recently, Enova's team, in collaboration with the German Organization for International Cooperation (GIZ), worked on a catalogue of criteria for the sustainable evaluation of small HPPs, which should help assess the impact of hydropower projects on water and the environment. It is intended for both investors and decision-makers. It is well known that Bosnia and Herzegovina is rich in natural resources. Still, in order to sustain them, they must be managed acceptably while preventing negative consequences.

A smart city also requires transportation with the same epithet, and members of Enova notified me that the Sarajevo Cantonal Government recently signed a loan arrangement for the procurement of low-emission vehicles for public transport. Enova has been involved in the development of the Green Action Plan that involves a series of proposed sustainable mobility measures. These include the extension of bicycle lanes, the creation of pedestrian corridors, multimodal (combined) transport with suburban connectivity, and more.

According to company representatives, a comprehensive strategic approach is needed to raise awareness of the effects of air pollution. First of all, it involves identifying the target groups. Enova advises that youth should be motivated to turn bike pedals more instead of a steering wheel but draws attention to the need for time and dedication to educating the population, as well as monitoring technological progress and change in the community.

The company believes that there are several challenges on the path of Bosnia and Herzegovina towards more innovation, more extensive use of renewable energy sources and higher levels of energy efficiency. These include outdated technology, a lack of funding, insufficient cooperation between government, industry and the scientific sphere, and the associated lack of technology parks and hubs that would "build" a bond between stakeholders, all for the welfare of the community that would be achieved strengthening energy security.

Prepared by: Jelena Kozbasic

Photographs: (middle left) Pixabay; (top right) Enova

Carport with 8 parking lots and solar power plant with 20 kW capacity

PROVIDING SHADE WHILE GENERATING CLEAN SOLAR ENERGY

CARPORT FOR INSTALLATION OF SMALL SOLAR POWER PLANT

We have engineered and constructed solar carports for private corporations:

- All solar carports are adjusted to weather characteristics such as wind and snow load for each country climate conditions
- Dependent on the number of lots of parking required, we can offer photovoltaic carports with typically 2 or 4 lots without footpath and the carports with 4 lots with footpath
- Solar parking lots can be extended by adding poles to be large enough to span up to 8 parking places. For more than 8 parking lots thermal dilatation has to be done

INSTALLING A SOLAR CANOPY CAN POWER YOUR PREMISES OR YOUR EV CHARGERS

Carport with 2 parking lots and solar power plant with 5 kW capacity

Carport for 2 parking lots without footpath is suitable for installation of 15 PV modules

Carport for 4 parking lots without footpath is suitable for installation of 30 PV modules

Carport for 4 parking lots with 2 m wide footpath is suitable for installation of 36 PV modules

Powered by

MT-KOMEX D.O.O.
ENERGY&WELDING SOLUTIONS

www.mt-komex.co.rs
Info@mt-komex.co.rs
011 77 04 566

PROPULZIJA
DESIGN & MANUFACTURE

Excellent
Small & Medium Enterprises
Privredna komora Srbije

NATURE'S OASIS "CARSKA BARA"

How Carska bara recovered after the fire incurred by stubble burning and how wildlife is taken care of at the Special nature reserve Carska bara, we asked Dejan Zejak, the manager of fish farm Ecka, which runs the above-mentioned nature reserve. Needless to say, we took advantage of that chance to also find out to what extent is the popularity of Carska bara as a tourist attraction and what the traditional cuisine of this region is

SPECIAL NATURE RESERVE CARSKA BARA

The biggest fresh-water fish pond in Serbia and the special nature reserve Carska bara is a protected area of both national and international importance as Ramsar site, Important bird and biodiversity area in Europe (IBA), Important plant area (IPA) and a part of Emerald network.

The fish farm Ecka comprises units for fish and spawning stock production, tourism and hospitality industry, as well as hunting and fishing.

Photographs: The fish farm Ecka

The last year battle for preserving the natural resources of this region against the blaze Dejan Zejak described as a casualty in which the area affected by the fire had added up to 338 hectares. "It was sheer luck that it was October, the time of the year when offsprings had already grown up and managed to draw back in the face of the flame while migratory birds had moved south", explained Dejan. He added added that the belvedere was burned down, as well as the wooden footpath that stretched to it and was at the part of the reserve which was inaccessible to firefighters.

The cause of the fire in these circumstances usually appears to be reckless stubble burning. Last autumn, the fire spread from the summer home area, which lies along the Zrenjanin-Belgrade road, straight to the nature reserve.

Among the reed and rush

Each year, this nature reserve in cooperation with the Bird Protection and Study Society of Serbia observe the number of birds' species and their migration. And how impressive the particularities of plants and wildlife of this nature reserve are, says Dejan. "The major signature of this place is birds and here is one of the most significant ornithology station in this part of Europe. Neither one protected area has at its verges a fish pond of this size which serves as a huge food resource and a cause of this high numerosity and variety of birds. Around 250 birds' species are registered here, as well as animals that feed on fish. All ten species of herons which live at the European continent nest only in our nature reserve. There are white-tailed eagles, but also a huge number of otters is reported, which are classified as highly protected species and true indicators of water quality. When it comes to fauna, there are more than 500 different plants."

As the cold wind was blowing that day, ember was flown across the Begej channel into the nature reserve. Initially, the part of the nature reserve called Perleska bara caught fire, that was subsequently spread to Tiganjica, Stari Begej, also Carska bara, Botoski rit and Fakazdinski rit. The blaze was spreading ever further towards the village of Belo Blato, but it was eventually put out on the edge of that village.

Upon being asked how these accidents might be prevented, but also how to get through to the farmers in the most efficient way to reduce the consequences incurred by stubble burning, Dejan Zejak replied that it is necessary to "educate citizens and bring awareness of damage caused by stubble burning", indicating for that matter that the latter activity primarily spoils the soil quality. Also, he believes that the culprits, namely those who keep on clinging to that bad custom, should be fined.

However, Dejan suggests that this autumn fewer fires were registered in the area, along with more strict control. He reckons that it is still going to take a lot of time until this dangerous habit of thoughtless people becomes eradicated.

Fighting the fire wasn't the only challenge the nature reserve had to deal with. A few years ago they had problems with sludge deposits which threatened plants and wildlife in the fish pond, reducing at the same time the number of tourist visits as the approach to the tourist boat was restrained. Last year they got a small grant from the Min-

During the cold winters, the reserve's staff makes small apertures in the ice to provide fishes with oxygen whereas **during the extreme droughts they pump in water into Carska bara** so that the ecosystem wouldn't be in danger

istry of environmental protection for meeting the costs of partial dredging of the part of the Stari Begej bed. The fish farm Ecka now serves as the only source of income being used for improving the tourist offer at the nature reserve.

Protection first, tourism later

As for tourism, the nature reserve Carska bara is a typical case of sustainable tourism, and as such it is cited in the books for positively demonstrating the advance on that field. "The number of the visitors is limited due to the specificity of the nature reserve and sustainable development, so we can't aim for a significant rise in the number of tourists as it would lead to endangering the birds which are the main feature of this reserve. Our employees take care of the visitors' conducts, and the focus of our tourist offer is on education and raising awareness of the proper treatment towards nature", says the manager of the fish farm Ecka pointing out that the reserve protection is primary. "Tourism is secondary, for that matter."

He believes that their tourist offer could be significantly improved by building another belvedere, getting canoes and pedalos, as well as by placing information and education boards which would give pieces of advices to visitors in the reserve zones where those activities could take place. It seems that the full potential of this place hasn't been tapped into, which is caused by the lack of money, which is their biggest obstacle.

The staff at the fish farm tries to save this nature reserve from climate change. Dejan brings out that they pay special attention to restraining the human factor so that it doesn't ruin the natural processes of the ecosystem. During the cold winters, the reserve's staff makes small apertures in the ice to provide fishes with oxygen. In contrast, during the extreme droughts they pump in water into Carska bara so that the ecosystem wouldn't be in danger. All of these activities are done according to the directions given by the Institute for nature conservation of Serbia.

Dejan thinks that the situation with the fishery and its future in Serbia is volatile, as it all depends on factors which affect the production estimation, such as viruses and diseases, whose effect is damage beyond repair. Talking about downsides, he stresses the problem of the black market and also extremely low subsidies in comparison to the region, which substantially reduces competitiveness.

However, along with all challenges, the tale about the Ecka carp still goes around. This fish has been bred at the Ecka fish farm ever since 1891, and it is known for its particular taste which probably should be attributed to the water and soil quality, namely substrate of the fish pond. There was the time when the Ecka carp was a must-have delicacy at the restaurants' menus and holiday dinner tables throughout former Yugoslavia, and it was also exported to Macedonia, Italy and Germany. Today the widely famous carp of Ecka can be found at some chain stores and delicacy stores.

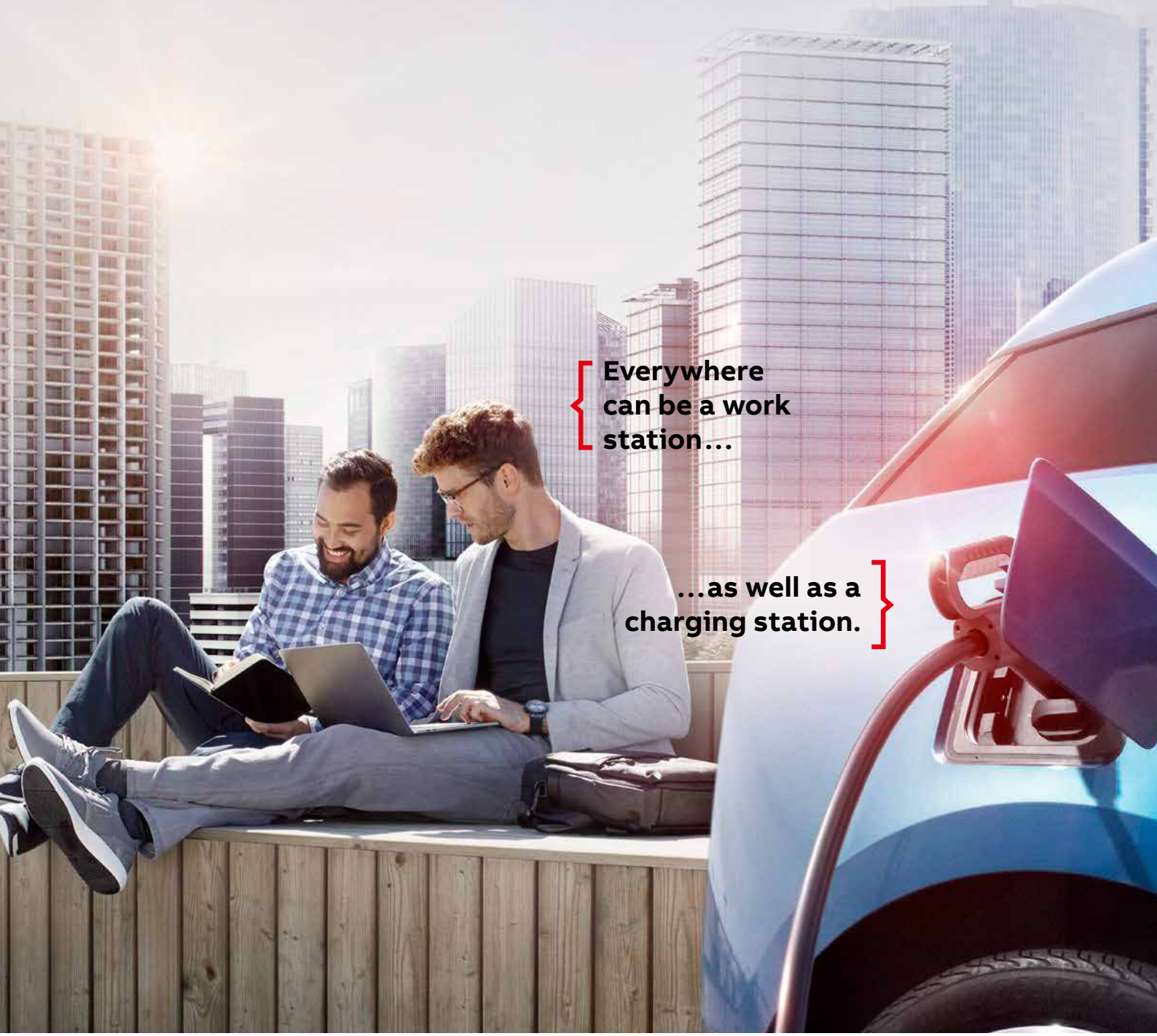
Dejan told us about his favourite fish recipe. The delicacy name is the Carska fish broth which is made from carp fillets, and you can try it next time you head for Zrenjanin if you remember this article, so you decide to take a break at Carska bara.

Prepared by: Jelena Cvetic

+381 11 3098 555

www.struja.rs

SLV



Smarter Mobility

Holistic charging infrastructure solutions

They say that EV charging infrastructures are the ‘fuel station of the future’. With its future-proof charging technology and unrivalled connectivity, ABB wants to ensure that the affordable, long-range electric vehicles of tomorrow are fully supported by reliable infrastructures today. ABB charging points and fast-charging stations will be the fuel of electric cars, electric buses and other passenger service vehicles.