ENERGETSKI PORTAL SRBIJE

ENERGY PORTAL

business web portal about clean energy

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RENEWABLE SOURCES OF ENERGY

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STRONG SUPPORT
for Renewable Energy Sources in Vojvodina

The Guarantee fund of Autonomous Province of Vojvodina was founded on 18 December, 2003 and since then has provided a credit line from banks by concluding agreements on business cooperation with those financial institutions that are willing to support the program activities of the Fund and the conditions of crediting. Currently, there is a competition for energy efficient equipment necessary for the use of renewable energy sources, and it relates exclusively to the territory of Vojvodina. In addition, this institution actively seeks to educate and inform the public about renewable energy sources and the benefits that they bring. That is why they organized an international conference 'Promoting renewable energy sources: biomass in agriculture' held on 12 May, 2015 in Novi Sad as a part of Novi Sad Agricultural Fair. For a special edition RENEWABLE ENERGY SOURCES, we talked to Mr. Goran Vasić, the Director of the Guarantee Fund of AP Vojvodina, about the results and efforts that this institution invests in the change.

EP: The Guarantee fund of AP Vojvodina provides guarantees for loans granted for financing the procurement of energy efficient equipment and equipment necessary for the use of renewable energy sources. What exactly does your institution support and in what way?

Goran Vasić: The Guarantee Fund of Autonomous Province of Vojvodina was established on 18 December, 2003 by the decision of the Assembly of AP Vojvodina. The Fund is registered in the Register of Funds on 15 April, 2004 and on that day it gained a legal status. The mission of the fund is to provide easier access to financial markets and favourable credit conditions (lower interest rates, longer loan repayment periods, longer grace period) for farmers, micro, small and medium-sized companies, cooperatives and entrepreneurs from the territory of AP Vojvodina, by issuing guarantees as

Action	Action effect	Value of issued guarantees according to their purpose (face amount)	Value of issued guarantees according to their purpose (absolute amount)	Number of guarantees
Purchase of mineral fertilizers	20.148 tons of NPK	334.053.488,80	599.757.752,73	42
Purchase of agricultural machinery	1.143 units	3.220.484.590,48	5.050.890.061,62	1009
Support for women's enterpreneurship	869 new jobs	296.752.079,08	480.695.209,74	230
Purchase of agricultural land	1550 acres	532.489.692,64	1.051.020.975,66	326
Export stimulation	781.000,00 evro	62.500.000,00	96.875.000	12
Total		4.446.279.851,00	7.279.238.999,75	1619

means to reduce the risks of commercial banks. The vision of the Fund is continuous development into a stable, competent and reliable financial organization that tends to reconcile its business rules with the business practices of similar institutions in the European Union. The main objectives of granting guarantees are encouraging: increase in employment, export, competitiveness, the development of areas and branches that have an impact on changes in economic structure, that is the optimal use of corporative advantages of AP Vojodina, more dynamic and balanced regional development of AP Vojvodina, the reduction of the level of effective interest rates on loans.
We operate so that we conclude an agreement on business cooperation with the banks that are willing to provide their credit lines to support program activities of the Fund and to adapt credit conditions (interest rate, term and method of loan repayment) to those that are defined in the work program of the Fund and in the competitions that the Fund announces for granting guarantees for providing loans designed for financing certain economic activities.

EP: In what amount have the projects in the field of EE and RES been supported? What is their development like? Could you please describe, in detail in terms of time and purpose, what has been realized so far?

Goran Vasić: On this occasion I present to you a summary of total competitive activities for the period 2005 – 2015. It is a table which shows issued guarantees according to their purpose.

EP: Do you cooperate with funds from the EU and which funds are those? Do you exclusively support project in Vojvodina? Tell us something more about that international cooperation and development plan of the Guarantee Fund of AP Vojvodina in the future.

Goran Vasić: In 2015 the Guarantee Fund of AP Vojvodina continued, previously established cooperation with the European Association of Mutual European Guarantee Societies – AECM, founded in 1992 in Brussels and today has 40 members. Most of them are member states of the European Union. But there is also Russia, Turkey and Montenegro. The Associations gathers private guarantee schemes, public institutions, guarantee funds and development banks. All these institutions have a mutual main goal to support small and medium enterprises and entrepreneurs, who have good projects, but do not have adequate provided funds for their financing by commercial banks. In addition to promoting instrument to support SMEs by providing guarantees, The Association of Guarantee Funds represents the interests of its members in the European Commission. The Fund submitted an application for membership in 2015 and became a member of this Association. As a member of this Association, the Fund will be recognized in the European Union, and the most important benefits will be the possibility to exchange information and experiences with Association members from other countries and easier providing and withdrawal of funds from the European Union. Among others, Associate members are: Austrian AWS, Croatian HAMAG, Turkish „Teskomb," Bulgarian national guarantee fund NGF and German VDB. The table shows the level of the guarantee portfolio and the number of guarantees issued in 2014 for stated members of The European Association of guarantee institutions.

Within the Association there are guarantee institutions whose target is supporting energy efficiency and renewable energy projects. They are predominantly located in Germany and our intention is to establish cooperation and thus create conditions for knowledge transfer and implementation of good practices. Special attention will be given to projects of energy rehabilitation of buildings with collective housing with a large number of apartments where you have problems with coordinating and guaranteeing investments. Particularly interesting are the cases when due to the lack of will or the financial means of several apartment owners, planned investments of dozen of owners, who are ready and willing to undertake the investment, come to a halt.

Guarantee fund started in August, 2014 a project entitled "Promotion of renewable sources: biomass use by farmers in Vojvodina" which is jointly funded by the Heinrich Boll Foundation and the Fund, according to the Partnership agreement for the implementation of this project that the Fund concluded with the Heinrich Boll Foundation. The project objectives are fully coordinated with the priorities established by the Work program of the Fund. The Project's overall goal is the promotion of production and use of biomass in agricultural production in AP Vojvodina, which will enable building trust and informing farmers in Vojvodina about the use of agricultural biomass as energy

	Austrian AWS	Croatian HAMAG	Turkish „Teskomb"	Bulgarian national guarantee fund NGF	German VDB
The level of the guarantee portfolio	797.400.000	160.734.000	4.386.772.000	107.299.000	5.701.141.000
The number of issued guarantees	5.132	1.416	310.277	1.218	47.711

source, development and promotion of financial instruments for the production and use of biomass from agricultural production and increased use of renewable energy sources. As a result of this project a publication "Promoting the application of biomass in small and medium-sized farms in Vojvodina" was created and promoted in May 2015 during the International Agricultural Fair. On that occasion an international conference was organized and dedicated credit line was promoted, which was supported by the following banks: AIK bank, Banca Intesa, Credit Agricole, Hypo Alpe Adria, Komercijalna bank, ProCredit.

THE LIST OF AREAS THAT WILL BE CREDITED IN THE FUTURE

1. Buildings:

Replacement of the heating system: Replacing old heating systems with modern systems and conventional boilers for central heating with modern and more efficient condensing boilers. Replacement of the cooling system: Cooling space involves the purchase of coolers – new compressors with 8 cm of thermal insulation without Freon R-22. Insulation of external walls and roofs. This means that the exterior walls and ceilings are without any external insulation. Measures must contain the installation of appropriate materials for thermal insulation materials (for example, styrodur, and mineral wool) and that the thickness is in accordance with the standards of energy efficiency. Replacement of external windows. This includes windows with a single glaze/ non insulated windows or old windows with double-glazed windows. Windows with single glazing or old double-glazed windows must be replaced with double-glazed windows with modern thermal – insulated glazing as a minimum standard for windows. Replacement of external doors. External doors that are not thermally insulated have to be replaced with modern pre-insulated door. Replacement of unregulated heating pumps for central heating with new, electronically controlled pumps. The existing built-in pumps of hot water heating systems operate without electronic control. It is necessary to replace them with pumps with electronic regulation.

2. The use of renewable energy sources:

Solar thermal systems for domestic hot water. The installation of new solar thermal system for preparation of domestic hot water, with flat collectors. Maximum collector area is 50 m2. Replacement of conventional heat production system with electric heat pumps with heat sources which can be soil, water or air. The installation of a network photovoltaic system. The installation of new photovoltaic system with solar PV panels. The system has to be connected to the grid.

3. Lighting:

Replacement of incandescent (classic) bulbs with new CFL bulbs. The space is illuminated with classical incandescent bulbs, which should be replaced with modern CFL bulbs. Replacement of old fluorescent lamps with modern T5 lamps with electronic ballast. According to the current situation, the space is illuminated with older fluorescent lamps (T8 or T12) with electromagnetic ballast. Those fluorescent lamps should be replaced with modern fluorescent lamps (T5) with electronic ballast. Usually it is necessary to replace the lamps together with lighting elements.

4. Agricultural equipment:

New agricultural machinery (tractors, harvester) with Tier III or Euro 3A engine as well as multifunctional machines with a minimum of three functions. Agrultural tools. Agricultural tools which can be financed are those that reduce energy consumption during field works with improved treatment systems (reduced tillage, protective treatment, processing into strips) and sowing (direct sowing in furrows and direct sowing in holes). Heat recovery in dairies. This measure includes the installation of heat recovery system for dairies. The heat from the extracted milk will be used during the cooling process for pre-heating of lukewarm and warm water. Installation of a simple heat exchanger and installation of heat exchanger with an additional condenser of cooling system can be financed. The new harvester with Tier III or Euro 3A engine. Replacement of the irrigation system. Procurement of new irrigation systems with the pump driven by energy efficient engine.

Interview by: Vesna Vukajlović

HYDROPOWER POTENTIAL
of Nova Varoš Municipality

The municipality of Nova Varoš has a considerable hydropower potential. Hydro power plants 'Uvac', 'Kokin Brod' 'Potpeć' and reversible hydro power plant 'Bistrica' are located on the territory of the municipality. In order to present the potential of the municipality, the Energy Portal has talked to an independent expert associate for Agriculture and Rural Development of Nova Varoš municipality, Mr Milinko Šaponjić. The hydro power plant 'Bistrica' is the first hydro power plant built on the river Uvac, in the municipality of Nova Varoš. The plant was put into operation in 1960, and the type of hydro power plant is an impoundment facility. The power of HPP 'Bistrica' is 104MW and this is the largest hydro power plant on the Uvac river. HPP 'Kokin Brod' with powerhouse at the toe of the dam was put into operation in 1962. This hydro power plant has two generators of total power of 22.5MW. HPP 'Potpeć' with powerhouse at the toe of the dam was put into operation in 1967. This power plant is also located on the Uvac river, and it has the power of 54MW. It annually produces about 180 million kWh of electricity. The last built HPP on the Uvac river is eponymous HPP 'Uvac'. This HPP was put into operation in 1979, and it has the power of 36MW. This power plant is of diversion type, and it produces around 70 million kWh of peak energy annually.

EP: What are the main hydro potentials of Nova Varoš municipality?
Milinko Šaponjić: The main hydro potential of the municipality are three hydro power plants located on the rivers Uvac and Lim, the impoundment hydro power plant 'Bistrica' but also the small ones.

EP: How many SHPP are in the possession of Nova Varoš municipality?
Milinko Šaponjić: The municipality owns three small hydro power plants which are located on the Bistrica river. Those are SHPP 'Rečice' of the installed power of 930kW, SHPP 'Crkvine" of the installed power of 850kW and SHPP 'Hydra-electro' of the installed power of 100KW.

EP: Spatial Plan of Nova Varoš municipality envisages the construction of 20 small hydro power plants. How far did you come with the implementation of these projects?
Milinko Šaponjić: Our municipality is competent for issuing permits for construction of 6 SHPP, while the Ministry of Construction, Transport and Infrastructure of the republic of Serbia is competent for the other 14, due to the fact that they are within the limits of the Spatial Plan for the special purpose areas of the Uvac Special Nature Reserve. So far, building permits for four small hydro power plants have been issued

that are under the jurisdiction of Nova Varoš municipality.

EP: There is a plan for the construction of HPP 'Bistrica 2'. At what stage is the implementation of the project?
Milinko Šaponjić: There are still no requests for issuing the necessary permits for the implementation of this project. In the local energy plan the construction of this project has been defined as one of the priority projects of the municipality and the corresponding Ministry. There is a huge interest of investors, and at the moment we are negotiating on developing of the Feasibility Study with Preliminary Design and Environmental Impact Assessment on the environment. It is expected that HPP 'Bistrica 2" will have the installed power of 680MW, while the investment value is 600 million euros.

In addition to hydro potential, biomass represents huge energy potential of Nova Varoš municipality. Thus the municipality developed the Study 'The Potential and Possibilities of Using Biomass for Energy Production and Economic Development of Nova Varoš, Priboj and Prijepolje' in 2009. This study showed that the wood biomass energy potential of Nova Varoš is higher compared to the heavy fuel oil energy for 4.95 million kWh. This means that the available quantities can fully meet the users' need for energy, but also that they can enable the expansion of existing capacity and the network of users or running cogeneration plants for the production of electricity and heat which will use biomass as an energy source.

Interview by: Sandra Jovićević

SERBIA HAS REMARKABLE WIND-BASED
Energy Generation Potential

Energy portal had chance to meet in Novi Sad Mr Henk van den Dool, ambassador of Netherlands in Serbia. We talk to him during the fair "International days of energetics and investment" which were held in March. He presented energy sector of his country at the opening ceremony of the international conference Perspective & Challenges in Energy sector. In the summer of 2015, Henk van den Dool was appointed Ambassador to the Republic of Serbia in Belgrade. He is also accredited to Montenegro. The main areas of expertise and interest of Ambassador Van den Dool are European Integration, Human Rights and transformation processes in Central and Eastern Europe. Since Serbia has many challenges to solve in process of EU integration, his opinion about energy sector is very useful.

EP: Can you please compare The Netherlands and Serbia, speaking of renewable sources of energy, and due to this comparison tell us what should we change here in Serbia?

G. Dool: The Netherlands has a strong, innovative energy sector, and the government wants to further strengthen its competitiveness. This is good for the Dutch economy and will thus contribute to economic recovery. The government has therefore identified energy as a priority sector. In the area of green energy, the approach focuses on the development and profitability of renewable energy technologies. Innovation is essential for making renewable energy competitive, and business can benefit by selling these technologies on the domestic and international market. The emphasis must therefore move towards stimulating innovation and move away from promoting renewable energy through expensive and ineffective operating grants for unprofitable technologies.

I am often saying that The Netherlands is a very efficient country compared to many other countries, including Serbia. The main reason for our resource efficiency is that we were forced to cope with very limited resources for a long period of time, and at the same time we strived to be as independent as possible from external suppliers. The EU integration process is very precise when it comes to legislative framework adjustments, and Serbia has progressed significantly in this sense. The main challenge in Serbia is the implementation of existing legislation, and in this sense, more focus on this aspect would be beneficial. Serbia has accepted its 2020 targets and is still far from the threshold of 27%. This means that developers in all renewable sectors should be supported more by more efficient and transparent administrative procedures, while at the same time efforts to save energy in public and private consumption should be stimulated.

EP: Since wind power plants are very developed in Netherlands, is there maybe a plan for some investment in Serbia in the future period, and what companies are planning to invest in Serbia?

G. Dool: The Netherlands has embraced a courageous vision: by 2050, the country will have a sustainable, reliable and affordable energy system. As part of this, the Dutch aim to cut CO2 emissions by half, and to generate some 40 percent of our electricity from sustainable sources such as wind at sea and biomass by that time. The Dutch have leading expertise in offshore wind energy, co-combustion of biomass in coal-fired power plants, methods to pre-treat biomass, the use of landfill gas, and the use of heat pumps combined with heat and cold storage. The Netherlands distinguishes itself from other countries with its offshore know-how, which is vital for wind projects at sea. For instance, the Princess Amalia offshore wind farm is the largest of its kind in the world outside the 12-mile limit, and is also built in the deepest water. Also, the largest European wind turbines testing site is located in the Netherlands, near Lelystad.

Serbia has remarkable wind-based energy generation potential as well. The entire south Banat and large parts of eastern Serbia have been recognized as good areas for wind parks development. It is enough just to look over Danube at the Djerdap gorge and to see how much electricity generation is taking place at the Romanian side of the shore. The wind projects in Serbia have been facing challenges since the beginning, regardless the nationality of investors. These challenges were mainly related to very slow adoption and implementation of regulations and rulebooks, quite frequent change of some of the regulations,

low level of coordination with the developers and financing institutions. Still, I think it is very important to highlight that a part of our investors, Serbia would highly profit from more wind power in its portfolio. Being highly dependable on water and coal is perhaps not the safest strategy. It is enough to look just few years back when the floods paralyzed Serbian energy system. So more diversified means more free and safe future.

EP: What would be your advice about using of biomass and biogas? Can you describe in numbers and facts how it is developed in Netherlands?

G. Dool: As part of our approach to a more sustainable energy system, the Dutch are fully embracing energy from organic sources, specifically biomass, waste, biofuels, the Jatropa plant and algae. Biomass accounts for almost two-thirds of the sustainable energy currently used in the Netherlands, while the government is aiming to produce 30 percent of its energy using biomass by the year 2030. It is the simplest of all the sustainable options to integrate into energy management. Obtaining bio-energy from biomass may involve combustion, gasification, fermentation, or the production of liquid biofuels. The most important bio-energy sources are biomass additives and fuel in power plants, biofuels for motor vehicles, and energy from waste incineration plants.

Similarly, green gas comes from biomass, which refers to biological material that can be used for fuel or industrial production processes. Green gas can be generated either by fermenting biomass or through gasification, which involves expositing biomass to pure oxygen and/or steam. Gasification is suited to large-scale uses, is not only CO2 neutral, but actually extracts large amounts of CO2 from the atmosphere. The Netherlands is soon expected to be a home to some of the first large scale Zero Emission Power Production (ZEPP) plants, and here I am talking about fully climate-neutral commercial gas-fired electric power plants.

The real biomass market in Serbia does yet not exist, but I see developments in this direction which is good. Let me remind you that Serbia has way more arable land than my country and that the biomass potential is enormous. People simply have to see how it works, and I am happy to announce that very soon we are going to have a brand new cogeneration plant of about 1 Mw in village of Botos near Zrenjanin. Our government contributed financially to the development, and the plant is developed by Dutch company HOST. This project is supposed to serve as an example of successful practice where agribusiness meets energy generation, and ultimately becomes more profitable and resource efficient.

EP: What is the future of energetics in Balkans and Europe according to your opinion, since there are many challenges in field of fossil fuels and gas?

G. Dool: Diversification, cooperation, efficiency and renewable energy. I think these four elements together form the winning formula which holds for all the countries in the Balkans. The standard forms of energy generation such as coal are definitely part of that mix and I am not implying they should be closed down, but I would be good if coal extraction and combustion would be additionally modernized and less hazardous for the environment. Beyond coal there are also water, wind, biomass and natural gas. Using even 30% of the potential in each of these sectors would completely change the energy outlook of any of the countries in the Balkans.

Obviously, some countries have more potential in wind than water, or biomass than wind. More cooperation and grid connectivity would help countries to even easier balance their energy demands in short term, would provide more security and incentives to private investors, and would reinforce mutual cooperation and support in the region. So cooperation and interconnections are crucial. I am pleased to see that some steps in this direction have been made, and that countries of the region are cooperating on joint projects within and outside of the region. The Netherlands is more than willing to continue supporting Serbia on its EU integration path, especially in area of energy, sustainability and water management technologies.

Interview by: Vesna Vukajlović

SERBIA CONSUMES ONLY 1/3
of Its Potentials

During the Energy and investments fair in Novi Sad the editorial office of ENERGETSKI PORTAL had a pleasure to attend the exposition of Ms Ana Boulos, the economic counsellor at the US Embassy in Belgrade, at the conference: "Energy Prospects and Challenges". Her presentation was mostly devoted to fossil fuels, gas and the fact that Serbia depends on the import of gas from Russia, which makes Serbia energy uncertain according to her cognition. Serbia is, according to her words, in the lowest D category of energy independence. Due to this fact, we have asked Ms Boulos to tell us something more about renewable energy sources and how the United States see Serbia in this regard.

EP: Minister for Energy and mining Mr Aleksandar Antić has recently announced that the regulation which enables the use of energy from renewable sources was adopted. It is planned that the level of energy usage from renewable sources reaches 27% by 2020. How do you comment this announcement and the set deadlines?

Ana Bulos: As a part of the Energy Community, Serbia has committed itself to using 27% of final total energy consumption from renewable sources by 2020, and the current percentage is 22. For the last two years which I have spent in Belgrade, Serbia has not significantly increased the share of renewable energy in its energy system. However, I absolutely believe that this is realistic goal for Serbia, provided that the Government takes necessary steps in order to promote renewable energy. To begin with, Serbia has significant potentials for the use of renewable energy sources, but it uses only one-third of these resources. So, if the Government could support the investments in renewable energy, it would be very easy for Serbia to reach its goal by 2020, and not only to reach it but also to become a regional leader. Due to all this the Minister's statement on adoption of regulation for renewable sources is very encouraging, since this regulation will allow Serbia to develop its potential for renewable energy. When the government adopts investment friendly and sustainable model of contract for the purchase of electricity for the power plants with the installed capacity of over 50 MW, the investors in the field of renewable energy will begin to develop bigger projects in Serbia.
Another reason, due to which I believe that the goal for 2020 is possible, is because unfortunately Serbia is energy inefficient. Although the increase in production of renewable energy is important and necessary for Serbia to achieve its goals by 2020, there is

another way to achieve this goal and that is energy efficiency. Serbia consumes 2.7 times more energy per unit of energy consumption than the average country member of Organization for Economic Cooperation and Development (OECD). If Serbia would invest in energy efficiency measures such as modernization of local heating systems with the technology which is more energy efficient, of using more efficient materials and better insulation materials in buildings, than it could reduce its energy consumption and it would make a significant progress towards its goals by 2020..

EP: What is the ratio of the use of energy from renewable sources and non-renewable sources in the United States? Do you know whether there is any cooperation between the Ministry and the services in the USA and Serbia and is there exchange of experiences in the field of renewable energy sources?

Ana Bulos: In 2015, the renewable sources accounted for approximately 11 percent of total energy production in the USA, and nuclear power accounted for about 8 percent. Fossil fuels continue to represent a major part of our production and energy consumption, but when you have a look at new energy capacities in the USA, the renewable energy sources prevail.

Renewable energy takes up 68 percent of all newly installed capacities in the USA in 2015, and our CO2 emission have fallen to the lowest annual level since the mid-nineties. Our energy sector has gained an additional 8.5 GW of wind power plants and 7.3 GW of new solar power plants. The USA also records an increase in investments in renewable energy. Investments in clean energy reached $ 56 billion in 2015, thus I think we can say that investors in the USA realise that the clean renewable energy is the energy of the future.

Our Embassy has financed through USAID the exchange programmes for the Energy Agency of the Republic of Serbia. For example, in 2007 the US National Association of Regulatory Utility Commissioners (NARUC) has helped the Government of Serbia to establish the Energy Agency of the Republic of Serbia (AERS). Then, USAID helped AERS to establish a partnership with Pennsylvania's Public Utility Commission in the USA. This partnership lasted till 2011 and it helped the strengthening of AERS's capacities. In addition to exchange programmes, the USAID has been providing significant technical assistance to the Government of Serbia in the field of energy. It gave them guidelines for the increase of energy efficiency and the performance of local heating systems by switching to sustainable biomass, which reduces pollution and promotes sustainable forestry. USAID also connects two regional working groups – one for planning regional electricity transmission and the other for energy supply security – in order to develop good practices and strengthen the energy infrastructure, especially regarding the integration of renewable energy sources. EMS, EPS and AERS participate in these working groups.

EP: Do the Embassy and the USA funds support the legislation reform in the energy sector in Serbia, and in what way?

Ana Bulos: Yes, absolutely. Our Embassy has worked, again through USAID, with the Government on legislation of energy sector in Serbia. As I have already mentioned, USAID helped the Government to establish AERS. Also, our National Association of Regulatory Utility Commissioners (NARUC) supports AERS and other energy regulators in the region in identifying regulatory and legislative changes which are necessary for the liberalization of the electricity market, as it is required by the Treaty on establishing the Energy Community. Last year in January, USAID helped the Ministry of mining and energy in the analysis of model contract on the purchase of electricity from RES.

EP: Are there any plans for the investments from the USA in the renewable energy sources in Serbia, maybe in wind farms or solar power plants?

Ana Bulos: Definitely, yes. American company Continental Wind Partners (CWP) is ready to continue a project that will develop wind farm 158.4 MW as soon as the Government adopts the investment friendly and sustainable model of contract on the purchase of electrical energy from wind energy. CWP will invest over 40 million Euros and hire around 400 people for the construction of Wind Park.

CWP, together with River Power Solutions, is also interested in entering the public-private partnership with the city of Belgrade and also in other cities in Serbia, in order to produce heat by using the energy of river flow through the heat pump. CWP's heat pump would take over the energy from the river flow – from only a few degrees of heat – and it would use it as sustainable alternative to the use of natural gas. It is a very interesting technology which works in a similar way as cooling where the cold air is used for the cooling of the objects. I think this is a brilliant way for Serbia to utilize its natural resources, and it is unbelievable that such technology exists! The technology that uses cold water from the river in order to heat your own homes! Taking into account the amount of potentials that Serbia has in the field of renewable energy and that unfortunately Serbia uses only third of its own potential, I would not be surprised if many international investors including American companies would start coming here as soon as the Government adopts legislative framework which supports the investments in the field of renewable energy sources.

Interview by: Vesna Vukajlović

THERE IS AN EASY SOLUTION
Replacing Fossil Fuels with Biomass

Last year in March, UNDP presented the project 'Reducing barriers for rapid biomass market development in Serbia.' It's just one of many projects that encourage the increase of biomass participation in energy production in Serbia. It is well known data, which were also used by UNDP, that biomass accounts for 61% of the total potential of renewable energy sources. We talked to Mr Vojislav Milić about such activities and about the plan which envisages 27% of energy production from renewable energy sources by 2020. He stands for one of the most devoted activists when it comes to biomass. On behalf of the companies Foragrobio CC and Serbio he has given Energetski Portal a lot of information concerning these topics.

EP: Foragrobio is a consulting Company, while SERBIO is National Association for biomass and they strive to achieve the objectives in the field of environment. These companies have existed since 2012. Can you tell us something more about both legal entities in which you are engaged?

Vojislav Milijić: „Foragrobio CC Ltd was founded in 2012. It is specialised in providing consulting services in forestry, agriculture and biomass usage. Since the day of company's establishment till today, we have had an opportunity to collaborate with a number of primarily foreign companies engaged in different activities such as investments in forestry and agriculture, through investments in district heating plants and biomass power plants. We have also participated in development of various feasibility studies. These studies were primarily tied to specific projects which involve the use of biomass. In addition to consulting services Forgrobio CC Ltd, is recognized as a reliable partner in projects' development. More information about the company can be found on www.foragrobio.rs.

National Association for biomass SERBIO brings together companies, NGO's and experts that are in different ways involved in biomass usage or in improving of biomass usage. Currently SERBIO has 32 members and those are mainly companies which deal with biomass usage. SERBIO is active in implementation of international projects, and at the moment we are conducting BioREs project (coordinated by the Bavarian GIZ) together with 8 partners from 7 EU countries. The project is financed from the Fund Horizon 2020 of the European Commission. The aim of BioRES Project is stablishing of trade and logistics centres for wood biomass in Serbia, Bulgaria and Croatia. More information about SERBIO can be found on www.serbio.rs and about the project on www.bioresproject.eu.

EP: You have recently held a presentation at the conference, which was organized by the Delegation of German Economy in Serbia. The conference was about biogas and biomass. Would you be so kind as to bring up the most important facts, statistics and information on the use, production and resources that Serbia has?

Vojislav Milijić: You can find more details in the table which I enclose. In short, the potential of biomass in Serbia are huge, but the realization is at a low level. The fact that wood biomass in Serbia is used for the production of other products (pellets, chipboard), which are primarily assigned to export, is a particular problem. On the other hand, we import fossil fuels and export products based on biomass, instead of using those products locally and thus reduce energy dependence. Also, huge amounts of biomass are used very inefficiently (as firewood), which again reduces potential amounts that could be used more efficient (in CHP or district heating plants). Due to all these reasons we have a situation in which the production of wood biomass is rather limited, since the large quantities have already been used. An additional problem is the lack of organization of the private forest sector which owns over 50% of forest resources. These forest resources are mainly used in an unplanned way and under the pressure of the unfavourable economic situation.

SERBIO
NACIONALNA ASOCIJACIJA ZA BIOMASU

Forest coverage (M ha)	2.25
Forestry (%)	29
Timber volume (M m^3)	362.49
Average volume (m^3/ha)	161
Annual growth (M m^3)	9.08
Average growth rate (m^3/ha)	4
High forest surface area/ volume (%)	27/43
Coppice forest surface area/ volume (%)	65/50
Plantation surface area/volume (%)	8/7
Conifers (%)	19
Deciduous (%)	81
State surface area/volume (%)	53/61
Private surface area/volume (%)	47/39
Annual woodcutting (M m^3)	4.6
Technique/ firewood/ residue (%)	43/45/12

The production of agricultural biomass is very low compared to its potential. There are significant possibilities for its growth. Nevertheless, the use of agricultural biomass is specific and it requires a special logistics concept and a large storage area, which represents a particular challenge for investors.

THE MOST IMPORTANT OPPORTUNITIES FOR THE USAGE OF BIOMASS IN SERBIA ARE:

- Energy crops, especially willows and poplars on land which do not provide adequate yield as traditional crops
- Pellet production, but only if there is a guaranteed sale, because the competition is extremely large in both domestic and foreign market, and the use of it is decreasing in most countries of Western Europe
- Heating plants on wood or on agricultural biomass through the Public-Private Partnership model or through the investments of the local governments
- Power plants of CHP plants on agricultural biomass used primarily for the energy production in industrial zones

EP: Is it possible to increase the percentage of biomass usage at a local level? What suggestions would you make?

Vojislav Milijić: Yes, and it would be very simple. You just need to replace fossil fuels with biomass. More than 20 municipalities in Serbia are currently working on the development of biomass power plants and they are at different stages, but I think that we can expect the first operating power plants on wood biomass next year. These projects were developed with the support of German Development Bank (KfW), and some of those with the support of GIZ DKTI projects or the support of other institutions. I remind you that one of the heating plant in Sremska Mitrovica has already been using agricultural biomass (sunflower husk). As far as the fuel cost is concerned, biomass is competitive in relation to crude oil and natural gas, and it does not pollute the environment as coal. The most common obstacles for local utility companies are investments in biomass boilers, but still in addition to KfW soft loans, there is a possibility as well as the interest of the investors in public-private partnership. The private partners would be the holders of the investment for the energy production, while the public partner would carry out distribution in these partnerships. To some extent the obstacle is also the current decline of oil prices and thus the heavy oil, which is the reason why the decision on the replacement of fuel and introduction of biomass in heat production system is delayed. However, I think that this is only temporary postponement because even with these prices, biomass is more cost effective option in long-term, which unlike other imported fossil fuels provides opportunities for development of local communities.

EP: The Statute of SERBIO Association says that the objectives for the development of bioenergy sector market are raising of the awareness, strengthening of Public-Private Partnerships, organizing workshops and conferences. What is your experience and do you manage to achieve visible results in all these fields? What would be your observations and remarks? Where do you see progress?

Vojislav Milijič: I personally have been dealing with the use of biomass since 2009 and if I was to compare the situation then and now, I would say that Serbia has made a huge progress especially when it comes to raising awareness. A series of events (conferences, fairs, etc.), on which the biomass usage is one of the topics in addition to other renewable energy resources, tell us how topical biomass actually is. Our association SERBIO has made a contribution to this progress in addition to other organizations (GIZ DKTI, UNDP and others). Things in which Serbia generally legs behind, not only Western Europe but also the nearest neighbours are the concrete projects of energy production based on biomass, as well as the increase of energy efficiency while using biomass. Still I think we will see the first results in the near future in these fields also, in the first place because Serbia has professional, technical and financial capacities for the implementation of such projects.

Interview by: Vesna Vukajlović

STRENGTHEN THE CAPACITIES FOR THE USE OF BIOENERGY IN SERBIA

Ms Milica Vukadinović emphasizes the cooperation with the Municipality of Pirot, which will provide heating on woody biomass in public buildings with a help of public-private partnership.

Delegation of German Economy in Serbia organized a conference entitled 'Biomass and Biogas in Serbia' at the beginning of April in Belgrade. A number of interested companies from Germany held a presentation in order to establish cooperation and partnership in Serbia. Many Executive Managers and owners of the companies arrived in Belgrade ('Vecoplan'. 'New Eco-tech Verfahtenstechnik', 'Strawtherm', 'AP Bioenergietechnik' and many others). However, the exposition of Milica Vukadinović dragged our attention. She is "Project Development" Component leader for the programme "Development of a Sustainable Bioenergy Market in Serbia" (DKTI) of GIZ. The aim of this presentation was to present the activities and cooperation with Serbian cities and municipalities. We were acquainted with plans that should improve the standard at the local level and the quality of life on farms, in rural households, schools, hospitals, etc.

EP: Would you be so kind to tell us something about the programme "Development of a Sustainable Bioenergy Market in Serbia" (GIZ DKTI) which focuses on the prospects and challenges in developing bioenergy market in Serbia? What are the timelines of this project and what does GIZ conduct within this project?

Milica Vukadinović: The programme "Development of a Sustainable Bioenergy Market in Serbia" is a bilateral programme between the Republic of Serbia and the Federal Republic of Germany. The programme is implemented in cooperation with the Ministry of Agriculture and Environmental Protection and The Ministry of Mining and Energy of the Republic of Serbia. The programme lasts till the end of 2017.

The main objective of the programme is to strengthen the capacities and to create favourable environment for the sustainable usage of bioenergy in Serbia in different fields.

FIELDS OF THE PROJECT ARE THE FOLLOWING:

- *Policy advice* - improvement of framework conditions for bioenergy sector and adjustment of regulations and standards
- *Biomass supply* - development of local structures for heat power plant's provision of biomass such as wood residues (production or collection, processing, transportation, storage)

- *Efficient firewood utilization in households* - promoting efficient utilization of wood fuels in households, as well as the introduction of standards for more efficient furnace
- *Project Development* - helping Serbian and German investors in developing and implementing various types of innovative projects in the field of bioenergy (for example heating system on wood biomass in public buildings, biogas power plants, power plants for the production of heat for industrial purposes)

In concrete terms, the field of Project Development, which is in the framework of GIZ DKTI project, has been focused on the development of small and medium-sized biogas power plants this year.

Germany is the leader in the field of biogas and there are over 9,000 biogas power plants with total installed power of over 4,500 MWh. Serbia has only three functional biogas power plants, which have been operating since 2013.

However, the introduction of biogas power plants on medium sized farms in Serbia would create additional constant incomes to farmers and agricultural households and more important it would reduce the negative impacts of fluctuations of other income of the farms.

Small biogas power plants on farms imply the installation of technology

which uses raw materials that farmers already have and that is free. This raw material is organic waste such as animal manure from which biogas can be produced. Biogas can be used for the production of heat for the farms' needs, but also for the production of electricity which can be sold at pre-defined incentive prices (so-called 'feed-in' tariffs) and in that way farmers can earn additional income.

By using electricity from renewable energy sources, Serbia is moving towards the environmental standards of the European Union; achieves increased revenue at the local level, and agricultural households gain energy independence, which can have a major role in doing business and development planning in the future. Domestic farmers have shown huge interest in new technologies which we have been promoting as an organization and we hope that we will have an opportunity to talk to Serbian farmers about the prosperity and the benefits which biogas yields has brought to them in the years ahead of us.

EP: What is your experience regarding the cooperation with local governments? Which municipalities and cities have been included in your projects in the field of bioenergy? What has been achieved so far?

Milica Vukadinović: We would particularly want to highlight the excellent cooperation with local self-governments, engagingness of people and their readiness for changes which lead to better standard of living, sustainable development, economic development of municipalities and environmental protection.

I will single out the cooperation with the Municipality of Pirot, which will through public-private partnership soon provide heating on wood biomass in public buildings (schools and kindergartens) in their city. Then, we conduct campaigns together we the Municipalities of Leskovac, Vlasotince, Bajina Bašta and Užice for the promotion of more efficient usage of firewood. The municipalities in the southwest Serbia in Zlatibor District (Bajina Bašta, Nova Varoš, Prijepolje, Priboj, Mali Zvornik, Novi Pazar) have made joint efforts and shown willingness to switch from heating on fossil fuels onto locally available and CO2 neutral energy source – wood chips.

EP: What is the situation regarding the use of wood biomass for energy purposes in the region? Can you compare the progress of Serbia in relation to other neighbouring countries?

Milica Vukadinović: Serbia has a huge biomass potential for electricity production in agriculture and forestry. The aim of Serbian Government is to make this potential accessible and thereby help the increase of the energy share from renewable energy sources. Heating power plants, industrial power plants and agricultural households show the increased interest for the use of bioenergy for heat and electricity. The efforts that GIZ makes in the development of bioenergy market in Serbia are of huge significance for the entire Balkan region. Our goal is not just the exchange of existing knowledge and good practices between Serbia and Germany but also between regional actors in this field. This contributes to the local economic strengthening, additional employment and significant positive impact on the environment. It is very important to point out that the sustainable usage of bioenergy requires an organised and systematic approach of actors in different sectors and at all levels.

EP:Cooperation between Germany and Serbia is long-term and includes all professions. What are the GIZ's plans for the future period in Serbia in the field of bioenergy?

Milica Vukadinović: Cooperation between Serbia and Germany is exceptional in many areas and we are proud of our partnership because it creates real values for the citizens of Serbia. Development potentials of Serbian agriculture are extraordinary, since Serbia has significant resources. We pay much attention to this area. The German Agency for International Cooperation is very dedicated to agricultural development through the usage of bioenergy. Currently, domestic farmers rely on traditional energy sources to a great extent, which are expensive and have harmful impact on the environment. Energy independence, improvement of your business and achievement of additional revenues can be achieved with the adoption of new technological solutions and with turning towards the production of bio-energy.

Interview by: Vesna Vukajlović

GERMANY IS THE WORLD LEADER
in Technologies for RES Usage

Serbia has done a lot to improve the implementation of RES, primarily through the adaptation of feed-in tariffs for the purchase of electricity from renewable energy sources. The people who lead Serbian agriculture and industry more and more recognize the possibilities of using our own energy resources for the production of electricity and heat.

The German-Serbian Chamber of Commerce was recently established, and it is headed by Mr Martin Knapp, the Executive Manager. He has been living and working in Belgrade for a long time. In his previous interviews we could read that German companies employ around 25,000 workers in Serbia. We could also find out that German economy rests on medium-sized companies that arise from small. Mr Knapp thinks that it is very eminent to stimulate the establishment of small companies in Serbia, but in the branches in which there is a possibility for them to develop into medium-sized companies. ENERGETSKI PORTAL has asked him to tell us how he sees the cooperation between these two countries in the field of renewable energy sources as well as to tell us how the companies can accomplish the cooperation. It is very important to emphasise that the establishment of the Chamber of Commerce represents the message for German business community that Serbia is reliable economic partner and that the reform processes are finalizing.

EP:The delegation of German economy in Serbia, German-Serbian Business Association and DEinternational have recently registered as the German-Serbian Chamber of Commerce. Will there be any specific changes? What can we expect now since you will operate as a Chamber of Commerce in terms of cooperation with public institutions and Serbian companies since 2016 is proclaimed to be the year of small and medium companies?

Martin Knapp: With the establishment of German-Serbian Chamber of Commerce (AHK Serbia) we have managed to officially institutionalise our business and economic cooperation, which we have been building for a decade through the Delegation of German economy in Serbia (AHK), the company for providing services DEinternational Ltd, and German-Serbian Business Association (DSW). Previous activities within the framework of all three institutions remain unchanged but with the difference that we will be able to represent the interests more efficiently and to be the spokesmen of the businessmen who operate in Serbia due to the new company and direct cooperation with Serbian institutions. We will also be at service to public institutions and we can present them the options for better organisation and advancement of certain things. The chamber will deal with the implementation of important projects concerning practice in the companies, programmes which enable Serbian companies to be the suppliers of German economy. Since 2016 is Year of Entrepreneurship among the others ideas of the Chamber is to introduce dual education in cooperation with other companies. Also, the official establishment of the Chamber is a strong message to German business community that Serbia is a reliable and stabile business partner.

EP: You have over 300 members. Would you be so kind as to tell us something more about the companies in the field of energy, renewable energy sources and sustainable development? What companies are those? What are their activities? Do they have plans to invest in Serbia? What are your plans for the future and what is your opinion of Serbia as a market?

Martin Knapp: Members of the chamber in the field of energy, renewable energy sources are engineering offices, consultants and representatives of the German equipment manufacturer in Serbia. The use of renewable energy sources is growing in Serbia and therefore the market for the appropriate products and services for the members of our Chamber. The same goes for the products and services, which aim to improve of energy efficiency of the buildings and industrial processes.

EP: You have organized a series of conferences in the field of energy efficiency, biogas, biomass and etc. We have heard that Germany is planning to switch to renewable energy sources and to reduce foreign dependency on energy sources. What is your opinion on this matter?

Martin Knapp: Germany is a world leader in technologies for renewable energy sources and energy efficiency. The final goal is to come to renewable and sustainable energy sources, and to reduce the energy consumption in all economy sectors and society – from the buildings to industry, transport and infrastructure. The main obstacle is still a low price of conventional energy sources.

EP: Can Serbia come closer to Germany with the implementation of renewable energy sources in agriculture, industry and local self-government?

Martin Knapp: Serbia has done a lot to improve the implementation of renewable energy sources, first of all the adaptation of feed-in tariffs for the purchase of electricity form RES. Serbian agriculture and industry increasingly recognises the possibilities of using their own energy sources for the production of electricity and heat, which are generated in the production process (for example wood, manure, agricultural residues, etc.). A lot has been done on energy recovery of the buildings in local self-governments. Implementation of the adequate technologies is still far behind German level, but it is constantly growing.

Interview by: Vesna Vukajlović

News / MIX PRESS

RECORD 46% OF UK'S ELECTRICITY GENERATED BY CLEAN ENERGY SOURCES IN 2015

Almost half the UK's electricity came from clean energy sources such as wind and nuclear power last year, official figures have revealed.Renewables accounted for a quarter of the country's power supplies in 2015, outstripping coal power for the first time, the data published by the government revealed.

In total, low-carbon power sources, which produce little in the way of greenhouse gas emissions, supplied a record 46% of the UK's electricity in 2015, as the amount of renewables grew and nuclear generation rose after outages in late 2014.Coal supplied just over a fifth (22%) of power in 2015, down from 30% in 2014, while gas continued to provide around 30% of the UK's electricity.Nuclear power's contribution rose slightly from 19% in 2014 to 21% last year, the figures from the Department for Business, Energy and Industrial Strategy showed. The amount of onshore and offshore wind turbines and solar panels increased, while higher wind speeds and more rainfall boosted hydropower – helping to generate more clean energy.

And the UK's biggest coal-fired power station, Drax, in North Yorkshire, switched another unit from coal to mostly burning biomass – most of which is wood pellets.Overall, renewable sources – which include onshore and offshore wind, solar farms, hydroelectric dams and biomass – accounted for 25% of the UK's electricity generation.The total amount of generation capacity was down as several power stations closed, but some of the fall was offset by new renewables.The government wants to phase out polluting coal-fired power stations by 2025 as part of efforts to tackle climate change, but only if new gas plants can be built to meet demand.Industry body RenewableUK's deputy chief executive, Maf Smith, said: "The Government took the right decision when it announced the phasing out of coal."Now we can see renewable energy filling the gap, replacing old technology with new. 2015 was the first year that renewables outperformed coal."A quarter of Britain's power is now coming from wind, wave and tidal power and other renewable energy sources."Renewables are now part of our energy mainstream, helping us modernise the way we keep the lights on by building new infrastructure for the generations to come."Across all energy use – including power, heating and transport – renewables accounted for 8.3% of consumption, up from 7.1% in 2014.The UK has a target under European Union rules to source 15% of its energy from renewables by 2020.

Source: theguardian.com

THE AMERICAN HIGHWAY: A NEW SOURCE OF SOLAR ENERGY

Route 66 crosses 3,940 km of the continental USA, stretching from California to Illinois, and for one ambitious startup, this famous road is an ideal source of clean energy.

Based in Idaho, Solar Roadways was founded in 2006 by husband and wife team Julie and Scott Brusaw, who have spent more than a decade working on technology that replaces traditional carriageway surfaces with solar panels. Their project involves paving a section of the highway, once dubbed 'the main street of America', with these large, thick hexagon-shaped installations, built to hold up under all weather, and strong enough to handle a load capacity of 110,000 kg.

Amongst the solar panels' innovative features is their capability to heat a road to keep its surface free of ice and snow. The location for the initiative is near the Route 66 Welcome Centre in Conway, Missouri and the project is supported by the state's Department of Transportation.

Solar Roadways believe their technology is sturdy, durable, efficient, and they foresee the application as a smart grid (an electricity supply network that can sensor usage and respond to needs as required). Built to last an estimated 20 years, the panels are intended to duplicate the performance characteristics of highway asphalt, concerning being able to maintain traction for any number of vehicles and sustain high-impact incidence. Prototype panels have the texture to stop a vehicle travelling at 129 kms an hour on a wet surface within an acceptable distance. Unlike asphalt or bitumen, the panels do not soften under high temperature.

The Brusaws are convinced that Solar Roadways is the ideal solution to the energy needs of the USA. If rolled out across the country in all possible configurations from roads to exterior parking lots, they believe that the panels would create 13,385 billion kWh of electricity – far more than the country uses in a year. Estimates of how much energy a single panel generates is contingent on a number of factors including the season of the year, actual geographic location, and microclimatic factors.The stakeholders hope to realise funding of the project with a combination of government grants and crowdsourcing.The technology, which has been criticised as expensive and a poor performer compared to other solar technologies, has a brief but notable recent history.In 2014, a 70 metre 'solar' bike path became operable in The Netherlands and reports indicate that it has successfully generated 3,000 kWh in six months. In February, the French government announced a plan to power street lighting for a township 5,000 using solar panel paving technology laid out over 1 km of road.
This would be the pilot project that would ultimately see 1,000 km of the country's roads using the technology over the next five years.

Source: techexec.com.au

WORLD'S FIRST 24/7 SOLAR POWER PLANT POWERS 75,000 HOMES

SolarReserve's Crescent Dunes Project in Tonopah, Nevada is quietly providing clean, green solar energy to 75,000 homes in the Silver State even when the sun isn't shining. Crescent Dunes is the first utility-scale facility in the world to use molten salt for power energy storage capabilities, a technology also known as concentrated solar. With a concentrated solar plant such as Crescent Dunes—including other plants like it around the world—more than 10,000 movable mirrors, or heliostats, reflect solar energy to a central, 640-foot tower that heats up salt to 1,050 degrees Fahrenheit.
This salt is used for two purposes, as SolarReserve points out on its website. First, it retains very high levels of heat, making it like a thermal battery that can be used night and day, whether or not the sun is out. Second, when electricity is needed on the grid, the molten salt gets dispatched through a heat exchanger to create super-heated steam to power a traditional steam turbine. This process is similar to a conventional fossil fuel or nuclear power plant except with zero carbon emissions or hazardous waste and without any fuel costs, the California-based solar company says."The whole project cost slightly under $1 billion and SolarReserve holds a 25-year contract to supply power to NV Energy for $135 per megawatt hour," OilPrice.com observed. "The tower produces 110 megawatts of energy for 12 hours a day according to the company, which works out to roughly 1 million megawatts per year. This in turn implies a gross [return on assets] of ~13.5 percent—not bad as investments go."
The method is different compared to photovoltaic technology, which harnesses the sun's rays on panels that convert sunlight into electricity. While photovoltaic arrays have many benefits and the technology has been well-tested and proven, its biggest problem is when the sun is not out. As EcoWatch mentioned previously, a solar system's peak generation hours do not coincide with the utility's peak load hours after 5 p.m., meaning power companies turn to high-carbon peaking turbines in the evenings, thus decreasing the environmental benefits of solar panels. "The plant is noteworthy for what it accomplishes—it is the first truly 24-7 solar plant in the world. For many applications that is a very big deal," OilPrice.com adds about the Crescent Dunes project. "Having to build a second power plant to back up a solar array is not an ideal solution to say the least. Thermal solar resolves that issue all while letting facilities like SolarReserve's store 1,100 megawatt-hours of energy." Residential or grid-scale battery systems, such as the ones manufactured by Tesla, are an another emerging solution to solar storage issues but the technology is relatively new.
Solar thermal plants are setting up in sun-spoiled deserts around the world. The Ivanpah Solar Electric Generating System in the California Mojave Desert is the largest concentrated solar plant in the U.S., spanning 3,500 acres and has 377 megawatts of net generating capacity. The facility, however, is experiencing widely reported "engineering hiccups," including a fire that broke out in May. Dubai's massive Mohammed bin Rashid Al Maktoum Solar Park is another notable concentrated solar plant that will hold the distinction of being the world's largest once it's operational in April 2017. The facility aims to produce 1,000 megawatts by 2020 and 5,000 megawatts by 2030. The solar park also broke the record of having the world's cheapest solar on May 1 when five international companies bid as little as 2.99 cents per kilowatt-hour to develop the plant's latest phase of work.Besides Crescent Dunes, SolarReserve is developing two other concentrated solar plants. The venture is building the Redstone Solar Thermal Power Project in the town of Postmasburg in South Africa, which will be the first concentrated solar plant in Africa. The other is the Copiapó Solar Energy Project in Chile which will combine both concentrated solar and photovoltaics, making it the first facility of its kind in the South American country.

Sandra Jovićević / foto: naslovi.net

MARKET SHARE
is Certainly Bigger than 50%

Erste bank has supported over 40 projects in the field of renewable energy resources, and funded over 50 million euros in the power plants with total installed capacity of 35 MW. The bank makes decisions independently for small projects, but for bigger installations they consult colleagues from the Group who have rich experience gained throughout Europe.

There are no small electricity suppliers, small power plants or biogas power plants without the support of financial institutions. This was also confirmed by the owners of power plants with comments that the government needs to provide good legal framework. The following important decision of the investor is to choose with which bank he wants to cooperate depending on the conditions which he obtains from the bank. Majority of financial institutions are a part of a network or a branch office of a foreign bank so they dispose with experience of other countries and trained staff that are prepared for many challenges. One of the most common is insufficiently developed project, not worthy of support and it is rejected by the bank. During the conversation with Mr. Aleksandar Savić, Manager of the Direction for public sector operations and special funding, Business Sector for MSP and the Public Sector in Erste Bank, we have realised how one bank can have a very high market share and be among the most successful ones.

EP: Erste Bank has invested over million euros in RES so far and the total installed power of RES funded by Erste Bank is 35 MW (22 hydropower plants, 3 biogas power plants, 14 solar power plants and 1 Wind Park). What is the period in which the bank invested funds into these projects? What would be the share of Erste Bank on our market? Would you be so kind as to tell us something more about the implemented projects?

Aleksandar Savić: Up to this point, Erste Bank has funded RES projects in the amount of over 50 million euros and therefore we have supported more than 40 projects whose installed capacity is 35 M. So far Erste Bank has funded 22 projects of mini hydropower plants, 3 biogas power plants, 14 photovoltaic plants (1 on the ground and 13 on the facilities) and the first wind farm in Serbia (9.9 MW)

The first project was funded in 2010, and the intensity of financing grew over the years. Although there are no precise data, we can

praise about being absolute leader in domestic market in terms of financing RES projects; it is also estimated that the market share (financed by the bank) is certainly higher than 50%.

A large number of projects which we have financed are already in operational stage, thus we had the opportunity to get to know with all the phases of these projects, from designing through construction to operational functioning at first hand. Bearing in mind that these investments are funded on the principles of project financing, we have been informed about the details and we have closely followed all these stages. In addition to providing financial services and the loan we have also provided our clients with the know-how we possess, which is not negligible having in mind the number of projects in our portfolio.

EP: Have you allocated the funds for RES for the future period? Will the funded projects have a different ratio in your opinion?

Aleksandar Savić: We try really hard to ensure the best possible long-term funds for financing of these projects at any time. Currently, there are no restrictions concerning the availability of such funds. As far as the ratio of funded projects is concerned, we definitely expect a large number of new SHP projects which we will fund. Bearing in mind untapped potential,

we also expect greater activity in the field of implementation of biogas stations' projects. For example, Czech Republic, which can be compared to Serbia regarding bio-resources, has more than 500 such power plants while in Serbia there are only 5. Of course, the implementation of these projects is conditioned by the adaptation of by-laws that has been expected since the end of the last year. These by-laws should enable greater activity in the field of wind power, but the approach to financing of these projects is a bit different since we have to deal with a small number of very big projects.

As far as the solar (photovoltaic) power plants are concerned, we do not expect any significant activity. First of all, due to very small quotas and the other reason is that the proposed new feed-in tariffs for this type of projects are not so stimulating. Despite the fact that this technology has become considerably cheaper in the last few years, the characteristics of the local area are such that the feed-in tariffs for the purchase of electricity for these projects need to be two or even more times higher compared to, for example, the small hydropower plants in order to enable the return of the investment in the equal period. The main problem for the implementation of geothermal energy is very expensive research projects, and they cannot be, due to high risk and uncertainty, funded by the bank loans.

EP: How much money was allocated? How long does the period of data processing last when the clients submit all documentation?

Aleksandar Savić: We want to provide best long-term funds for financing these projects at any time, and thus we always have enough of resources at disposal. Currently, we are even able to offer a certain amount of funds with 'grant' component, which means that for a limited number of projects we can offer a certain amount of non-refundable funds. The time period for the processing of a request depends on the complexity of the request, but the most common processing time ranges from two weeks to a month.

EP: Does Erste Bank independently makes decisions on the projects that will be financed at the local level or in coordination with the central office?

Aleksandar Savić: Decisions are made at the local level for majority of projects. When we talk about bigger projects than we include the colleagues from the Group with whom we share acquired experience and knowledge.

Interview by: Vesna Vukajlović

SOLAR WORLD RECORD
on the Tissot Arena in Biel, Switzerland

The world's largest in-stadium solar power plant has been built on the roof of the Tissot Arena in Biel. Its capacity: 2.1 MW driven by 62 ABB TRIO inverters.

Interestingly, this kind of milestone project was discussed for possible development in Zurich but Biel was able to bring it to fruition. The Tissot-Arena is a multifunctional sports arena for soccer and hockey. In addition, the facility contains a curling arena, a covered public space, restaurants, stores, and a multiplex cinema.

Biel as a self-declared "energy city" is committed to a sustainable energy policy. The Energie Service Biel/Bienne (ESB), is the leading energy service provider in the Biel region.The ESB has been independent since 2013, but is still owned by the city of Biel as a community venture. It strives to promote the use of renewable energy and to contribute to the change in energy policy and generation.

The power plant on top of the Tissot-Arena not only significantly increases the power produced from renewable energies for ESB, but the installation is also the largest solar power plant integrated into a sport stadium globally – hence, it is a showcase project for the use of solar energy throughout Switzerland. The average annual production is expected to be roughly two gigawatt hours: the installed capacity is 2,106 kilowatt peak (kWp).

The enormous sports complex features an extended roof which has approximately 16,500 square meters of space available for the solar modules – a total size of two soccer fields. "It was quickly clear to us that we wanted to use this space on top of the stadium for a solar power plant since it had very little shading," said Davide Crotta, project lead renewable energies at Energie Service Biel/Bienne (ESB).

The roof-top solar plant was connected to the grid in June 2015. The expected annual energy production will equal the consumption of approximately 500 average Swiss households. "There are now two staircases to the roof-top, so we can show the solar power plant to interested parties up close," said Cotta. As impressive as the Tissot-Arena is from the outside – it shows its sustainable "sunny side" best when viewed from above.

The project on the Biel stadium was developed by Helion Solar. "This has been one of the biggest solar power plants we have ever built," said Remo Nyffenegger, head of marketing at Helion Solar. Helion Solar offered a decentralized solution with 62 ABB TRIO 27.6 kW inverters. "We have been using ABB inverters for some time now and our experience has always been very positive," said Nyffenegger. In addition to their proven reliability, high efficiency up to 98.2 percent and broad input voltage range, the TRIO inverters were selected because of their two independent MPPT (Maximum Power Point Tracker) per inverter which guarantee optimal energy output in the case of multiple strings with different orientations and angles.

Pricing was only one of several criteria in the tender. Sustainability, productivity, and references were also important as well as system design. "We also looked at the option of installing a central inverter on the roof," said Crotta. "However, the decentralized design using multiple TRIO inverters offers specific benefits. It is more robust with regard to servicing the inverters as it is a substantial effort to repair or replace a central inverter in case of malfunction. In addition, the direct current cabling is much less complex with a decentralized solution."

ABOUT ABB

ABB (www.abb.com) is a leader in power and automation technologies that enable utility, industry, and transport and infrastructure customers to improve their performance while lowering environmental impact. The ABB Group of companies operates in roughly 100 countries and employs about 140,000 people.

ABOUT HELION SOLAR

Helion Solar is the Swiss market leader with regard to the planning, implementation and maintenance of photovoltaics and energy storage plants. Helion Solar is headquartered in Luterbach, and has nine subsidiaries in Switzerland. Since 2015, Helion Solar has been part of Alpiq.

ABOUT ESB

ESB is the leading energy service provider in the Biel region. Energie Service Biel / Bienne provides its customers with energy, natural gas, and water. ESB is invested in renewable energy, including hydro power, solar energy, and biogas.

NEW GENERATION AUTOMATIC RECLOSERS

Unique Protection of Medium Voltage Networks

TeleGroup is an exclusive distributor of automatic reclosers of the Australian brand NOJA Power and provides unique devices in their class in terms of high reliability of transmission and distribution networks and highly efficient localisation of network faults at the regional market.

What is a medium voltage recloser and what is its purpose?

First of all, it is necessary to explain voltage levels and at which voltages an automatic recloser is installed. Medium voltage is used directly by industry and by "small" consumers (households) indirectly after the transformation to the 0.4 kV voltage level. Therefore, electricity that is supplied and transmitted by distribution companies all over the world varies from 10 to 35 kV. It is necessary to transmit this electricity securely and to have certain points of measurement of many important characteristics, as well as of a two-way communication. The main role of an automatic recloser is to ensure the most efficient supply of electricity to consumers in case of network failure that has caused delays in electricity supply and to detect faults in the most efficient way with minimum required time and to provide power supply to consumers who have been left without electricity. For the purpose of unobstructed and absolutely controlled provision of services, a transmission and distribution company should deploy in its systems advanced solutions such as automatic reclosers in order to meet the requirements of suppliers. In our case, this is OSM NOJA Power Automatic Recloser.

Nowadays, the energy does not only flow from one source (energy generation) to consumers but more often, consumers themselves become sources of energy (mini power plants, hydro, solar, wind and etc.) which is sold through a distribution network onto the market. In this respect, the use of reclosers is significantly increased and, among other things, this has been shown in the world statistics of investments in the medium voltage networks in the last five years. The exponential growth is just a picture of what is inevitable. Each growth needs control, governance and security, which is inevitably given by NOJA Power Automatic Circuit Reclosers.

Why a NOJA power automatic recloser?

In addition to all obvious advantages, technical advantages over similar products in the same class are great. Starting from 30,000 manipulations under full load, through dimensions themselves, which are very important for the application of reclosers on the poles of the overhead network, to materials and IP protection degrees of the parts of reclosers, we come to one of the most important advantages, and this is full support for the installation and connection to SCADA systems, as well

as services provided by TeleGroup as an exclusive distributor of the Company NOJA Power at the territories of Serbia, Bosnia and Herzegovina, Macedonia, Albania and Montenegro.

Patents and certificates that NOJA Power has proved constant investments in innovations and the creation of new ways to improve security for both the citizens and the personnel of the grid maintenance who is in direct contact with reclosers. All about the advantages of automatic reclosers can be found on our web portal.

SAFETY ABOVE ALL

Remote control and automatic reclosers control through Android/iOS applications

In addition to an innovative patent for safe discharge, which is the unique patent of this kind applied in the production of medium voltage reclosers, NOJA Power has gone one step further in time and in line with modern trends, it has created an application, which is not only useful in daily operations but also especially useful in accidents, where there it is impossible to physically access an RC management block itself due to possible parts under voltage. Thus, in front of you on your tablet or your telephone, there is an identical display as on a LCD panel in a RC recloser control cabinet itself and the availability of all functions is guaranteed after security checks and log-in for a specific device, that is, a specific recloser which we want to access.

What problems are solved?

If your distribution company for overhead lines has real time automatic reclosers, it will have complete monitoring and possibilities for remote control of power supply to consumers in the region. In case of supply failures, the main feature of an automatic recloser is to ensure in a short period of time (shorter than a bulb blink) the supply of an alternative source and thus enable continuous power supply!

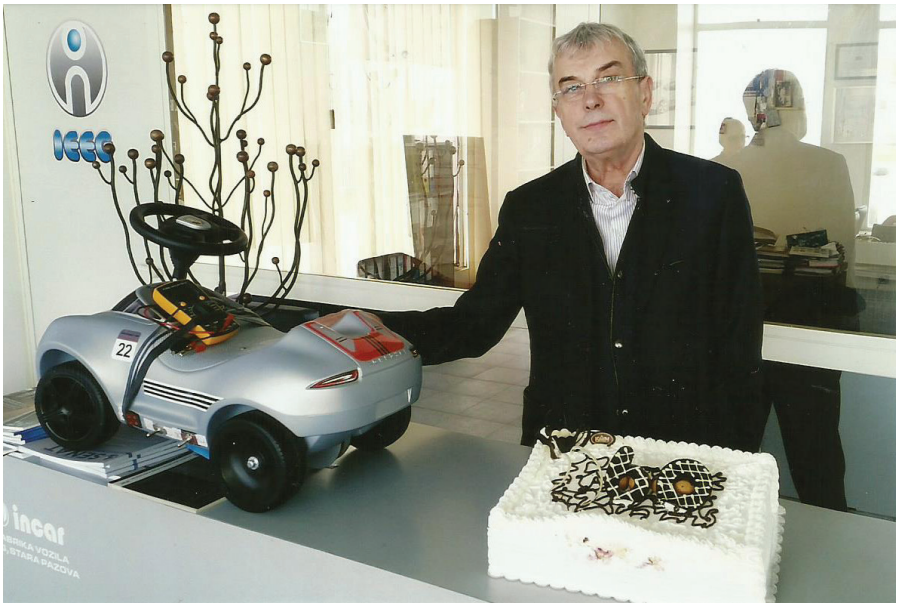
Please contact us for further information.

www.telegroup.rs

ELECTRIC CAR
Created in IEEG Energy Centre

Electric cars were popular at the end of the 19th and the beginning of the 20th century, but they were suppressed by the engines with internal combustion. The energy crisis during 1970's and 80's led to short-term interest for electric cars. People renewed interest in electric cars in the mid 2000's mainly due to the concerns about fast increase of oil prices and the need to reduce emissions of exhaust gases. IEEG, Energy centre of the Institute for clean technology and energy efficiency in Stara Pazova aims at the development and implementation of green economy projects. This is the reason why we visited this centre and talked to Mr. Slavko Vujović, the executive manager of the Institute whose leading innovative project is electric car.

Slavko Vujović: Innovative concepts of managing resources and technologies help transformation of economy and encourage the sustainable managing resources. In this way green business with sustainable business models play the key role and transformation drive in the 21st century. The best example of merging with concepts of cleaner production, eco design and 100% of zero emission is the project of Serbian electric car which is being developed by IEEG and the Institute of Eco economy in cooperation with German Ifas Institute. The promotion of this electrical vehicle, precisely of the mini car, IEEG had at the car fair in March this year, and Energetski Portal wrote about this in order to support pioneer efforts for the production of domestic electric car. It is important to highlight that this centre is included in the Horizon 2020 projects. Horizon 2020 is the biggest programme of the European Union for the research and innovations, whose fund is 78 billion Euros and is



available in the following seven years. After the Republic of Serbia had involved in Horizon 2020 on 1st July 2014, these funds became available to domestic scientists, businessmen and civil sector.

EP: Is there anything else that you have been working on in your development centre? What ambitions do you have for wider community?

Slavko Vujović: We are working on three projects in the field of green economy in our development centre: Energy + IEEG adaptation and investment plan – Call (EE-2015-4PDA): Energy efficiency, Bio Waste for Building Insulation and Energy (BoWie) in the field of energy efficiency in buildings, then WASTE–6a –2015 Eco Innovative solutions which refers to the communal waste and biomass. These projects have entered in the second phase of development for financing from the EU funds Horizon 2020. The projects are aimed at sustainable economic concept, development and implementation of new technologies. Their focuses are also smart grids, storage and the system of technology integration with the increase of RES share. Our goal is not only to drive this electric car in urban city conditions but also to find an implementation in public utility companies.

EP: In which way have you organized your Institute? What goals have you set and are they cost-effective and understandable to the wider public?

Slavko Vujović: Development and elaboration of scientific research laboratory for training and management, monitoring system, consumption analyses and energy savings is the living proof and the best example of the implementation of concrete technical solutions and implementation of projects' assignments. Special emphasis is placed on educational-scientific principle in terms of transferring of professional experience and knowledge. This is the channel through which we want to include broader and professional public into our work. We are planning to organise professional lectures, seminars and educative programmes in the Institute in order to give students and future experts a chance absorb the knowledge of our experts.

EP: Let's go back to the electric

car which you are known for. What stage has the project reached, after the promotion at the car fair and what is the future of this idea?

Slavko Vujović: Functional demonstrative model should serve for the examination of engine behaviour and for checking the car's performances as well as the quality of the battery. In this way, it will be possible to examine the performances enabled by the battery and the designed engine, with of course minor modifications as well as the possibility of recognizing possible problems during the project's implementation. After the performed test we will start the construction of a domestic vehicle. The components which will be installed in the vehicle will have superior performances and will be connected in a suitable way in order to achieve the best results. The arrangement of the components in the model depends on the functionality, balance and design of the model itself. It is very important to highlight that the components of the electric car model are designed in such way to demonstrate and present energy saving with the solution that is the work of our team of electro-energy laboratory IEEG. The benefits of the electric car compared to the one with internal combustion engine are: maintenance costs and environmental protection which is the most important point for the future of the humanity from a moral aspect.

Interview by: Vesna Vukajlovi

INNOVATIVE PRODUCTION
in Car Industry

The IEEG company policy is based and insists on raising awareness about economic, social, environmental and institutional sustainability. The aim of IEEG is a constant economic growth, technological progress, the introduction of cleaner technology solutions, innovation of the entire society and corporate social responsibility that will ensure long-term poverty reduction, pollution reduction, better use of resources, conservation of biodiversity, and thus improve health conditions and the quality of life.

IINSTITUT EKO PRIVREDE SRBIJE IEPS as an innovative energy centre is a project of the company IEEG from Stara Pazova which develops communication and energy infrastructure that lays the foundation for sustainable development and the creation of new jobs and enterprises. The whole system of Energy Centre is interactive and makes unbreakable technology platform for integration into new market trends and products. The energy centre is located in the municipality of Stara Pazova near Belgrade in Serbia, one of the most attractive destinations for investments in Southeast Europe.

vvv

INTERKONT and IEEG team have participated in industrial innovative manufacturing processes especially in the car industry and RES since 1980. In addition to expertise, IEEG has experience and access to the corporate network that provides extensive knowledge in conception, development, production and implementation of new technologies and new scientific research.

IEEG energy centre (Institute of clean technologies and energy efficiency) in Stara Pazova, Serbia, is aimed at scientific research, development and implementation of clean technologies in the field of green economy and new industrial and technological integration of the electrical system and the production of electric cars, manufacturing micro power plants and energy storage. Through our programs of circular economy, innovative technologies and services we provide support to industrial modernization and investments of the private sector into the public sector, private and legal projects, local governments, cities, municipalities and regions. In this way, we provide the opportunity for support towards 100% renewable energy systems, sustainable measures and strategies with the aim of "Zero emissions".

Mr. Vujović Slavko, initiator and founder of IEEG company which has been operating continuously within INTERCONT company for more than 30 years, is an expert in innovative production and car industry, thanks to his long experience in this field. Likewise, Mr. Vujović is partner with BEOINVEST England and has direct cooperation with entities that are willing to finance investment projects in Serbia.

BEOINVEST ltd. is an international company with headquarters in England. It deals with financial affairs and is part of the International Financial Network called Union Funding. It is also a member of the environmental group La Familia eco – construction (Romus projects gmbh Austria), a long – standing member of the Serbian Chamber of Commerce, Board member of the Serbian economy and the President of the Institute of Serbian Economy IEPS.

GRUNDFOS: TO BE THE BEST WITH THE BEST

Grundfos factory in Indija holds LEED Gold certifiation which is the second highest certification in the field of environmental protection

Currently in the world, about 13% of primary energy consumption comes from renewable sources although the technological capacities are significantly higher. Contrary to renewable sources are non-renewable energy sources. They could be defined as sources whose reserves are expected to be exhausted for a maximum of a few hundred years, and whose regeneration could last several times longer. According to such trend, we in Grundfos believe that we have an obligation to behave responsibly always – in business and in society. We comply with international and local standards, regulations and legislation wherever we operate.

Furthermore, Grundfos operates in a manner that meets or exceeds compliance with the ethical, legal, and public expectations made by society. We are convinced that as a company, we have a responsibility towards the environment, employees, and local communities, as well as conducting a fair and correct behaviour towards our customers, suppliers and competitors.

In addition to corporate responsibility and compliance, sustainability is a key concept in Grundfos. The overall objective for this generation is to hand over our planet Earth to the next generation as cleaner and more energising place than we inherited. Sustainability is about meeting the needs of the present without compromising the ability of future generations to meet their own needs in terms of both natural resources and social wellbeing.

In Grundfos, sustainability is first and foremost related to the way we respond to the climate challenges. Grundfos strongly believes in enhancing our sustainability profile by offering cutting-edge green solutions, which will contribute to meeting a number of global challenges in terms of climate change, water constraints and demographic changes, while at the same time we make profitable and sound business in the long run.

As a global leader in pump solutions, we have a unique business opportunity in helping to improve energy efficiency. We believe that our ability to pioneer and deliver superior environmental solutions to solve problems such as water shortage, mismanagement of energy and natural resources, inefficient infrastructure and increasing CO2. It is clear that there will be a growing need for protection against flooding and better systems for transportation, filtration and water treatment. However, we have already launched products that can meet the demands and environmental standards of tomorrow and many of them are based in or originate from Grundfos.

Grundfos - being a part of the challenge - is ready to be a part of the solution. We do this by taking our own medicine and setting the goal never to emit more CO2 than we did in 2008.

This is an ambitious and important objective.
It is our ambition to be a frontrunner when it comes to energy-efficient and cost-efficient buildings. We take our own medicine by focusing on sustainability when constructing new buildings and renovating the existing ones.
Grundfos has set targets and defined a building code, which is a classification system showing the sustainability level of our buildings ranging from class 1-3, where class 1 buildings are those with low energy and water consumption or can achieve LEED Gold level awards.

TARGETS

• Define the 'Building code' for Grundfos Buildings and set specific improvements target for all Grundfos sites - year 2009.

• From 2010 building code class 1 will be considered as the target to strive for when constructing new Grundfos buildings.

• Renewable energy supply is chosen where the payback time is less than 5 years.

• By year 2015 the consumption of fossil based energy is reduced by 30% in all existing buildings (compared to year 2008). This can be achieved via reduction in energy consumption or via renewable energy supply.

• No Domestic Water has been used for irrigation from 2012.

• By year 2015 the reuse of grey wastewater and rainwater harvesting accounts for more than 30% of the water consumption in all existing Grundfos buildings (compared to year 2008).

We want Grundfos' buildings to support our values and brand. At the same time, we hope that they can inspire our customers and employees to sustainable solutions. As a global company, when planning new buildings as well as when renovating of existing constructions, we live up to the requirements in LEED (LEED Green Building Rating system), Gold level or corresponding requirements in accordance with a local standard.

Following these guidelines Grundfos factory in Indjija was built. It is a building with a LEED Gold certification, which is the second highest certificate in civil engineering in the field of environmental protection. The research regarding the installation of panels has been started on a huge deck surface, and there is an ongoing project water purification system that will be operated in the same way.
In order to increase the value we must bring responsibility and sustainability to a higher level, that is create common values. In simple terms, aiming to create value for Grundfos, we have to make value for the people in the countries in which we operate. Furthermore, we can deal with the solutions related to Grundfos pumps. Pumps currently consume 10% of global electricity. However, most are needlessly inefficient. With Grundfos high efficiency pumps and motor technology we can reduce the average pump's energy consumption by up to 60%. Our energy-efficient products are especially relevant due to increased legislation such as the EuP Directive. Some of those pumps are: MAGNA3, ALPHA2, ALPHA3 and all pumps with motors which have label Blueflux®.
The MAGNA3 is a circulator pump based on the tried and tested MAGNA technology and our
industry-leading experience with electronic pumps. The permanent magnet motor, AUTOadapt
function and integrated frequency converter is still a part of the MAGNA package, but to MAGNA3 pumps we have added some additional, ground-breaking new technologies. The result is a cutting-edge piece of intelligent technology that retains the unrivalled Grundfos reliability.

With 40 years of experience with electronically controlled pumps and 1 million test hours for the MAGNA3 in extreme conditions, including alternating pressure tests, high humidity tests as well as high and low temperature tests, we are confident that this pump will serve you day in and day out for many years to come.

MAGNA3 is a truly full-range pump with more than 150 different single and twin circulators in cast iron or stainless steel. We have also increased the maximum twin to 18 m and the flow to 70 m3/h. Get ready to specify a perfectly sized circulator pump for any HVAC application.
MAGNA3 gives you new opportunities with more intelligent control modes, optimized building management communication (BMS) and a built-in heat energy meter.
With an Energy Efficiency Index (EEI) well below the EuP benchmark level MAGNA3 can achieve energy savings of up to 75% compared to a typical installed circulator and thereby a remarkably fast return on investment.

MAGNA3 is the ideal pump for heating and cooling applications, recirculation of hot water as well as the transport of various antifreeze mixtures. It is designed to handle liquids at temperature from -10°C to 110°C, the ambient temperatures from 0°C to +40°C, which makes it suitable for both tough industrial tasks and ground source heat pump systems (GSHP).
Grundfos Blueflux® is Grundfos' motor & drives technology label. Grundfos Blueflux® technology represents the best from Grundfos within energy efficient motors and variable frequency converters - class IE4 (i.e MG motors, MGE motors and CUE drives). The Grundfos Blueflux® motor technology label ensures that the motor meets or exceeds international legislation regarding motor efficiency.
Every aspect of the technology driving a Grundfos Blueflux® motor has been developed to respond to the real needs of the application or the solution in which the pump system is installed – and always with an emphasis on reliability and efficiency.

A pump system or solution with a Grundfos Blueflux® motor has a considerably higher total efficiency than comparable solutions and reduces lifecycle costs substantially. When motor technology is combined with advanced pump design and the addition of speed control, Grundfos ensures superior system control, reduced day-to-day service costs, and lowered environmental impact.
Grundfos Blueflux® illustrates a range of skills and innovative processes that Grundfos brings to motor technology development. Grundfos was instrumental in the drafting and passing of the EuP Directive, setting the ecodesign requirements for electric motors for the European Union. As a technological leader of high-efficiency motors, Grundfos was invited to help with the technical aspects of the legislation.
Grundfos was able to create political awareness of the huge savings potential of variable speed motors and, at a late stage, to influence the decision makers to include variable frequency drives in the new legislation. As a consequence, Europe's annual electricity consumption will be reduced by 5% by 2020 – about 10 times more than originally planned before Grundfos intervened.

Our ability to get our knowledge of energy optimisation and of the issues facing customers taken into consideration by researchers, opinion leaders, politicians and partners means we are uniquely placed to offer solutions that keep Life Cycle Costs down, reduce CO2 emissions, and increase the sustainability of the pump system or solution.

The Grundfos Blueflux® label guarantees that the motor technology used is ahead of current market standards, and either meets or exceeds legislative requirements for motor efficiency, where these apply.

We believe that every day holds the possibility of solving the urgent challenges of the world. Every day we choose to take steps to care for our people, our planet and our business. In Grundfos everyone is invited to take part in making the world better. Only through a joint global effort will we be able to keep our core promise: to be responsible, to think ahead and to innovate the future. Step by step, day by day – every day.

CONSTRUCTION OF SOLAR POWER PLANTS
Runs the Domestic Industry

CEO of the company Energize Ltd, Mr. Vladimir Popović held a lecture on the application of solar energy in irritigation on Farmer's seminar on Tara during winter. The company (itself is relatively) young/ new but it can boast about numerous implemented projects. This is /precise/ reason why ENERGETSKI PORTAL wanted to talk with this young expert. On seminar which was organized on Tara mountain Mr. Popović said the following: "The application of solar energy in irrigation is very topical in the world. New better solutions appear and they reduce the price of systems. They are used for/in different variants of plant production in areas where the electric grid is not present/ does not exist and in which there is no adequate way of the system's power supply. The systems of solar pumps can be used in isolated districts and they reduce the need for diesel pumps and the fuel that runs them, as well as complete maintenance which such system brings with itself. The most applied system is 'drop by drop'. The advantage of the system is that it lasts 25 years, there is no maintenance of the system and no CO2 emission."

EP: Energize is a leader in the field of solar technology application and implementation of solar power plants with high percentage/share in the Serbian market. In your opinion, what is the current situation in the Serbian market? How attractive are renewable energy resources, especially/particularly solar energy, to investors?

Vladimir Popović: The application of renewable energy resources through the purchase of electricity at preferential price for the period of 12 years is a very good concept, if it is applied in the right way. In this way the government increases its capacities in the production of electricity through renewable resources in such a manner as to practically uses 12-year loan for the construction of the facility for which the investor is in charge of, with a very important fact and that is not to use their own resources and means of control and maintenance of the facility in the exploitation period which is not longer than 25 years. This concept functions only if both parties, state and investor, are alike satisfied or to simplify it if an adequate preferential price is applied (so-called 'feed-in' tariff). Our company has developed detailed studies and techno-economic analyses together with our partners and through National Association for Renewable Energy Resources in Serbia, which counts more than 100 member companies. We have developed that for the need of public debate about the new Regulation on renewable energy resources within/ under the Ministry of Mining and Energy in November 2015. All this was done in order to show the real framework of incentives and to have really stimulating investments into certain renewable resources. In this way we wanted to constructively help the Ministry of Mining and Energy, so that they would examine the real costs and challenges which investor has and they come from our experience and practice in construction. In the field of solar energy, according to the current market conditions, the incentives should vary from 0.19 EUR/kWh for solar power plants up to 30kE and to 0.145 EUR/kWh for the power plants larger than 500kW, in order to have investments which

would pay off in 10-year period. The investment would include all costs of annual fees/taxes, regular and periodical maintenance. If we compare annual allocations for the same installation of 200kW for small solar power plant and mini hydro power plant, taking into account that nominal maximal annual production of solar power plant is 1500kWh of installed power and for the mini hydro power plant is 5000kWh of the installed power, we come to the conclusion that the incentives for the production of solar energy should be 3.33 times higher compared to the incentives for the production of hydro energy in order to have the same annual allocations for the preferential price. However, the new Regulation defines the feed-in tariffs which are at the same level for solar and hydro energy, thus putting solar energy in an unequal position. Additionally, under the new regulation, quotas for the installations are 500MW for wind farms and 10 MW for solar power plants. We need a necessary balance in renewable energy sources, especially in decentralized production at the site of consumption and this is the reason why we think that the government has to stand behind the projects of construction of solar power plants on the roofs of the facilities. The information which many people do not know is the fact that more than 55% of cost origin in the construction comes from domestic market, so investing in this renewable energy source directly and indirectly runs domestic industry. Personally, I think that it is necessary to increase quota for solar power plants in proportion to other renewable resources to approximately 75-100 MW, due to the fact that this form or renewable energy sources can be used directly at the consumption site; it can decentralize the production and balance the load of distributive network. Solar power plants cost the state less than other RES, and they also do not introduce any harmful effects on the environment with the reduction of CO2 emission benefits. In this way we would be on par with the neighboring countries such as Croatia, Rumania, Bulgaria and Macedonia, taking into account the ratio of the population in these countries.

EP: What is your previous experience with partners, banks and municipalities? What are your plans for upcoming period? Do you have any projects outside our borders?

Vladimir Popović: The company Energize has expanded its business onto regional market including Montenegro, Bosnia and Herzegovina, Macedonia and Albania and we have plans for further expansion. It means that our company has an open opportunity to increase export on the regional market. We would not be able to do this without the help of partners and banks, and above all the effective help of state institutions, which every company needs for the proper development of export. My personal wish is to move the manufacture of one of our partners, who are by far the leading companies in this field in the world, into Serbia. This requires quality platform for investing and the support at the local market.

EP: What would you point out as the biggest advantage of Energize company on our market comparing to other companies similar to yours? Did you work by the model of some foreign company or you have created know-how specific for our conditions through the work?

Vladimir Popović: We are on the same page with our clients and we do not make any compromise with the quality and those are our main advantages.

EP: In your opinion, are renewable energy resources the future of local self-governments, heating plants, power plants, public institutions, etc.?

Vladimir Popović: Absolutely, yes, even more than that. Taking into account the fact that the conversion coefficient of solar energy into electricity is roughly 16%, achieved in the laboratory conditions in the 60's of the previous century, and that 50 years later it is still in the commercial usage/application around the world, it is clear that the first major breakthrough in the research in the increase of conversion efficiency will mean that the solar energy will be an integral part of our everyday life.

Interview by: Vesna Vukajlović

NEW ENERGY
with Energize Ltd.

Energize Ltd. is a company founded in 2012 in Belgrade with a unique business model. It is a representative office of leading world companies in the field of solar energy, power supply, energy storage, energy, IT industry and telecommunications industry. Creative and well-trained Energize team of electrical engineers is dedicated to providing the most technologically advanced solutions of highest quality in the areas of solar power plants, data centers, power plant stations, power in energy production, transport and distribution of electricity, hybrid systems, battery systems, the protection of manufacturing processes, surge protection and other specialized areas. Energize Ltd. has representative offices in Serbia, Bosnia and Herzegovina, Montenegro, Macedonia, Albania and Croatia and that is how it covers the whole territory with a full technical and service support for all customers. Furthermore, with additional education and trainings for partners we enable market development and the positioning of brands. Our expertise in the area of energy and power systems, as well as the experience in the design and realization of complex systems has been recognized by our network of partners operating in the territory of Southeast Europe.

OUR MISSION

Through the implementation of the latest technologies, innovative products, and unique business approach we wish to fully develop the market of renewable energy sources and energy storage systems in the whole Balkans.

SPECIALIZATION

Solar power plants, solar technology and applied solutions, industrial batteries and energy storage systems, power solutions, innovations (research and development), representation of foreign companies and market development.

Energize

We energize the future

PREVIOUS SUCCESS IN THE FIELD OF SOLAR ENERGY

The company Energize Ltd. participated in the implementation of over 100 solar power plants, solar power stations, solar isolated systems and other facilities with the application of solar energy in the country and in the region. Total reference of our company is currently 8MWp and our market share is almost 85% and thereby we became convincing market leaders. We are the only ones in Serbia who have a lager of PV modules in Belgrade of the capacity of 2.5MWp for projects in the region. We work exclusively with world leading manufacturers and we make no compromises in terms of quality. Our company is the only authorized center for sales, installation and service by all the producers we work with. Check why 85% of installations in Serbia were done with our equipment.

Interested users can obtain the equipment or get a whole system as the turnkey principle that is implemented with the help of our partners. Our experience in the field of solar energy is more that 12 years in theory (our representatives held courses and trainings at institutes) and more than 4 years in practice (first installations in 2012). In order to estimate the level of quality of solar pumping stations, you can visit one of our locations and you will see in what way the standards are applied in the construction of solar stations. We guarantee best quality and price ratio for the systems whose service life is over 25 years. As far as the equipment safety is concerned, and that is a frequent question of our users, our company applies several options to protect and secure the equipment and absolutely none of more than 40.000 delivered solar PV modules was stolen. Check with our team how and why.

Welcome to: www.energize.rs

e-mail: office@energize.rs

ESCO CONCEPT
in the Energy Sector

ESCO - Energy Saving Company Belgrade is an engineering and consulting company that deals with new technologies in areas of renewable energy and efficient energy use, as well as electric power technologies and technology assessment methodologies.

Established in 1999 as private company named Global Business Centar, Belgrade. The company name was changed in 2006, for developing company's strategy to further specialization and appliance of specific concept of engineering services in energetic area, as well to promote the name of this concept, to ESCO Belgrade.

PRIMARY COMPANY'S EFFORT:

Engineering and consulting in preparing, development and implementation of energy efficiency projects, intended to achieve rational use and energy saving, as well as the increase in energy efficiency, in industry plants, business and public buildings.

- *Technical implementation and maintenance of equipment of high technology level*
- *Finance engineering*
- *Transmitting experience and knowledge of world leaders in this area to domestic market*

As an engineering and consulting company ESCO - Belgrade provides project management concept for ruling its own current or developing tasks. At this organization schema, number of performers and other necessary resources depend on project needs and it moulds and organizes in a team form.

ESCO concept managing demands high vocational skill and high interdisciplinary experience. Working structure contains from 8 permanent employed personnel, 6 with a university degree. Apart from technical experience, they have managing and organizing skills and extremely high knowledge of banking procedures, legal acts and all parts of finance engineering.

As we are dealing with the appliance and implementation of new technology, apart from full time personnel it is necessary to utilize local and foreign professional consultants.

ESCO BEOGRAD

HOW TO INCREASE DOMESTIC
Production and Consumption

There is a long list of completed projects of ESCO company headed by Mr. Dejan Lazarević. AD Imlek, Meat Industry Neoplanta, Knjaz Miloš AD Aranđelovac and many other local companies cooperated with ESCO company. During the conversation with Mr. Lazarević, we found out what are the difficulties and the highest potentials in Serbia when it comes to renewable energy sources and why we can become energy-dependent if we follow all pieces of advice of world experts. Our interlocutor emphasized repeatedly that so-called 'industrial patriotism' is the most important and the revival of domestic economy which should be the biggest consumer. Energy efficiency should be increased but because of our own interest.

- I think that the topics of pollution reduction and similar, are the trend of globalist energy subjugation. They say: close TE Kostolac, do this or that, but we have not revitalized the existing and we have not upgraded what we possess. That is how you become energy-dependent. The story of ecology is true, we should preserve the nature and the environment, but you cannot close plants under these slogans. We have sold our economy, companies engaged in food processing, companies that process water and now there is energy sector left.

As for the renewable energy, it is a very broad term. There are biogas, biomass, geothermal energy, says Mr. Lazarević, and technically nothing is impossible, but it is very difficult to bring the project to the point of profitability. What is the return on investment, will you ever return the investment, and there is yet another question who can apply that? Big industry that no longer exists or local government? - wonders Mr. Lazarević and adds that it is important what are you replacing with what!

- You have cheap electricity, cheap coal and now it needs to be changed. We are all pushed in renewable energy, but the system has not been completed yet. The industry barely makes ends meet, and then it is required to invest in one, then in other measure. ESCO is that company that should by default provide the service, share some profits, and invest in measures. We also prepare the pre-investment documentation, feasibility studies based on which the company decides whether to enter into a business, and the motive in business is always profit – explains Mr. Lazarević and says that the studies are submitted to other auditing firms to be checked.

- Simply, one plant is not isolated, not just for itself, but in the chain and in that chain they all affect each other. Since everything stagnates in the industry, you cannot set as the priority objective the increase of the use of energy from renewable energy sources, which can be in the third place. First you must increase consumption and production.

According to the opinion of Mr. Lazarević, biomass is completely unexploited. Then the potential of crop residues, waste… This resource should be used in projects that are planned through models of public-private partnership.

- Those things that are pushed are always in someone's interest. Banks have their own products, their credit lines and they are interested to be sure where the lowest risks are. In the energy system it is important to have balance, because if you produce more energy it will be difficult to charge that. And if you take electricity from someone else's system, you will pay that dearly.

Interview by: Vesna Vukajlović

THE SUN IRRIGATES
a Carrot

Droughty, hot, summer day will no longer worry Marko Čarnić, vegetable grower from Begeč, near Novi Sad. From now on the sun also works for Čarnić, who is one of the biggest manufacturers of carrots not only in Serbia but also in the region. Part of his tilths seeded with carrots, is watered by an irrigation system which is run by solar energy. This system is the first of its kind in Serbia. While pointing to the system of 27 solar panels which are placed next to the main road, Marko Čarnić explains that he cultivates around 200 acres on which carrot occupies the biggest part almost 120 acres. 7,000 tons of carrot is produced for sale annually. Vegetable crops are stored in a modern cold storage, recently built, whose capacity is 6,000 tons.

– Truth to be told, I never feared the drought, because all my fields are covered by irrigation systems driven by diesel generators – said Čarnić.

– However, I contemplate this system as an investment into the future. It will show the effects for more than 20 years, since it achieves significant savings especially in fuel. Thus, we become more competitive, and that is very important now when we will face the reduction of customs protection and the arrival of EU products on our market.

Marko Čarnić explains how the investment of 28,000 EUR pays off for a maximum of three years. He had a maximum support of ProCredit bank in financing and also in finding a company that is engaged in designing and installation of solar irrigation system run by solar energy. For the time being, this system waters 6 acres of land, but very soon it will be extended to the neighbouring field, so that it will cover the total of 14 acres.

Janko Medveđ, his colleague, is also a major producer of carrots also from Begeč. He grows this vegetable on about 130 acres, and he is also thinking about setting up this kind of a system, but he has certain dilemmas.

– The biggest problem would be its mobility – said Medveđ. – In order to have good results, I need to respect the crop rotation, that is, I cannot grow only vegetable crops that do not require irrigation. Therefore, it would be priceless if I could move it, but anyway I will see what will Marko's experience be like and then I will decide.

Irrigation system, which Čarnić has installed and whose power is 7,5kW can pump out 500 cubic meter of water a day. Each system is specially designed depending on the needs of the farmer and it can be controlled remotely via the Internet connection. The panels are resistant to impacts, and the entire system requires minimal investment in maintenance in the next 25 years.

CONDITIONS

The solar irrigation systems, specifies Milorad Klačar from ProCredit Bank, can be purchased through a loan which is approved by the bank, with the repayment period from 24 to 84 months.

– The terms of funding offered by ProCredit Bank are very favourable. With maturity of up to 2 years where the interest rate is paid by the seller for this type of investment, while the nominal interest rate is 3.5% +6M Euribor for the maturity of over 2 years. In addition to the outstanding favourableness of financing, ProCredit Bank offers the possibility of returning the system to the manufacturer after 6 months of use, if the system does not meet the required performance. I would point out that this offer is designed to make this new type of technology more attractive to its end users.

EXAMPLE OF GOOD PRACTICE IN THE USE OF RENEWABLE ENERGY SOURCES

Small Solar Power Plants 'Solaris 1' and 'Solaris 2'

Solaris Energy is the company established as a holder of the investment for one of the first solar power plants in Serbia. Knowledge, expertise, energy and vision that were implemented in the development of this project, resulted in two small power plants 'Solaris 1' and 'Solaris 2' and each has installed power of 999 KW. They were constructed in the territory of Kladovo municipality. The investors have thoroughly followed specificity of micro climate by using official statistic and historical facts in addition to using up-to-date satellite images and sun radiation maps. They have also analysed and thoroughly monitored the possibility of further placement of the total produced electricity, the assessment of soil composition and many other relevant indicators which the investor has analysed in details.

Such analyses led to the conclusion that the best place for the construction of solar power plant is in Kladovo municipality, to be precise in the village Velesnica. Due to all these mentioned factors, analyses and the projections, Solaris Energy Ltd was convinced that they will carry out the set task.

Small solar power plants 'Solaris 1' and 'Solaris 2' are placed on 2.4 acres and they are in the ownership of Solaris Energy Ltd. The entire area of set solar panels in the both plants is 13,600 m2.

After the development of the entire project and technical documentation and obtaining the necessary legal and administrative documentation SPP 'Solaris 1' was put in operation at the end of 2013, while 'Solaris 2' was put in operation a year later. Domestic and local residence,

as well as significant number of domestic companies were engaged in the construction of both solar power plants.

'Solaris Energy Ltd' has the status of a privileged producer of electricity with a guaranteed preferential selling price for the following 12 years.

In the previous period, during the continuous work of solar power plants, daily control over the power plants was performed as well as the control of all of its systems and subsystems.

Based on the monitoring, timely reaction of professional staff responsible for the smooth operation of power plant and further analyses of all parameters related to the production of electricity, Solaris Energy Ltd can boast with the fact that the achieved electricity production and efficiency of solar power plant is higher for 13.6% for SPP 'Solaris 1' and 10.6% for SPP 'Solaris 2' in relation to the projected expected values under the same or similar conditions of operating solar power plants.

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