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WATER MANAGEMENT

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WASTE MATERIALS OF ONE INDUSTRY Will Become Raw Materials of Another

The Chief of the Department for Waste Management at the Ministry of Agriculture and Environmental Protection is Ms Radmila Šerović who has been working in the state administration since 2002. More precisely, she has been engaged in waste management in relevant ministries since 2007. She has received certificates as coach educator in the field of project management and the jobs of European Union Certificate from the Ministry of Foreign Affairs of the Kingdom of Denmark, Centre for European Studies in Strasbourg, the College of Europe Bruges and the Faculty of Political Sciences in Belgrade. She has obtained the most significant certificate from Japan International Cooperation Agency – JICA. It is a certificate for additional professional training in the field of 'Management of Municipal Waste and Other Types of Waste' in the period from 12th January to 22nd February 2009. We have talked to Ms. Šerović about all the Amendments and Supplements to the Laws concerning waste management in Serbia.

EP: Can you tell us in a nutshell something about the Law on Waste Management and its development from 2009 to the present, to be more precise, to the Supplements that were adopted in March this year? What would be the weakest point of the Law in Serbia? Are the Laws obeyed enough?

Radmila Šerović: One of the reasons for proposing Amendments and Supplements to this Law is to ensure the compliance of legislative and legal solutions in the field of waste management. These Amendments and Supplements were related to the system for financing of waste management after the Law on Fund had come into force on 29th September 2012 and so far financing was implemented through the Fund. Namely, after the Law had entered into force, the Fund for Environmental Protection stopped working. In order to establish the continuous functioning of the system for financing of environmental protection and the need for the appropriate use of funds for environmental protection, changes have been proposed in the Law even in this part that are in accordance with the provisions of the Law on the Budget System.

The focus of environmental protection of developed countries, including the EU countries, represents a high level of environmental protection and its foundation on economic principles ('polluter pays'). Solving the problem of environmental pollution due to inadequate waste management and the appropriate use of benefits takes into account the application of the principle 'polluter pays' in accordance with the Council Recommendation 75/436 Euratom, ECSC, EEC on the determination of costs and actions



Radmila Šerović

of public authorities in the field of environmental protection – the principle 'polluter pays'.

Amendments and Supplements to the Law on Waste Management achieve the general objectives established by the Law, in reference to the application of principle 'polluter pays' established by the Law on Environmental Protection on equal terms for all legal entities engaged in economic activity on the territory of the Republic of Serbia. It lays down the financing of waste management in accordance with the solutions provided in the proposed Amendments and Supplements to the Law of the Environmental Protection, and thus establishing the Green Fund of the Republic of Serbia.

The proposed legislative solutions have no negative effect on economic operators, because they are related to the filling of legal gaps, specifying of provisions, ensuring continuity in the operation of the new power plants which are subjected to integrated permit, and they are in connection with the Environmental Protection Fund's ceasing to work. These proposed legislative solutions also represent the harmonisation with the solutions proposed in the Law on Environmental Protection and at the same time they enable the continuity in the functioning of the system for financing environmental protection, including the management of specific waste streams. During the implementation of the Law, legislative, administrative, supervisory, institutional, technical organisational, economic measures as well as the measures for raising public awareness will be taken.

LEGISLATIVE, ADMINISTRATIVE AND SUPERVISORY ADMINISTRATIVE MEASURES:

- Revision and adaptation of the Waste Management Strategy with the National Plan and program for the prevention of waste generation
- Harmonisation of regional and local plans for waste management with the National Plan
- Adaptation of executive regulations based on this Law
- Establishing the framework for the application of technical



requirements for by-products and for certain types of waste which, in accordance with the regulations of European Union, cease to be waste

- Revision of the system for authorising organisations for waste testing
- The introduction and application of the system of super analysis in case of doubt in the report of the waste testing
- Improving the system for issuing, modification and revocation of licenses for waste management, and especially for waste management plants that are subjected to integrated permit
- Establishing the registration of intermediaries, that is waste retailers,
- Revision of the regulations on medical and pharmaceutical waste

TECHNICAL AND TECHNOLOGICAL MEASURES:

- Solving the problem of hazardous waste storage
- Development of the system for the waste treatment, including hazardous waste
- Ensuring the disposal of household waste in containers or some other way;
- Ensuring and equipping of the centre for collecting of household waste that cannot be disposed in the municipal waste containers (bulky or other waste) including hazardous household waste
- Greater use of ash from thermal power plants as secondary raw materials (cement factories, construction systems)
- Replacement of the devices with PCB oil, decontamination of the equipment, destruction of all hazardous waste materials with PCB

INSTITUTIONAL AND ORGANISATIONAL MEASURES:

- Establishment of the cooperation between the authorities for issuing licenses and operators that are subjected to integrated permit
- Strengthening of the control mechanisms for monitoring of the hazardous waste movement and the improvement of the reporting system in the filed of waste management

DEVELOPMENT OF PUBLIC AWARENESS:

- Development and implementation of the program for constant communication with all the participants of waste management that are subjected to the integrated permit
- In the domain of amendments related to funding, it is not necessary to undertake measures for the implementation of suggested solutions.

EP: Development of the National Plan for the management of construction waste is planned with the financial support of the EU. Tell us more about the plan.

Radmila Šerović: The EU finances IPA 2013 project 'Improvement of hazardous waste management in the Republic of Serbia' which is ongoing. Within this project, we have been

working on the development of the Plan for construction and demolition waste management in cooperation with the Austrian Agency for Environmental Protection as well as with German Federal Ministry. The first workshop was held in December last year and the next was held on 17th June 2016 on which the experts presented the Draft of the Plan. The plan is mostly related to the sorting of waste at the construction site, as well as the way of disposal of hazardous construction waste.

Construction waste is by its volume and weight one of the most extensive waste flows in the European Union, and also the field in the Republic of Serbia which needs to be regulated. Article 38 of the Law on Waste Management stipulates the reuse and reutilization, (which states that the construction and demolition waste can be reused and reutilized). With the amendments to the Law which are planned in the future we will have a legal framework for the adoption of the Rulebook on the treatment of construction and demolition waste.

EP: Recently, you have pointed out at the meeting at Chamber of Commerce and Industry of Serbia that only 5 to 15 percent of the total waste is recycled in Serbia. What would be the EU standards to which we strive for? How can we increase the volume of recycling in industry and public sector?

Radmila Šerović: In 2010 the Government of the Republic of Serbia adopted the Strategy for Waste Management for the period from 2010 to 2019, which included the management of the specific waste flows. It lays down the guidelines and measures to reduce the pressure on the environment caused by generation and waste management. The system is organised integrally, with all the participants in the system at the national, provincial and local level. The strategy emphasizes the importance of prevention, that is reduction of waste, reuse and the recycling of all types of waste. It is aimed at reducing the impact of waste as well as the products that will become waste, whereby this impact should be reduced during all stages of products lifecycle in order to be more efficiently and fully implemented. Waste materials should not be regarded solely as a source of waste and pollution, but also as a substitute for increasingly scarce natural resources (metallic, non-metallic, vegetable and animal raw materials as well as energy generating products) and they must be better utilized. The Law on Waste Management and the Law on Packaging and Packaging Waste were adopted in 2009 together with a package of bylaws which arise from these two laws and which have become the basis for establishing and improving of waste management in the Republic of Serbia and also for the establishment of the recycling industry.

In Serbia, waste materials that are reused or treated for reuse and that belong to the category of non-hazardous waste are: paper, cardboard, plastic, ferrous metals, non-ferrous metals, waste tires, but also organic materials, wood and textiles. As far as hazardous waste is concerned, in Serbia we recycle waste oils, waste from electrical and electronic equipment,



fluorescent tubes containing mercury, waste batteries and to a lesser extent, waste vehicles. Waste batteries (particularly those used in households) are almost not recycled at all. Waste from chemical industry (organic and inorganic waste) is treated only in few plants with neutralization and solidification process. Packaging contaminated with hazardous waste is treated either with liquid nitrogen and dry ice process or washing process. Most of these materials is the part of regional (compost, wood), national (glass) or international (paper, plastic, ferrous metals, non-ferrous metals and textiles) market. In the past, the stocks, which were the most accessible and the easiest for reuse and selling (metal scraps, non-ferrous metals, paper) were first targeted. Recycling capacities in the Republic of Serbia are increasing under current conditions. It is estimated that 10-15 percent of waste is recycled in Serbia. There has been a sudden increase of companies engaged in recycling waste in Serbia since 2003 until today. Waste Management Strategy within long-term goals that RS must fulfill, outlines the objective that it is necessary to raise the rate of recovery and recycling of packaging waste (glass, paper, cardboard, metal and plastics) to 25% of its volumes in the period from 2015 to 2019.

The total number of licenses issued to the operators for the collection, transportation, storage and waste treatment by all the institutions (Ministry, provincial authorities, and local self-government) exceeds 2000. On the official web site of the Agency for the Environmental Protection, www.sepa.gov.rs, one can see the Register of issued permits on the territory of the Republic of Serbia. The number of issued permits confirms the fact that the system of waste recycling (recycling industry) in Serbia is rapidly being established, in addition significant collecting network is being created which represents very important, necessary element for establishment and improvement of that system. The issued licences represent only the first step in the creation of a comprehensive system of environmental protection, since the process is not closed; it is the process that requires serious reconsideration and newly improved content. Over the last few years, the state has seriously stipulated green and recycling industry by issuing permits and subsidies and enabled equal opportunities for all those who are interested. Investments in technology, professional staff and integrated system for control and monitoring of waste flow are necessary for quality waste recycling management. In accordance with the examples of good practice in developed countries, it is necessary to reconsider the procedures for issuing permits, because non-transparent and uncontrolled circulation of recycled waste, that is secondary raw materials, is the incentive for the crime which is unfortunately present especially in specific flow of waste oils and vehicles. Therefore, much better control of tax administration and environmental protection inspection is necessary. Through amendments and supplements to the Law on Waste Management, which are now in the procedure, the new framework in this area is sought and everything is in accordance with the EU legislation which needs to be entirely transferred into the legislation of RS.

It should clearly define and prescribe the necessary incentive economic instruments as a basis for the improvement of existing system for recycling waste management that is specific waste flows. Scientific and professional public in the environmental protection absolutely agree on the necessity for establishment and functioning of the new model for financing of 'green' fund (after the adaptation of the Law on Amendments and Supplement of Waste Management which came into force on 1st March, 2016) as a budgetary fund. This will provide indispensable financial independence of environmental protection and thus more reliable development of recycling industry.

EP: Circular economy is the future of world and European economy. What branches of economy and industry in Serbia need to undergo the biggest change and adaptation? Is it possible to be adequately prepared for the EU, so we would not experience the faith of Greece or Croatia which pay for numerous penalties?

Radmila Šerović: The European Commission adopted a new legal framework for the introduction of the circular economy model in 2015 in order to strengthen the economy and ensure sustainable economy growth through sustainable use of resources. The proposed measures, such as the increase of reuse and waste recycling instead of its disposal at the landfill, 'close the circle', precisely that brings out the most possible benefit from all raw materials, products and waste with the increase of energy savings and reduction of air, water and soil pollution. Circular economy represents different economic model which tends to longevity of the products and returning of all waste materials in the production processes, implying the efficient use of resources and reduced pollution of the environment with achieving financial savings and creating new business possibilities. Solutions which this concept offers are based on the processes that take place every day in the nature, whereby the waste of one industry represents the raw material for the other industry. Taking into account the recommendations of the European Commission on circular economy, the Ministry of Agriculture and Environmental Protection has suggested the amendments and supplements for the three laws in the field of environmental protection including the Amendments and Supplements to the Law on Waste Management which the National Assembly adopted this year. Amendments and Supplements to the Law on Environmental Protection envisages the establishment of Green fund of the Republic of Serbia, as well as Budgetary fund which will, among other things, enable sustainable financing of the system for waste management.

NEW LEGAL SOLUTIONS ENABLE:

- Support for the concept of sustainable development and circular economy
 - Opening of 'green' workplaces
- Two new legal institutions are introduced:
- 'The end of waste status' – certain types of waste stop being



one after the treatment and fulfilment of stipulated standards

- 'By-product' – the use of produced residue from the production process, after being written down in the register of by-products

NEW LEGAL SOLUTIONS STRENGTHEN THE PRINCIPLE OF WASTE MANAGEMENT HIERARCHY:

1. Prevention of waste production – it foresees the adaptation of program for the prevention of waste production and establishment of preventive measures that effect the general terms of waste production, design, production, distribution, consumption and the phase of product's usage
2. Preparation for the reuse – is the precondition for further arrangement and development of the system for the reparation of the products
3. Recycling – the obligation of taking measures which enable the high quality of the recycling is envisaged – the establishment of separate waste collection
4. Other operations of waste reuse
5. Waste disposal

LEGAL SOLUTIONS RELATED TO LOCAL SELF-GOVERNMENTS:

- Selection and separate collection of waste in order to recycle
- Centres for household waste collection
- Record of illegal dumps
- Record and designs of sanitation and re-cultivation of existing non-sanitary dumps/landfills
- The Agreement with one or more local self-governments on the location for the construction and operation of the plant for treatment, storage, reuse and disposal of waste on their territory

The policy of the Ministry is being developed with the aim of giving support and promoting the system of waste recycling, in order to strengthen the socio-economic business in the field of waste management as one of the basic conditions for successful operation of the industry, economy and society as a whole, which is the basic pillar of sustainable development to which all developed countries of the EU aspire. Implementation and development of the waste management in Serbia must be based on the legal framework, and this is one of the necessary conditions for achieving the

concrete results with mandatory provisions of financial instruments necessary for the implementation of the programs and projects in the field of waste management.

Preconditions for the implementation of necessary investments in the social and public sector in the field of waste management and especially in the field of the construction of the plant for municipal waste treatment, plant for treatment and management of hazardous waste treatment and others are:

1. Ensuring stable and sustainable system of financing of environmental protection, on the republic, provincial and also on local level in terms of financial preparation of project design documentation for large infrastructural projects as well as co-financing of the implementation of the same projects, which means providing secure financial resources for co-financing of infrastructural projects which are financed from the EU funds;
2. The preparation of infrastructural projects in the field of environmental protection and waste management on the republic, provincial and local level in terms of the preparation of project design documentation for the construction, with which one can apply at the EU funds (IPA and others) or at the other international funds for funding or cofounding of the project's implementation.

When we speak about special waste flows, especially on packaging and packaging of waste, the national goals which are related to reuse and recycling of packaging waste for the period from 2015 to 2019 are defined in this new Regulation on establishing of the Plan for the reduction of packaging waste, which was adopted at the end of 2014 by the Government of the Republic of Serbia and which is harmonised with the EU Directives. In order to achieve national targets for the following period, it is necessary to continue working on raising of public awareness and capacities of legal persons, even with more intensive involvement of the system for management of packaging and packaging waste, as well as intensifying inspection of the companies.

Harmonisation of legal regulations with the EU regulatives is the process which is constantly ongoing. In the next period, we will face harmonization with the Law on Waste Management with the new WU directive on waste (Directive 2008/98 EZ) and the other regulations which are derived from the stated directive, the revision of the Law on packaging and packaging waste and by-laws which are derived from the stated Laws. The construction of regional centres for the management of solid municipal waste is a strategic goal of



the Republic of Serbia, which includes the construction of the entire infrastructure for the efficient and effective waste management. The infrastructure includes the construction of transfer stations for the collection and separation of the recyclable components from waste, but also the construction of recycling yards and the plants for the waste utilization with the aim of obtaining energy. Only the waste types that cannot be reused and recycled or cannot be used for obtaining energy, can be disposed in the landfills, in accordance with the Regulation on Waste Disposal in the Landfill which the Government of the Republic of Serbia adopted in 2010.

All local self-governments have the obligation to develop regional and local plans for waste management in the short term. Further construction of regional sanitary landfills and transfer stations, plants for the separation of the recyclable waste, expansion of the scope for waste management, composition plants and more is expected. It is necessary to work intensively on the preparation of planning and technical documentation for the construction of regional centres for waste management. There is an obligation for signing inter municipal agreements on joint waste management. It is necessary to establish regional companies for waste management. In case of disagreement between local self government in terms of determining the location for the waste management plant, the Government will make the decision on the location on the proposal of the Ministry, that is competent authority of autonomous province. In the long run, it is necessary to focus on achievement of the objectives in recycling packaging waste (2025), recycling of the material from municipal waste (2030) and in completion of the construction of the regional centres for municipal waste management in all the regions, in order to dispose the waste in the landfills in accordance with the requirements of the EU Directive on Landfill (2028). It is necessary to be focused on reaching the targets for the reduction of biodegradable waste disposal on the landfills (2022, 2026 and 2030) with the construction of the plant for composting, anaerobic digestion or MBT/ utilisation of energy from waste. Sanitation of the existing landfills, that represent the greatest risk for the environment, will be carried out. The construction of the plant for the utilisation of the energy from municipal waste, as well as the construction of the central plant for incineration of hazardous and medical waste is also planned.

THE DEVELOPMENT OF THE NECESSARY INFRASTRUCTURE IS PLANNED IN TWO PHASES. THE FIRST CONSTRUCTION PHASE OF THE INFRASTRUCTURE INCLUDES THE FOLLOWING:

- Expanding the coverage of waste collection to 100 percent of the population;
- Primary selection, separate collection of recyclable waste – paper, plastic, glass and metal;
- Plant for secondary separation of recyclable waste – a “clean” line to separate pre-sorted waste;
- Centres for separate collection of recyclable waste (recycling centres, bulky waste, waste from electrical and electronic equipment, hazardous waste from households);
- Sanitary landfill;

- Composting of separately collected bio-waste (green waste from parks and public spaces to the least extent);
- Closure of the existing landfill dumps.



Infrastructure construction in the second phase in this case means the introduction of more modern and expensive technologies for the treatment of municipal waste, such as anaerobic digestion, energy recovery from waste. The second phase of infrastructure construction (facilities for energy recovery from waste, mechanical-biological treatment of waste) will be implemented later, except in cases of cities with the largest number of inhabitants in Serbia (Beograd, Nis and Novi Sad), where the construction of the first and second phase will take place simultaneously.

- Utilization of waste to generate electricity and district heating and 100 percent utilization of biodegradable waste;
- The mechanical-biological treatment of waste for composting, fuel production from waste for combustion or other methods.

The national system of environmental financing requires political support in order to establish appropriate facilities for the financing and implementation of projects and programs. It is necessary to provide institutional and human resources and financial capacities for simultaneous planning and implementation of national and donor (primarily IPA) funds. Taking into consideration estimated resources that will be on disposal after joining the EU, it is essential to start intensive preparation of investment projects by using resources (national and international) as soon as possible. When we talk about the establishment and improvement of the financing system in the field of environmental protection as well as waste management, the priority of the Ministry of Agriculture and Environmental Protection is certainly providing conditions for regular filling the budget. It is not a problem to provide programs and projects, but if we fail to provide enough money in the budget to realize those programs and projects, we cannot ensure the sustainability of the waste management system. The Ministry of Agriculture and Environmental Protection believes that filling the budget lies in a more efficient process of collecting eco-taxes and better functioning of the Green Fund in the function of sustainability of environmental protection and waste management. Fees must be charged regularly and in full amount, and the proposed model is that all importers of products that become special waste flows after use, pay a fee for the customs and that all manufacturers of those products pay the same fee when placing these products on the market of the Republic of Serbia.

Interview by: Vesna Vukajlović



THERE IS CONSTANTLY FEWER WATER RESOURCES

Better Management Is Necessary

While preparing for the interview with PhD Nebojša Veljković, we have performed several experiments and easily made sure that the litre of water is more expensive than the litre of petrol. Continuation of the conversation is well-known, and that is a fact that water makes 70 percent of the planet and of our body. Serbia is rich in water resources but it is still limited and we do not have it in abundance. In the last 3 decades, much geopolitical yeast in the world happen due to drought and energy sources. Rivers and their flows are actually extremely important for life and work of people, so much that 40 percent of people on the planet live in the basins of rivers and lakes which include two or more countries. Even 90 percent of people live in the countries which have river basins. Therefore, water management represents a complex web of activities and measurements which are not only technical but also envisage the harmonisation of supply and demand, management of services and purpose and what is more important the management of the resource itself. PhD Nebojša Veljković is the Head of the Department for monitoring of water quality and sediment in the Serbian Environmental Protection Agency and he shared with us some scientific findings and knowledge in the field of water management in Serbia.

EP: Available water resources for human needs are not abundant. What is the real situation and can we expect water scarcity in Serbia also?

Nebojša Veljković: The public in our country and unfortunately experts keep forgetting that we already live in a catastrophic century with all the characteristics that you have mentioned. It seems that we do not notice that the litre of bottled water in restaurants is more expensive than the litre of petrol. The war in Syria is most probably the first conflict in the 21st century which can be brought in the connection with the climate change and drought, that is water scarcity. More than a million people, refugees and immigrants have entered Western Europe with future serious socio-economic and political consequences for the continent. In most of the analyses and reports, especially in our country, the ecological factors of Syrian crisis haven't been highlighted. The region has suffered a long period of droughts in the years that preceded the rebellion and the civil war. After 2009 in southern Syria, farmers haven't been able to cultivate and preserve crops and cattle fund due to droughts, so they migrated from rural to urban areas. Protests began in Dara in 2011 and spread out under the influence of Islamic extremism which was joined by a foreign political factor and that is how the catastrophe was created. It is important to understand that the drought here is in the background of the problem and that unpreparedness on the impact of climate change is the key



Nebojša Veljković

explanation. The Syrian government was neglecting the investment in water management during the decades-long period, and the shortfall of yield in the agricultural production during the period of drought has caused the lack of basic livelihoods and thus enhanced the existing social tensions and political instability. The lesson from the Syrian conflict is clear – water scarcity crisis is always connected to the other associated factors. Serbia is located on the European continent and generally on the world map it is outside the zone of water scarcity. However, as far as we are concerned, certain parts of Serbia have the same symptoms of the disease called 'water stress', like certain parts of Italy, France and southern Spain which are already in chronic shortage of water. We witnessed the disruption of water supply in Užice in 2014 and a three-month ban of water use in Požarevac from October 2015 to January 2016. In both cases it happened because of the sensitivity to climate changes. In the first case it was due to the development of toxic cyanobacteria in the accumulation for water supply happen due to favourable warmer conditions for their growth. What happened in the second case was the deficit of supplemental feeding of the groundwater source which deteriorated in quality and it was a direct consequence of reduced flow in the Velika Morava. These are individual cases which will certainly be increased if all the projections of climate change are accomplished, and it is something that even hydro meteorological data and climate mathematical models for this century are indicating.

EP: Bearing in mind the existing data, what are the projections for the following period as far as the availability of the amount of waters in our country is concerned?



Nebojša Veljković: Serbia has plenty of water, and it can be found on the European list in the group of countries with 'medium affluence'. The disadvantage of our water resources lays in the fact that the largest amounts of these waters, even 92 percent, are transit waters, which flow by the rivers from the territories of other countries or make an international border – the Danube, the Sava, the Drina, the Lim, the Tamiš, the Tisa, the Begej. The basin of the Južna Morava, the Zapadna Morava and the Velika Morava, which we administratively call central Serbia, annually collects water, in the form of rainfall, which flows through the Velika Morava. Just before its confluence into the Danube on Ljubičevski bridge it has 22 times less water than this big European river, to which 'our' waters are handed in and thus together go to the Black Sea.

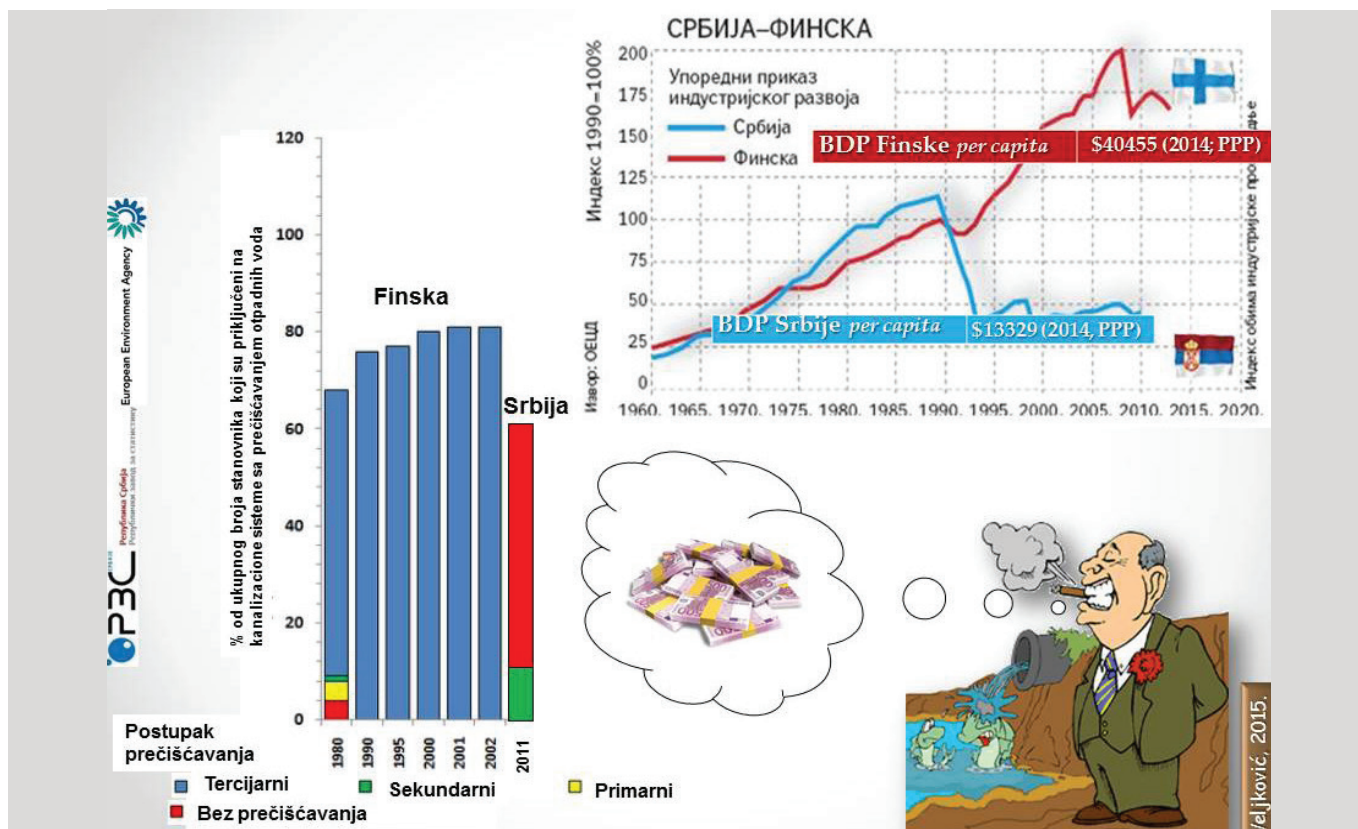
To make things even worse, the analyses show that the average flow of the Velika Morava at Ljubičevski bridge has decreased for 18 percent in the period from 181 to 2010 compared to the period from 1951 to 1981. We have less and less of our water resources, since the demographic projections show that in Serbia will live the same number of the population in 2050 as in 1950. The higher number of population does not necessarily have to mean the greater consumption of resources, but the increase of consumption per capita is more critical and that is the factor which represents the greatest pressure on the environment. A good example would be the irrigation system in Serbia. Statistical studies show that only 17 percent of arable land is irrigated in Serbia, while Hungary and Slovenia irrigate 50 percent of arable land, and Greece 82 percent in comparison to the entire arable land equipped with the irrigation systems. Such a low level of the resource utilization has led me to do one free projection of the necessary amount of water for irrigation and I will present it in a meeting of experts. I have started with the assumption that we will increase the irrigated area to 50 percent by 2020, and to 80 percent by 2030 in those areas which are now equipped with the irrigation systems. This increase is entirely in accordance with the strategy on agricultural production development, but this approach also takes into account the consumption of water. The increase from the current 17 percent of irrigated area to 80 percent in 2030 will increase the amount of gripped water for the required irrigation for a billion of cubic meters of water per year compared to the current need. This is the amount of water which corresponds to the average annual flow of the Južna Morava in May. In other words, for the increase of agricultural production, we need one more Južna Morava. This is a good and simple illustrative example of balance sheet and projections of necessary amount of water and it opens up a crucial issue on which we have to give an answer in strategic documents. What is the amount of water which we have at our disposal for what kind of production and consumption and how much of it will be satisfactory and when?

EP: *What can you tell us about the water quality in Serbia, the systems for treatment and the fact that water flows were cleaner during the 90's when domestic industry was destroyed? Since you are the author of the method 'Serbian Eater Quality Index', could you present to us the data from the last 15 years?*

Nebojša Veljković: Serbian Environmental Protection Agency has developed the indicator for Serbian Water Quality Index for the assessment of the surface water quality. The indicator is designed for reporting to the public, experts, political decision makers and it has been adopted by the relevant by-law. Serbian Water Quality Index is a composite indicator which is made up from 9 physical-chemical and one microbiological indicator of a quality with whose aggregation the quality of water obtains the index water quality ranging from 0 to 100. The quality of water is depending on the corresponding index points classified in five categories: excellent, very good, good, bad and very bad. In our reports, which we regularly submit to the Government of Serbia every year, the results of the analysis for large basins and rivers are presented in details and they also contain the overview of the quality since 1998. The best quality has the basin of the Sava with the Drina and tributaries whose 90% is in the categories excellent, very good and good. Waters of Vojvodina have the poorest quality, which include the water flows and canals of Danube-Tisa-Danube and in this are 44 percent of samples are in the categories bad and very bad. The river Danube, thanks to a huge receiving capacity and the possibility of self-purification, shows solid quality, since only 4 percent of the sample is in the category bad and non in the category very bad. Method Serbian Water Quality Index is suitable for comparative studies ad modelling and in that sense I have performed one research which is the continuation of my dissertation and it represents pioneer work in the field of so-called separation of economic growth from the environmental impact. I would single out only the part which is related to your question from this voluminous work. Analysis of our watercourses quality as a recipients of municipal and industrial waste waters for the period from 1981 to 2010 shows three cycles clearly expressed. The first cycle, the 80's with the trend of quality deterioration towards the 90's; the second cycle shows the significant increase in quality up to 2000, and the third cycle after 2000 shows mild decline in quality. These three cycles are entirely in accordance with the industrial development of Serbia. The increase of industrial production scope follows the deterioration of receiving water quality and vice versa. This analysis can be supplemented with a comparative overview of the industrial development and coverage of the sewage system for the population with the treatment of waste waters. This comparative overview is given for Serbia and Finland and it presented the industrial growth in the last half of the century. The current level of population's sewage system coverage is 60 percent and only 10 percent with the treatment systems which date back from the 'golden' 80's and it indicates that in this comparative analyses we weren't better than Finland even when we had larger scope of industrial production. From which funds will Serbia now finance the construction of the plant for wastewater treatment?

According to our by-law from 2016 which took into account the request of Water Framework Directive of the European Union, we are obliged to construct all the plants for wastewater treatment for settlements whose population is above 2,000 of equivalent inhabitants by 2040. Today, there are 26 communal plants for wastewater treatment in Serbia, and it is necessary to build around 200 for settlements which have from 2,000 to 5,000 equivalent inhabitants and around 100 settlements which have from 5,000 to 10,000 equivalent inhabitants.





Comparative graphic chart of the Industrial Development of Serbia and Finland

The total number of plants for settlements of all sizes is around 400. So, we need to build 300 plants by 2040 in settlements which have up to 10,000 inhabitants, and those are the poorest municipal centres. Can all these necessary capital investments be covered from user fees in those settlements? Now, certainly not, since all the public communal companies provide services above the economic price and that means that have operating losses. There are two ways for financing the construction and functioning of communal plants for wastewater treatment. The first one is the construction by using commercial loans at the expense of a local self-government with the state guarantee, where the final cost is shifted to the taxpayers. The other way is connected with the functioning of the built systems in which we have the increase of fee for the costs of the treatment incorporated into higher service fee, which represents direct cost of the consumers or it is shifted indirectly to tax payers, that is users through the subsidies of a local self-government. There is also the third way, which is now applied to some of the existing 26 plants for the treatment of wastewater; in this way the prices of the communal services do not increase because the plant is simply not operating. The terms of negotiation process for the accession to the EU within the Chapter 27, which are related to the environment, are very clear. Bulgaria and Romania have already been paying high penalties for failing to perform obligations.

EP: Statistics show that around 30 percent of water is lost in water utility systems. What can we do in this field in Serbia in order to improve business efficiency of water utility companies?

Nebojša Veljković: The indicator 'water loses' about which you are talking about reflects the reaction of society since it evaluates the efficiency of managing systems for water supply and it includes technical requirements which affect the condition of the pipelines, the price of water and the awareness of consumers about the importance of water as a resource. The characteristic of the present public drinking water supply is high losses, as you have mentioned around 30 percent and there is an increasing trend. In this way 230 million cubic meters of water are 'lost' annually, which corresponds to the equivalent of 45 MW of the installed hydro power plant which delivers electricity in order to engulf and deliver that amount of water. By reducing water loses in Serbian water utility systems only for one third, we would save the electricity which jointly produce HPP 'Ovčar Banja' and HPP 'Međuvršje', that is 13MW of the installed power of these hydro power plants. Another indicator of resource efficiency of water utility systems in Serbia provides a special comparative picture. According to the previous ten-year statistics data the losses of water are increasing and at the same time the delivered amounts of drinking water from public water supply systems are decreasing. When you put the data on gripped amounts of water in ratio with the number of employees, you obtain the indicator which shows that one employee in German water supply produces 3 times more than his colleague in Serbian water supply. It is a measure of the business efficiency. It is enough to see clearly that the efficiency increase of the public communal companies in the field of water supply and sewage can be achieved only by improving the level of services, reconstruction and development of infrastructure which is not possible without the development of local economy and country as a whole.

Interview by: Vesna Vukajlović

LET'S START with Ourselves

The occasion to talk with a representative of the Austrian Embassy about water management is a project that is currently in progress on the part of the Danube near Golubac and Veliko Gradiste. Our interlocutor is Mr. Christian Brawenc, attaché for agriculture, forestry and environmental protection in the Austrian Embassy. The title of this comprehensive project is "Socio-economic development of the Danube Serbia Region", and it is only a part of the activities in the Danube countries. By signing the letter of intent between the Government of the Republic of Serbia and the Austrian Development Agency, the continuation of works on the reconstruction of the Golubac fortress was provided. The Austrian partner will invest 800,000 euros and it is supposed to be finished on 22 July 2016. The funds were spent on the reconstruction of the palace which is located within the Golubac Fortress. It is an EU funded project with a total of 6.5 million euros and implemented by the Austrian Development Agency. Because of the problems with the project documentation, all the work on the reconstruction of the fortress was not completed till 22 July this year and now we learn about the further course of action. It was necessary to ensure the continuation of the work and it was done with signing of this document. Meeting with the Austrian diplomat was very important for Energy Portal since we learned about the details related to water management in Austria. While the World Health Organization warns that water will become a resource in deficit and that 1,1 billion of people have no access to drinking water, we get the fact that Austria will not have problems with water supply and that thanks to its geographical position almost 100 percent of the population has access to water of exceptional quality.

EP: "Socio-economic development of the Danube Serbia Region", a four-year project is in progress. It is funded by the EU and the Austrian Development Agency and the focus is on Veliko Gradiste and Golubac. Tell us more about this project.

Christian Brawenc: The implementation of IPA 2011 project "Socio-economic development of the Danube Serbia Region" was partly financed by the Austrian Development Agency. It was finalized pretty well in June 2016. According to the technical documentation and the reasons for budgeting in the EU, the renovation of the medieval Golubac fortress will be continued in phases. For now, we can sum up the work as follows:

1. The EU Strategy for the Danube Region was created and well accepted. (Full title: "Danube-Serbia: Building a European Gateway"). This set the basis for the accompanying marketing plan and the plan for the reconstruction of the building. It was approved by the Working Group for the Danube Region.



2. We have designed a territorial marketing strategy, a marketing plan for a tourist destination, marketing tools for municipalities as well as marketing products. All this was elaborated by DCC (Danube Competence Centre) in consortium with Horvat HTL.

3. Seventeen projects were selected and they were assigned support from the IPA and ADA grant scheme until 30 June 2015. This grant scheme created 2.160 jobs. Then, the training was conducted for 2.748 people, and a new, better business infrastructure was created. 18 new services to support small and medium-sized enterprises were developed, 39 different training courses for employers were conducted, 22 facilities were built for the initiative of small and medium-sized enterprises, 38 different sets of training courses for the unemployed were organized and at least 18 new tourist services and guides. Likewise, 46 facilities for participants in tourist industry were realized, 6 different types of tourist infrastructure were improved in areas where tourism is developing, where economic growth and sustainable development initiatives are being supported.

4. ADA has prepared evaluation reports for 13 projects selected from the inner circle of relevant strategic projects that were also listed in the strategy for the Danube region ("Danube-Serbia: Building a European Gateway"). All 13 evaluation reports were sent to the relevant stakeholders of the public in Serbia for comments and feedback.

5. The project for water supply in Veliko Gradiste provides water supply in the eastern villages around Veliko Gradiste covering more than half of the population. This will further ensure that Silver Lake has a stable water supply. Furthermore, a good tourist offer will be prepared and it will provide development in one of the "cornerstones" of the tourist potential of the Danube region. These activities have enabled the drilling of new wells, the installation of a water treatment plant, pumping station and reservoirs with main and distribution pipes. Rehabilitation of Golubac Fortress and the environment will be finalized through



the following components:

- Road tunnel of 125 m including a meandering path
- Renovation of Golubac Fortress completed up to 40 percent
- Two houses completed within the visitor center (without interior and equipment)
- The rich archaeological material which became the basis for the future archaeological park
- Technical infrastructure of the tourist zone which was built around the fortress
- Raising the dam on the banks of the Danube which was completed.

EP: What else would Austria like to give its financial and programmatic support to, when it comes to environmental protection in Serbia? Can you state some other projects?

Christian Brawenc: During the stay in Vienna, we had meetings with your Ministry of Agriculture and Environmental Protection about waste, recycling and the benefits of recycling. We believe that it is very useful to educate children in schools with the aim to develop habits how to deal with dirt, pollution, how to avoid jeopardizing the nature and the like. On this occasion we had a presentation of our system in Austria and explained how children learn about the environment and how to preserve it in elementary school. We would be happy to share our experience with children in Serbia, because we believe that this is the best prevention. Pollution should be prevented when children are small and they should know the consequences. That is how you take precautions to avoid endangering nature. We see this as a very useful activity. If you take a closer look at the situation in Belgrade or in Serbia, you have to admit that the awareness of recycling and waste separation is not at a high level. That is another area where we can invite experts to come here and pass the experience on how we should all treat plastic, glass, metal. These are the main recyclable goods, valuable materials that you can re-use, create a new bottle or a new can. I think you need good examples, useful "know-how" in order to protect the environment and treat the waste properly.

Another thing which is very important is to start with major infrastructure projects. It is essential to fund such projects. It is essential to fund these projects, but that is way beyond our means. A plant for the separation of waste must be built and afterwards produce electricity from waste. I know that there are such projects and intentions. I also know that one Austrian company is interested in these jobs. That company wants to bring technology and "know-how" to Serbia. We hope that there will be major projects in the sector of waste management. What I see



as a citizen is that we should stop producing garbage. For example, when I go to the supermarket, a cashier hands me 5, 6 or 7 plastic bags and maybe I need only one. I may have a basket or a canvas bag, but she insists on those plastic bags. Plastic is very harmful for nature. When you go from Belgrade to Novi Sad, you can see piles of plastic bags in the fields, in the trees... so, it costs nothing to start at some point with yourself and your behaviour. Just bring a bag and explain in each shop that you do not need a plastic bag. Also, when I go out for a drink on the Sava or the Danube, the first thing I see is that plastic bags are swimming around us. You really need an hour and a half for your employee to pick up all those bottles that water brought around the floating river clubs.

EP: What is Austrian experience in water management, control of waste water discharge and water treatment?

Kristijan Brevenc: When we talk about Austria and water management, we are organized in a few sectors. We have a sector for water protection and a sector for the protection from water and flooding. Austria is a country where the alps dominate, but we have plains as well and the protection from floods is very important, when you know that it is possible that the water level suddenly increases. We are lucky that Austria is a country very rich in water, we have plenty of spring water and rain water. Thus, the quantity and the quality of this water is excellent, so it can be said that we are rich in this resource. We have enough for all purposes – agriculture, industry, domestic use and for drinking. We use only 3 percent of the water that is on our disposal. When we talk about water conservation, our principle is to forestall any pollution and adverse effects on water sources at the start. So we will not have to implement sanitation methods after pollution. This is our general approach to water management, both in the industry and in the private sector. Do no harm, avoid danger. In the industry there is a rule – if you want to be a part of this system, you have to obey a multitude of regulations, fulfill a multitude of conditions in order to start with production. Everything has to be done on prevention before entering the system and before using water. In Austria, 90 percent of the population receives water from public sources, from the local water supply. We have built and rebuilt 70.000 km of water pipes. We have improved the whole system which is about 50- 60 years old. On the other hand, there are waste waters. When it comes to them, as much as 95 percent of our population has access to the system for treatment. The whole country is covered with the purification system. The main steps were taken 30 years ago. In the seventies the half of the population was not connected to the sewage treatment plant. Our lakes are perhaps the cleanest in Europe, it is almost the same quality of drinking water. As we are an EU member since 1995, everything we do is financed from EU funds. As an important project I would emphasize agriculture that has to be "ecofriendly". Farmers will receive assistance and financial resources if they have ecological "friendly" approach. It is important what kind of fertilizer is used, what kind of irrigation you have, everything you do has to be positive for the environment, CO2 emissions should be reduced.

Interview by: Vesna Vukajlović



BAJNA BAŠTA

Has Achieved Results above Expectations

Energetski portal had a chance to meet Mr. Levan Pivnevi who is an independent advisor or Project Manager at the Dutch Embassy in the field of PIB (Partnership for International Business) management projects. He works and lives in Belgrade with his family. He has Georgian ancestry and was schooled in chemistry. For the last four years he has been engaged in international consulting, and before that he worked in the private industry. He currently represents the interests of Dutch companies that specialize in the field of wastewater management and remediation of contaminated water. Through IMG – International Management Group in which he is engaged independently of the Dutch Embassy, our interlocutor is engaged in the management of solid and household waste. It is a group which is established in 1994 as an initiative of UNHCR. Back then it had an intention to help ad hoc in Bosnia and Herzegovina regarding technical and infrastructural problems encountered during the conflict in the former Socialist Federal Republic of Yugoslavia.

Levan Pivnevi: At the moment the PIB – Partnership for International Business project is ongoing and it was recommended by the Dutch Embassy. The PIB is a program of the Dutch Embassy that offers assistance in practical and technical solutions for developing countries and it refers to waste water. At the same time, it monitors the implementation of the project in the field. I should mention that such a project has been finished in Brazil on the eve of the Olympic Games. There are also numerous activities in Asia. This is all new for Serbia. The start of PIB project was supposed to be in June, but due to subjective and objective circumstances it was delayed for the end of September. The ceremonial beginning should be organized with the focus on Vojvodina. There is an interest to encourage other municipalities in Serbia with this project.

As far as for SIDA - Swedish International Development Cooperation Agency, their project deals with the issues of communal waste and it has the support of Ministry of Agriculture and Environmental Protection in Serbia. The Government of the Republic of Serbia has officially addressed to Sweden for help and construction of regional center for communal waste management. We are talking here about the center 'Duboko' which is located in Užice. Apart from Užice, Čačak and 7 more municipalities are included. Mr Pivnevi was engaged in this project for 2 years, and he has just finished his final report. September was also identified as the term for the start of the second part of this project. That part will be implemented by a young, new company, but the consultants will stay the same.

EP: *Let's talk about the PIB project which is focused on Vojvodina. You are responsible for the communication with business sector and companies. What exactly*



Levan Pivnevi

is your task? What are the goals of the project? In what way are the stages of the project defined and what is the time of its implementation?

Levan Pivnevi: The project lasts for 30 months, with a trial period of 12 months. In what way it will develop depends on the Dutch Embassy, companies and me. I am not alone in this project. The professor from the Faculty of Technology from Novi Sad Mrs. Mirjana Miloradov is in the team and she is in charge of G-to-G Relations (Government to Government). This practically means that this is a governmental project and that the experience in waste water management are exchanged. It means that the municipality from the Netherlands has presented its achievements to the municipality in Vojvodina. On the other hand, I am in charge of the Dutch companies which have extensive experience in remediation and management of waters. I can tell you that I cooperate with large companies on the projects which are worth millions of euros and which have several thousand of employees, but also with small companies. My task is to find some projects and partners for them here in Serbia. My goal is also to engage public sector, since there you need the help of experts. I should also find local partners. It can be any registered company, which deals with consultant companies, and it can also be a domestic company which has foreign employees. Then you should make a consortium with Dutch companies. After that, you look for funding together with municipality or public company. The best models for European projects are IPA funds or Horizon. Partially



even the municipality itself can bear the costs. There are many things that should be done in the field of waste water management, remediation of contaminated waters and soil in Serbia. I don't mean only in the infrastructure, but also in the domain of ideology and the system of charge. There are plenty of things that should be done. Everything depends on the level of the municipality's development and whether it can join the project or whether the Dutch Government had any contact with the municipality before. If the municipalities are not taken into account, then we contact Water Supply or Ministry. Mrs. Mirjana takes care about the contacts and she has more precise information. There are many channels that haven't been cleaned for a long time in Vojvodina, and that water is extremely contaminated. This is a brief outline of my job description.

EP: Does this PIB project imply the construction of a new plant or change of filters or pipes is performed in the period of 30 months? Do you only need to make a contact or cooperation with public sector in Serbia or to achieve a specific effect?

Levan Pivnevi: We don't do only the analysis, this kind of data we already have at the Faculty and that kind of statistics is at the solid level. The Netherlands is, on the other hand, the number one for the waste water management in the urban areas. I have to say that I enrolled an online course at a Dutch University on this topic. They have practical experience and solutions. Therefore, our goal is to find a project, a job which we can work on. For example, Subotica has a problem with drinking water which is salty. There we should apply the technologies and methodologies for water treatment.

EP: What have you achieved with SIDA organization and how did you complete the projects with municipalities regarding the solid waste?

Levan Pivnevi: The plant of 'Duboko' center started working in 2013. I have also mentioned 2 towns and municipalities: Čajetina,

Arije, Kosjerić, Lučani, Ivanjica, Bajina Bašta, Požega. They are the co-owners of the regional landfill, and there we had several different problems. We should increase the amount of waste collection, the primary selection which has begun everywhere but in Požega, Lucani and Kosjerić. The transfer station did not exist, the rolling stock is old... The Ministry has turned to us for help since the existing landfill was quickly filled up. There was also the landslide, all in all it was highly risky. Each regional landfill is planned to exist for 20-25 years in Europe. We made an assessment whether it was cheaper to expand the landfill or relocate the existing. The first option was cheaper and we made a technical analysis, then we invited a Greek company to participate in a tender. So far the municipality of Bajina Bašta has performed the best implementation. They achieve two times better results than it was planned. They have the initiative starting from the mayor himself to the public companies. 100% of population is included in the waste collection. The result of Serbia is 1.2 % of waste recycling, and Bajina Bašta achieves 15%. I have to congratulate to Bajina Bašta on the way they concretized and conducted the project. They have built 2 collective centers. Those are auxiliary areas of the utility companies, where the population brings the waste. If you want to throw away the bulbs, car batteries, glass, electronic waste, and other things, now you can do it in Čačak and Bajina Bašta as a result of our donations.

Our interlocutor was born in Tbilisi, which reminds him of Serbia in many aspects of life, and he thinks that it is more difficult to restore order in urban areas. In rural areas, organic waste is still used, then solid and wet waste is not mixed, and in any case there is less waste than in the cities. In the city, everything is thrown in two marked containers. People do not consider training and education as something concrete, something that can be caught by hands. However, the truth is that in that way we can reach every individual. One must go step by step, separation of waste must be stabilized, habits changed and finally separate the waste raw materials into solid and wet, organic and constructional.

Interview by: Vesna Vukajlović



THE LEGAL FRAMEWORK IS GOOD

Enforcement Is Bigger Problem

“Hrabri čistač” is a non-profit association which brought together leading companies in the field of waste management in Serbia. It includes companies involved in the treatment of hazardous waste, waste disposal, recycling industry and converting waste to energy. “Hrabri čistač” is also the only association in the countries that are not members of the European Union, which is a member of FEAD. It is European Federation of Waste Management and Environmental Services that covers 20 countries. In June “Hrabri čistač” participated in the FEAD forum in Munich and our interlocutor Ms. Sandra Kamberovic conveys her impressions from that meeting. Ms. Kamberovic is General Secretary of “Hrabri čistač”. We have learned a lot from her about the functioning of FEAD members and about the general situation in Serbia when it comes to waste management.

EP: The National Strategy for Waste Management was made 6 years ago. The law has been amended this year and it is precisely defined what is no longer waste. What is your opinion on this legal framework? What is the significance of waste in the circular economy in Serbia today?

Sandra Kamberović: Waste management is the activity of public interest. From the standpoint of practice it is expected that everything is written in one law, which is impossible, especially in the sector of environmental protection and waste management. Our laws are good. They have always been made in accordance with European good practice. The regulations governing waste management are dynamic for several reasons – technological advances, “moving targets”, the new institutes for our society, as well as new ways of waste management, that is recycling. The legal framework of the Republic of Serbia for waste management is essentially good, but enforcement and the capacity of the administration is a bigger problem. Unfortunately, there are certain provisions in a legal vacuum, which actually leads to problems during the implementation. I believe that these difficulties will finish by the end of this year and that by 2018 we will have a stable legal framework for new investments. In the regulatory process the period for the adoption of implementing regulations based on the law is of a disproportionate length of time which is not good, and it was indicated by the very practice of the implementation of regulations. The main problem is that there is no continuity in the creation of regulations and there is no mutual permeation of regulations in the implementation. What is clear so far is that the administration continually postpones the obligations they undertook. What decision-makers in the sector of waste management



Sandra Kamberović

are lacking in today is consistency in planning and implementation, as well as in the analysis of the effects of implementing regulations. It is essential for the investments in the waste management sector. We should not forget that the burden of investments will be borne by the private sector and citizens and therefore coordination, planning, transparency, teamwork and consistency in implementation is of great importance as well as the cooperation between government and private industry. The European Union adopted the package of measures of the circular economy in December 2015. With this package of measures, it was decided that only 5 percent of municipal waste can be left on landfills; that is, this package of measure aims at maximum utilization and conservation of natural resources. This is a new ideology of the EU, very ambitions and it is still being debated about. Circular economy brings new jobs in the process of waste management, new technologies and the promotion of eco-design. This means a lot of work for the Republic of Serbia, both in administrative sense and in terms of the implementation of regulations, which means that we should consider waste as a resource. In order to be able to talk about proper waste management we need institutional support, the reform of utility companies, primary separation of waste, inclusion of vulnerable groups, sanitary landfills, revenue policy and extended responsibility of producers.

EP: It is estimated that between 230.000 and 460.000 tons of waste is produced in Serbia. This applies to



hazardous waste, industrial, medical, and household waste. What should be the fate of this amount of waste in the regulated system, and what was the practice in Serbia so far?

Sandra Kamberović: The fact is that the amount of waste from households per capita grows each year. We have waste in industry as well, but the problem is also how to deal with products that become waste after use, how to deal with industrial waste and how it should be treated and disposed of. It is necessary to introduce a landfill tax as soon as possible which will contribute to establishing a system for proper waste management. When we establish a landfill tax, we will solve the essential problem of waste disposal, but also the problem of improper waste disposal. Through this economic instrument the problem of waste increase should be reduced in percentage, year in year out. We should not forget the problem of historical pollution. The state is responsible for the rehabilitation and 35 million euros should be allocated for it annually. Waste, especially hazardous waste should not be mixed with non-hazardous, as in the case of improper disposal we have only hazardous waste.

In time to come we will have a primary separation of waste and we will learn what is hazardous waste, how it should be disposed of and how much we are all responsible for our habit to have only "one bin". We need to know what are the consequences of such behavior. The process of raising awareness on hazardous waste, its proper disposal, establishing a system of primary selection at all levels and the continuity in developing the habit to separate waste by type will be our major contribution to our immediate environment in which we live. Today, a lot of attention is paid to eco-design, that is to the minimization of the substances that contain hazardous matters, as well as the application of the principle that the polluter pays as one of the basic principles of waste management. In developed societies hazardous waste from households, but also industrial waste cannot be mixed, and a special attention is paid to hazardous waste from households and to the manner of its special disposal. Medical and pharmaceutical waste is a particular challenge which will be solved in the future. Recently, these issues have been discussed in the context of amendments to the Law on waste Management and by-laws that yet have to be prepared. In the Republic of Serbia historical waste is a major problem. Remediation of historical pollution and remediation of land was never paid enough attention to. It is one of the preconditions for the prevention of health in a country, prosperity of the society, the development of market and industry.

European, but also national regulations define extended responsibility of the producer for the product that becomes waste. In our country the system of implementation of this mechanism is in its infancy, producers pay an eco-fee for products placed on the market, which is used to take care of the products after use. However, for now, the system is not strong enough to develop this mechanism. This situation produces dissatisfaction and stagnation of the market and the development of green economy, because there is no so called "ring fence" system which prevents the misuse of money collected for specific purposes, that is for specific waste streams. Great expectations for solving this problem are laid in



the constitution of the Green Fund.

EP: *Association "Hrabri čistač" is a member of the association FEAD. Recently the forum was held in Munich "Does the waste market in Europe need greater liberalization or more regulations?". Can you please tell us something about the conclusions and future plans.*

Sandra Kamberović: FEAD is a European federation which represents the European waste industry. FEAD's members are national associations from 20 European countries dealing with waste management. They have about a 60 percent share in the household waste management and they process more than 75 percent of industrial and commercial waste in Europe. Their combined annual turnover is more than 75 billion euros. FEAD represents about 3,000 companies in their waste management activities. Collectively, these companies employ more than 320,000 workers, have about 2,400 centers for separation and recycling, 1,100 centers for compost, 260 plants for converting waste into energy and 900 controlled landfills.

EP: *What does "Hrabri čistač" do at the local level? What are the effects and results of these efforts? How are the members organized?*

Sandra Kamberović: The association of Serbian waste industry "Hrabri čistač" defined its priorities in February: the fight for troubleshooting historical pollution, solving the problem of illegal dumps, introducing landfill fees and the development of the recycling industry according to the market principles. Members of the Association are the leaders in the national market of waste industry. Our goal is to help the national industry in the process of transition and development of this young industry in accordance with international and European regulations.

The Association is very active at a local level, through various forums, seminars and bilateral meetings. All this with the aim to establish a waste management system. Local governments are the main bearers of deployment and implementation of national policy for waste management.

Interview by: Vesna Vukajlović



IT IS DIFFICULT but We Should not Make Compromises

Serbian Recycler's Association owes its persistence and consistency partially to Mrs. Ana Petrović-Vukićević, who had obtained the title of the 'Best European' last year. Years back, 'Serbian Recyclers' appeal that citizens should be financially stimulated to separate recyclable waste. They have pointed out the importance of compensation payment for processed waste, they have declared argumentatively last year in a public hearing 'Recycling in Serbia'. They have explained that with the abolition of the Fund for Environmental Protection in 2012, funds have become smaller, thus 25% less waste was processed compared to the previous period. Here is what our interlocutor says about these topics after Amendments and Supplements to the Law at the beginning of 2016.

EP: Can you comment on the new Laws on waste management, dangerous waste, dangerous waters and evaluate whether the problem is the absence of Law or breaking the law? What is your assessment of the situation in Serbia when it comes to systemic waste management and recycling?

A.Petrović-Vukićević: Amendments and Supplements to the Law on Waste Management, Law on Environmental Protection and Law on Nature Protection were brought in February 2016. These Amendments and Supplement represented a further alignment of the existing legislative framework with the newest EU directives and standards, which was our commitment according to the agenda in the negotiating process. In that sense, the legislations do exist; largely harmonized with the European, but a big problem is their implementation, enforcement, continuity of enforcement and inspections, as well as sanctions for non-compliance of legislative norms.

Currently, the major problem is that we have not yet begun the development of by-laws for the newly adopted Laws due to the election processes and the formation of the new Government. The working group for the development of by-laws was formed at the end of March with the deadline till October to develop all the documents in order to start the implementation of the by-laws by 1st January 2017. The functioning of Green Fund will start on the same date. Unfortunately, up to now not a single meeting of working group has been held, and that is in my opinion a great problem and a pity. I can't see the reason why wouldn't the technical Government deal with these issues which are technical and which provide enforcement of the adopted laws and it would mean a lot for the economy since it would improve the business conditions which are enabled by some new legislations.

EP: You can often hear that inspection, more precisely



Ana Petrović Vukićević

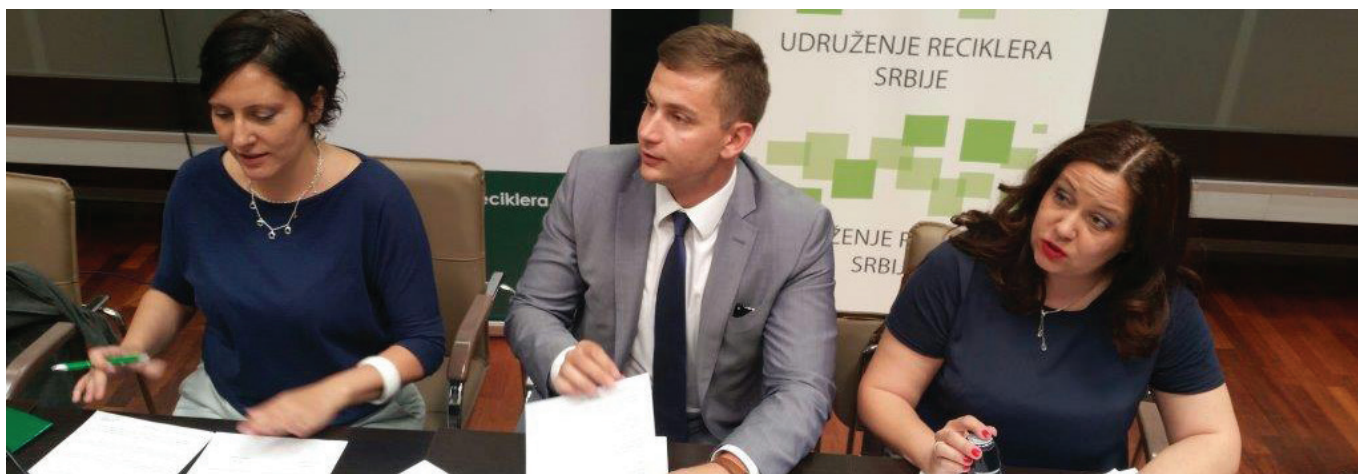
the reaction of state authorities is inadequate and that the system should be more organized in sanctioning violations of the Laws. What is the fastest, the most efficient and the most acceptable way in which this area could be put into order according to your opinion?

A.Petrović-Vukićević: The Law must be equal for all, which is the basic feature of the legal states. We cannot allow that the conscientious polluters who pay eco taxes put up with unfair competition of unscrupulous polluters who are not paying their obligations to the environment and for that they do not bear any sanctions. The eco taxes charge is minimum 4 times bigger than the current charge and that is a particular issue. We, as the Association, have to make sure that all charged eco taxes are used exclusively in the field of environmental protection. And that is also because each dinar invested in recycling industry and environmental protection is returned 3 times in the industry and 10 times in the costs of treating human's health due to consequences of pollution.

We have already made several suggestions to the State, as the Association, in what way we could enforce the mechanisms of charge when importing and the first placing of domestic goods in the market. So, the solutions do exist. Implementation is relatively simple, but the problem is whether we will have enough of political will and executive strength to conduct it and that is something we will see in the following months.

EP: The negotiations with the EU and the Chapter on Environmental Protection and Climate Changes are extremely demanding and it covers a wide area. What are our capacities for the implementation of all these alignments in your opinion?





A.Petrović-Vukićević: It is expected that the Republic of Serbia raises the awareness of the citizens to a certain level, so as to understand that the investing in recycling and environment is primarily the prevention from the worst diseases. Then, it is also expected to work on meeting all the standards of environmental protection, especially in the field of wastewaters. According to the analysis of western experts, it is necessary to invest more than 200 million euros in the field of wastewaters by 2019 in order to meet the required standards. This analyzed investment is related only to the protection of waters and separation of waste. Another, not less important thing is to develop a primary selection and separation of waste. In other words, it is necessary to start separation of waste and selection of the waste from household onwards. We, as the association, have a cooperation and we had meetings with the negotiation team and Mrs. Tanja Mišćević. This is how we contribute to the perception of problems from practice, real life and the economy and we are very satisfied with that cooperation. We haven't been included in the negotiation process in formal terms. Certainly we have a consultative role. The representatives of the negotiation team of the relevant Ministry are ready to listen to our problems and our perspective of things. In this context, they can take into account what is real out of all that we want and what will be our obligations. Therefore, at great extent we would avoid the penalties to which young member states were exposed to when they entered the EU and now they pay an extremely high price due to that.

EP: What else can be improved? What would be social gain from recycling if the society accepted this way of thinking?

A.Petrović-Vukićević: We could certainly improve the scope, technique, technologies of collecting (there I mean primary selection) and recycling, as well as the plants for waste. According to the EU Directives, we are obliged to stow all the waste created on the territory of Serbia after 2020. Recycling industry is based on 3 pillars of sustainable development and it is also a prerequisite of circular economy. It allows a large number of jobs for marginal social groups which cannot find jobs in other agricultural branches which are rapidly developing in technology and which are difficult to keep up with. Recycling industry preserves raw material base of one country and what is more important it preserves environment from further ruining.

It is impossible to financially express how much we actually save by investing into preventives, environmental protection in relation to the costs which the state has for the treatment of most difficult diseases that are direct result of the pollution of water, air, soil and food.

EP: Could you tell us all the things that Serbian Recycler's Association does in this field? Since you are the winner of the award 'The Best European' for 2015 for the activities in the field of ecology, can you tell us how did you get it? What is the focus of your personal engagement and interest?

A.Petrović-Vukićević: Serbian Recycler's Association gathers 18 biggest recycling companies in our country. Our goal is to promote the principles of environment through joint activities of collectors and recyclers and to continue the development of recycling industry through a partnership with the Serbian Government. This job is neither easy nor simple. I would say it is a pioneer job and at great extent based on the enthusiasm of people, since the problems are so big and complex, and the windmills with which we fight against are so strong and persistent that from time to time I really don't know where from we draw strength. And we acquire strength because we know that we are fighting for the right goals, which represent general interests for all the citizens of our country; that we are fighting for healthier and more humane surrounding in which our kids will live, since you cannot give up from the righteous attitudes and goals no matter how difficult it is.

As for the award it was a completely pleasant surprise for me. It seems that someone was watching what we were doing and how much courage, dedication and fighting we showed in public debates, parliamentary hearings, public performances and working groups; that we weren't afraid to say and demand the things for which we stand for even there, where it wasn't so popular and thus risking to get into unpleasant dialogues and argumentative debates. We have always believed that we have enough strong, righteous, honorable and moral principles and goals for which we fight for. In order to protect strategic national interests, which environmental protection undoubtedly is, there mustn't be rotten compromises and I don't have them with any exception.

Interview by: Vesna Vukajlović



COLLECT, THROW, RECYCLE in Arilje

We present to you the project 'Collect, throw, recycle' which is being implemented in the municipality of Arilje. Every year, around 8,700 tons of solid communal waste is collected in this municipality. That includes metal, plastic, cardboard, packaging and 1,400 tons can be recycled. If, for example, the entire Republic of Serbia implemented this project, 384,000 tons of waste would be recycled yearly. This is the basis for circular economy. What can be achieved with this kind of recycling approach? An XL T-shirt can be obtained from five PET bottles from 2 liters, one new bicycle can be obtained from 500 cans, 1 ton of recycled paper can be obtained from 1.2 tons of used paper and thus prevent 20 trees from woodcutting and so much more. We spoke about this project with Ivan Tešović who is a part of the team in the municipality.

EP: Arilje is included in the projects which the Ministry of Agriculture and Environmental Protection implements together with the agencies SIDA and IMG. Tell us more about the project 'Collect, throw, recycle?' When did it begin? What are your goals? What are the results so far?

Ivan Tešović: Arilje Municipality as one of the founders of the landfill 'Duboko' is the signatory of the contract which regulates the obligations of waste management. One of these obligations is the primary waste selection on the place of its onset, that is waste selection into recyclable and non-recyclable in households for further utilization and reduction of environmental pollution. The Law on Waste Management of the Republic of Serbia obliges the local self-governments on Serbian territory to introduce primary waste selection on the place of its onset.

The municipality of Arilje, in co-operation with the Ministry of Agriculture and Environmental Protection with the support of Swedish International Development Cooperation (SIDA) and International organization IMG, started the project of primary waste selection in Arilje. The contract between the parties was signed in December 2013 and the implementation of the first activities started immediately.

THE OBJECTIVES OF THE PROJECT REFLECTED IN THE FOLLOWING:

1. Broadening includes waste collection in the additional 400 households (20%) in the municipality of Arilje, that is in the following local communities: Virovo, Latvica, Stupčevići, Mirosaljci, Trešnjevica, Dragojevac i Bogojevići,
2. The introduction of primary waste selection on the entire territory of waste collection,
3. Dissemination of knowledge and experience gained through



Ivan Tešović

the project for the sake of the National plan and the program of primary selection in all local self-governments.

Within the project, we have procured two garbage trucks, one for recyclables and other for mixed waste, 2,700 bins for recyclable waste whose volume is 240 liters and 68 containers of one cubic meter. Also, 45 communal boxes for the disposal of recyclable and mixed waste were built on several locations on the territory of the municipality.

As a result of everything, the area for waste collection was also broadened, and thus the amount of waste which is disposed on the landfill 'Duboko'.

When it comes to recyclable waste, according to the data from the landfill 'Duboko', recyclable waste which is transported from Arilje to landfill has an extremely high quality. At the moment 9.44 percent of waste is recycled on the territory of municipality, which is an excellent result for such a short time.

EP: How does the municipality of Arilje plan the continuation and sustainability of this project? What is the response of the citizens and general public?

Ivan Tešović: The municipality of Arilje intends to further develop this project and to use all the potentials that this project brought. Primarily to further expand the area as much as the technical possibilities and conditions allow, as well as to distribute to citizens the remaining undistributed bins. The plan is to build in the future a modern reloading station and a recycling island in the municipality.



As regards to the response of citizens, so far we have delivered slightly more than 2,100 bins. All the bins were distributed thanks to good project promotion and communication with citizens, without the application of measures envisaged for households that do not take their bin. Municipal decision related to the management of municipal waste contains certain penalty provisions, but they have not been applied yet.

EP: *What were specifically your activities during the project? How many people did the municipality hire? Did you collaborate with the NGO sector or utility companies?*

Ivan Tešović: The municipality of Arilje, as one of the partners within the projects has been dealing with the everyday activities of the project's implementation. For example, some of the activities were the preparation of the report, coordination and identification of the need for changes during the project implementation, as well as suggesting solutions in accordance with the agreement among the participants. The municipality of Arilje as a founder of PUC (Public Utility Company) 'Zelen' is the ultimate beneficiary of the project. The municipality is also the investor, but it has relinquished the management of the investment to PUC 'Zelen' based on the official letter. The municipality has actively participated in all the activities of the project, through its representatives, and also transferred funds from the municipal budget to the bank account of PUC 'Zelen' in accordance with the internal agreement on joint financial participation on co-funding of the project. For the purpose of this project we engaged Project Manager, Project Assistant, Administrative Assistant, Finance Associate and Legal Associate. During the implementation of the activities on the project several meetings with nongovernmental sector were held and we got important suggestions and ideas for the further development of project activities.

EP: *How would the municipality of Arilje organize independently and would it be possible without the support of the above mentioned agencies and ministries? What would be your recommendation for other small towns? What is the key conclusion that you came to during the work? Why didn't recycling obtain higher attention in Arilje earlier?*



Ivan Tešović: The municipality of Arilje has been repeatedly trying to start a process of the waste selection and solving of utility issues on its territory. All these attempts were made with considerably lower funds, supporting decisions and strategies, but also without the experience in the implementation of such a venture. Joint work with the Ministry of Agriculture and Environmental Protection with the support of Swedish International Development Cooperation (SIDA) and International organization IMG, is precisely what we needed in the previous period for the implementation of similar projects. The new approach in considering the problem we want to solve, cooperation with the experts from the field of communal waste management with the development of strategies and municipal decisions on communal waste management have brought the wanted result.

We really have to point out that the cooperation with these partners has been a wonderful experience and a good roadmap for the further activities which we want to conduct.

Our recommendation for all smaller towns and municipalities is to be well prepared before entering into such a project, to meet all legal regulations and provisions, to examine the situation on the field and to choose the partners who will help them to implement the project in an easier way. The most important is work and the desire to change certain things and to make them better. No matter how impossible something seems, with good organization and partners who are always there to help you, you can always find the best solution. All this can be achieved to the satisfaction of all, and above all the citizens as direct participants in the project.

Interview by: Vesna Vukajlović



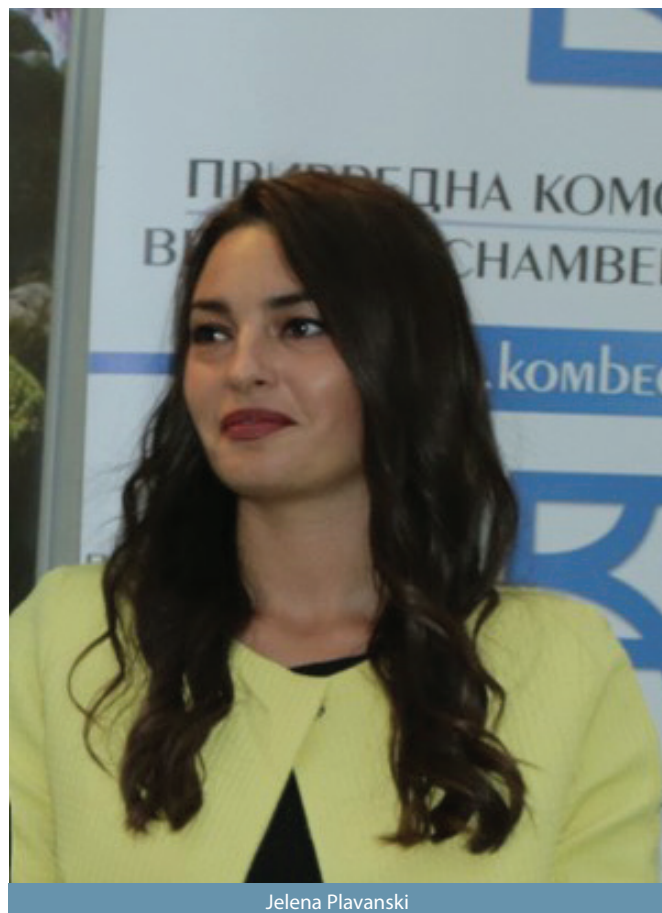
EXPECTED INVESTMENTS

6 Billion for wastewater Treatment

Belgrade Chamber of Commerce, to be more precise Center for Ecology, is one of the most important institutions who gave us detailed information how the business entities should implement the new Law on Waste Management. We also found out what should be accomplished in realistic time and legal framework so that the Law becomes meaningful and the objectives are achieved. Efforts are being made to inform and educate responsible persons in companies in order to meet new regulations, improve the practice and have more positive overall results. Cooperation with embassies, insitutions of the city and national authorities is also synchronized in the realization of these objectives. Mrs. Jelena Plavanski, the Head of Center for Ecology was our interviewee and she conveyed to us her views and details about the activities of her colleagues in the Center.

EP: In January this year Belgrade Chamber of Commerce organized a symposium with the topic of reporting on waste and the manner of achieving better collection of eco-taxes. Can you tell us what has the Chamber done since the enactment of the new law on waste management and which institution does the Chamber collaborate with? What are the effects and the results of the operation of your sector?

Jelena Plavanski: As an economic association, Belgrade Chamber of Commerce organizes all the activities in accordance with the needs of business entities. Thus in January this year at their initiative the Chamber organized a symposium with the representatives of the Agency for Environmental Protection entitled "Completing the daily records and annual report on waste – form DEO 6". It is a form for daily records of waste that came into force on 1st January this year. Given the fact that the topic is up-to-date and the reaction of the Chamber was rapid, a large number of businessmen attended the Symposium. The Form DEO 6 represents a further enhancement in terms of information about the flows of generated waste on the territory of Serbia, within the project "Monitoring the waste flows" which is currently conducted by the Agency for Environmental Protection with the assistance of the Kingdom of Norway. The aim of this project is to gain a clear picture of the quantity of waste that is generated daily and its treatment, in order to improve economic activities. As an institution that represents interests of the economy, we follow all the current events, so as to react on time and inform business people



Jelena Plavanski

or competent institutions about them. In the last year we had the adoption of amendments to certain laws, ordinances and regulations. Belgrade Chamber of Commerce was very active in this period and submitted to the legislative organs a number of comments which reflect the views of our members and the Chamber, as an economic association. One of the most effective ways of preparing and informing the economy about the upcoming changes, which will be brought with EU integration, is the organization of meetings and educational events. In this case it is primarily related to Chapter 27. This field is very extensive and demanding, so in spite of the fact that we have already done a lot as a state, changes and innovations are yet to come. This means that we have a lot of work ahead of us, for which we are fully prepared. We are currently preparing for the upcoming amendments to the laws and bylaws and we sincerely believe that we will be able to successfully influence the creation of favourable business environment. We are pleased to say that we have, together with the business community and also all the other relevant participants in this process, built a relationship based on



trust, as evidenced by daily calls from various parts of Serbia. Belgrade Chamber of Commerce is at a disposal for everyone for consulting, providing necessary information and giving support for problem solving. We sincerely believe that we will, thanks to the relationship based on trust and our desire to justify the role that we have, additionally improve our services and cooperation. The process of adopting a common attitude towards the legal and regulatory acts is sometimes relatively slow, but one always comes up with a solution, because in every situation we are aware of the fact that we contribute to creating a favourable business environment with our own efforts. Belgrade Chamber of Commerce actively cooperates with the Ministry of Agriculture and Environmental Protection, the Agency for Environmental Protection, the Secretariat for Environmental Protection of the city of Belgrade, the Directorate for Waste Management of the city of Belgrade, businessmen who deal with waste management, associations, non-governmental and civil societies and all those people who deal with the protection of the environment or have interest in it. Last year we signed several cooperation agreements, for example Memorandum of cooperation with the Agency for Environmental Protection and the Secretariat for Environmental Protection of the city of Belgrade. All the stated participants actively take part in our meetings. As the Chamber, we are responsible for the Belgrade region, so the cooperation with the Secretariat and the Directorate for waste management is unavoidable which is already showing results. Environmental protection is one of the biggest challenges all over the world, especially at a time when we are all faced with great impacts that the nature

inflicts. As the waste management is a field that has to do with all branches of industry, depending on the type of waste, sometimes making mutual decisions and solutions is not an easy task. But since we all have the same goals, among which is also the improvement of working conditions, in the end we always have a unified attitude.

EP: In February you organized with the support of the Slovak Embassy an Assembly on water purification together with the analysis of the examples from Slovakia and in June you had counselling about a new approach to water preservation in Serbia. You advised businessmen how to perform monitoring of wastewaters in accordance with the new regulations. What are the results of these activities? How do businessmen respond to new legislative changes and what else can be done under the auspices of the Chamber in order to increase the responsibility of the companies?

Jelena Plavanski: Wastewaters represent one of the most important and most challenging problems which should be solved in the following period. Even in the post-screening document which was brought last year, it was stated that the investments in the amount of 6 billion euros are expected in terms of wastewaters. You should bear in mind that all that money and effort which is invested in solving the problems from this field, do not represent a cost, but investment in the better future, prettier and healthier life and nature. Unfortunately, not much has been done in this field in Serbia so far, which means that we are expected to perform many activities in the following period. The





meeting on monitoring was the first step in informing and preparing the economy for this field. The Act which we have presented is only one out of series of acts which are expected in the following period. The focus of all our gatherings is discussion, since through it you have the possibility to obtain the feedback from the people who will eventually have to implement everything we talked about. You learn out their opinion, whether they are good or bad, the things they know or do not know, what they can or cannot do, what are their problems. Our communication with business entities always continues after the meeting. Businessmen call us themselves, since it often happens that they forget to ask some question or give a suggestion during the meeting. Based on the comments and proposals which followed after the meeting on monitoring, and again in the cooperation with colleagues from the Ministry of Agriculture and Environmental Protection, in this case the colleagues from the Department of Water Protection, we have started the development of the specific training program, which will be adapted and which is intended for everybody who will have the obligation to deal with the monitoring of waters. Education should begin by the end of this year, and the invitation will be posted on the websites of Belgrade Chamber of Commerce and the Ministry. When new laws and by-laws are adopted, as well as their amendments and supplements, we will organize meetings and trainings so as to be prepared for all upcoming changes and obligations. The meeting organized in cooperation with the Embassy of Slovakia is only one of the meetings which we have organized with some of the Embassies or some foreign companies, and with the goal of transferring knowledge and experience of the countries which are ahead of us, at least when we talk about European integration,

innovation and new technologies.

In addition to connecting businessmen, these meetings represent the possibilities of presenting our expertise, economic and scientific potential which may not be visible enough, but it is very much present. That is why we, as the Chamber, have a task, in addition to getting to know potentials and possibilities of others, to present our own.

EP: How did you organize the work of the Center for ecology within Belgrade Chamber of Commerce and what are your plans until the end of 2016?

Jelena Plavanski: Centre for Ecology of Belgrade's Chamber of Commerce deals with the monitoring of two very extensive and complex fields, and those are environmental protection and transfer of technology including innovations. Our task is to make sure that the information, obtained from the field on daily basis, are passed to our associations and in accordance with that to organize specific activities. The associations function on the principle of membership. One of the ways of organizing sectorial cooperation with the associations and businessmen is the establishment of appropriate groups. This is how the Centre for ecology in cooperation with the Association of Industry of Belgrade Chamber of Commerce has established the Group for recycling and waste management, Group for the cooperation of science and economy and a sequence of other groups which are related to the areas we follow. The topics of most meetings and trainings occur precisely through the direct communication with them, which is at the same time the role of



the chamber's system. Belgrade Chamber of Commerce has a signed cooperation agreement with the University of Belgrade, with other Universities, as well as with Scientific-technological park of Belgrade founded by the city of Belgrade, University of Belgrade and the Ministry of Agriculture. Currently in cooperation with the Centre for Technology Transfer and Intellectual Property Office we conduct the project 'Motivator' which aims to educate students and scholars in the field of intellectual property protection, technology transfer and entrepreneurship. The project is funded by the American Embassy and it will last one year. The idea for launching this kind of project was insufficient awareness and education of young people, as well as scholars in this field. It is interesting that a large number of participants is interested in the field of environmental protection, so the project represents an ideal opportunity for the preparation and training of young people who want to start a business. This is just one of the projects which Belgrade Chamber of Commerce currently implements in cooperation with scientific community and industry. Since the website of Belgrade Chamber of Commerce is highly visited, the Centre for ecology has made two catalogues intended for companies that deal with waste management. One is designed for the companies involved in hazardous waste management and the other for the ones involved in non-hazardous waste. Catalogues are made in Serbian and English and represent a good opportunity for free advertising, and since the webpage is highly visited that is at the same time a possibility to find future business partners. A series of trainings in the field of environmental protection, education of students within the project 'Motivator', preparation for upcoming amendments and supplements to laws and by-laws, the participation at Eco Fair, as well as many other

activities are planned to be organized by the end of the year. This is certainly just a small part of the things we are planning to do in this field as the Centre and Belgrade Chamber of Commerce.

EP: Belgrade is certainly most developed industrially, due to that it is also the biggest polluter of air and water. There is also a landfill in Vinča. Do you get the proposals and presentations of projects, which would be applicable in our country, in the international contacts with the representatives of China, Slovakia, and Italy? What projects or feasibility studies are those?

Jelena Plavanski: Almost every week Belgrade's Chamber of Commerce gets at least one inquiry from a foreign company. Center for International Economic Relations is a main link in this connection, since they are in charge of the communication with foreign participants. In addition to the countries you have stated, in Belgrade's Chamber of Commerce we have organized meetings with representatives of companies and Embassies of other countries.

In July in 2016, at the initiative of the Agency of Environmental Protection of the China's Sechuan Province we organized a meeting in our offices. This was the first meeting on the topic of environmental protection which was organized with the Republic of China. We always use the first encounter and meeting with the delegation from a country for getting to know each other and presenting our potentials.

Interview by: Vesna Vukajlović





FORD ACHIEVES ZERO WASTE TO LANDFILL AT ITS LARGEST & MOST COMPLEX CENTER YET

Michigan based automaker, Ford, has achieved zero waste to landfill at its historic Rouge Center in Dearborn after two years of planning. Michigan based automaker, Ford, has achieved zero waste to landfill at its historic Rouge Center in Dearborn after two years of planning. The company said that the facility is its largest complex to send zero waste to landfill.

"With 16 million square feet of factory floor space and approximately 7,000 employees it was a challenge, but we've succeeded in finding solutions for our manufacturing waste streams," said Gary Johnson, Ford North America manufacturing vice president. The company explained that when one of its facilities is given landfill-free status, it means that absolutely no manufacturing waste from the facility goes to any landfill. The center is now said to be keeping more than 14 million pounds (6350 tonnes) of waste out of landfills – enough to fill the beds of more than 4,400 Ford F-150 trucks.

Sustainable Model

According to Johnson since 2004, the historical Ford Rouge Center has served as the company's model of sustainable manufacturing. "Two years ago we instituted a closed-loop recycling system, where we



recycle up to 20 million pounds (9007 tonnes) of aluminum stamping scrap each month, which is the equivalent to 30,000 F-150 bodies," he said.

"In addition, the plant has one of the largest living roofs in the world, which helps us reduce energy usage by keeping the plant warmer in the winter and cooler in the summer," continued Johnson. The company added that the six facilities at the Ford Rouge Center join 68 other Ford facilities around the world in going 'true zero waste' to landfill. However, the process of diverting waste at the Rouge was said to have been a tough one because of the number of facilities there. Ford said that its environmental engineers had to look at all of the waste streams at each plant to determine what could be done with the waste.

Ford said that one particularly difficult question was how to handle the swarf – the metal shavings and chips that are created when metal is ground during the engine manufacturing process at Dearborn Engine Plant. The team found a machine called a briquetter that could transform the metal back into a brick that can be recycled. Any coolant oil on the metal shavings is squeezed out during the process and is then reused. In another case, long plastic rivet strips needed to be chopped into small pieces so they could be recycled. Importantly, Ford said that its sustainability efforts are not only good for the environment – they make good business sense. "Our global waste strategy commits Ford to reducing waste to landfill, and we have made great progress in our facilities around the world," said Andy Hobbs, Ford Motor Company director, Environmental Quality Office. "We are proud of the efforts of our employees worldwide in their commitment to helping Ford reduce its global environmental footprint, and especially pleased with this achievement at our iconic Ford Rouge Center."

Source: waste-management-world.com



NEW INTERNATIONAL SOLID WASTE ASSOCIATION PRESIDENT INAUGURATED

At the ISWA Congress 2016 in Novi Sad, Serbia Antonis Mavropoulos was formally elected and inaugurated as the new President of the International Solid Waste Association.

A Chemical Engineer by profession, Antonis has worked tirelessly over many years as founder and CEO of D-Waste, as well as in his capacity as Chair of ISWA's Scientific and Technical Committee. He also operates a second waste consultancy, EPEM. Antonis has also completed more than 150 projects in 15 different countries and he has worked as an Associated Researcher of National

Technical University of Athens (NTUA). Travelling the world ISWA's new President is known for sharing his knowledge and vision of a Wasteless Future. When not travelling he works from his office in the beautiful and historic city of Athens, Greece. Readers of Waste Management World will already be well acquainted with Antonis through his articles exploring the future of waste management, the technologies of the future and the move towards a more circular economy, which are among the most popular articles on this website. In addition to all of that, Antonis somehow finds time to encourage innovative crowd-sourcing projects that can involve thousands of experts. "Let's map the world's most innovative start-ups related to recycling and waste management," he says. "Let's share insights on how social and technological innovation can reshape the recycling and waste management industry." Antonis replaces the outgoing President, David Newman. David dedicated four years to ISWA, promoting sustainable waste management for all and bringing the issue to the forefront at organisations such as the United Nations. He used such platforms to call for better environmental and economic justice for those in low and middle income countries. As ISWA's official publication we're sure our readers will offer Antonis a warm welcome to the role, and will thank David for all of the time, hard work and effort over the past four years.



Source: waste-management-world.com



MINISTERS REJECT CALLS FOR CHARGE ON UK'S DISPOSABLE COFFEE CUPS

Ministers have rejected calls for a charge on the 2.5bn disposable coffee cups thrown away each year because they believe coffee shop chains are already taking enough action to cut down waste.

Theresa Coffey told the Liberal Democrats, who have urged the government to impose a 5p charge similar to that levied on plastic bags, that industry and chains were already doing enough voluntarily.

"Many major chains are taking their own action to incentivise environmentally friendly behaviour, for example, offering a discount on drinks if customers bring their own cup," the environment minister wrote in a letter to Lib Dem MEP Catherine Bearder. But Starbucks is the only major chain to offer customers a discount, of 25p, if they bring in their own cup. Costa and Pret a Manger give coffee drinkers no financial incentive to reduce the waste created by takeaway cups. Caffe Nero gives customers double stamps on its reward cards for reusable cups. The minister also pointed to the establishment of an industry group to look at the problem. "This letter shows the Conservative government is in complete denial about the scandalous waste caused by throwaway coffee cups. Not only is the minister refusing to act, she is refusing to even acknowledge this as an issue," said Bearder.

It emerged earlier this year that only one in 400 coffee cups are recycled because they are made of a difficult to recycle mix of paper and plastic. That prompted calls for a charge on takeaway cups by the chef Hugh Fearnley-Whittingstall and the then-environment minister, Rory Stewart, and saw Starbucks begin a trial of recyclable cups.

Last month a Cardiff University study said the 5p bag charge had been so successful in England that a fee on cups could work too. The research found that the bag charge had led people to more willingly embrace other waste policies too, such as a charge on plastic bottles or coffee cups. "We saw with the 5p plastic bag charge how a small intervention can make a huge difference in cutting unnecessary waste and protecting the environment," said Bearder. "The Conservatives should build on this success, not leave it up to the private sector alone when that approach has so clearly failed in the past."

The Paper Cup Recovery and Recycling Group, an industry body founded in 2014, defended its record on waste. "The industry recognises it has to do something. Therefore it's done exactly that and said we recognise the concerns and let's get some sustainable solutions to recycle more cups," said the chairman, Neil Whittall.

There are two main companies in the UK that recycle the current cups, which are made up of about 5% plastic to stop them leaking. Whittall said although he could not give an exact figure for how many cups are recycled, the market for disposable cups was still growing. But the government said it has no plans to impose a mandatory charge on the cups, which experts recently said will take decades to break down.

Source: theguardian.com



THROUGH THE COOPERATION OF PRIVATE and Public Sector to Efficient Solutions

ISWA - International Solid Waste Association is a global, independent and non-profit organisation whose work is focused on the improvement of sustainable development and professional waste management. The vision of the association is the clean planet and the efficient use of waste which is recycled, collected and treated adequately. ISWA brings together experts and scientists. It also, organises annual congress which includes representatives of political organisations and businessmen. This important event was held in Novi Sad from 19th to 21st of September. The trust that was put in one country such as Serbia is a privilege, but also a sign that proactive participation of our country in preserving the planet and solving problems in this area is expected. EP has talked to Mrs Nevena Čolić Mohora, who is the general manager of the company Miteco. Mrs Mohora participated in ISWA congress, and it was an ideal opportunity to find out more about Miteco company. It is certainly one of the most exemplary companies in Serbia which is confirmed by the opening of the recycling facility in May this year. The chairman of the company Miteco, Mr Miodrag Mitović, opened the transfer station for industrial and hazardous waste, a new recycling facility and mobile facility for remediation of contaminated sites with PCB.



Nevena Čolić Mohora

EP: In what way will the new recycling complex of Miteco company contribute to the improvement of waste management system in Belgrade and Serbia?

Nevena Čolić Mohora: Recycling complex, which consists of recycling plant transfer station for hazardous waste and mobile plant for remediation of contaminated sites with PCB, apart from recycling, will enable the final disposal of hazardous components (integral approach to waste management). The necessity for this appeared in the Plan on Waste Management for the city of Belgrade, in the area of municipality Rakovica. In terms of the improvement of business environment in this country, this complex contributes to the preparation of the field for the arrival of foreign investors by allowing the remediation of historical pollution and disposal of historical waste from the locations where they plan to invest.

EP: Within ISWA Congress, Miteco held a panel "New Chapter in Hazardous Waste Management in Serbia". What are your expectations?

Nevena Čolić Mohora: Performance of ISWA congress in our country is an excellent opportunity for the broader public to become

familiar with the global trends in the field of waste management and sustainable development. The conference was an opportunity to exchange views in order to establish a system of circular economy, what are prerequisites and what are obstacles along the way. We presented our experience and we tried to put a focus on the issue of removing of historical waste, dynamics, roles and necessary resources together with international experts and organisations.

EP: Inadequate treatment of pharmaceutical and medical waste is a huge challenge for our country. How can we solve that?

Nevena Čolić Mohora: The main reasons for the unregulated state in terms of the treatment of this type of waste are vaguely defined financing system for collection, transportation and final waste disposal, as well as the nonexistence of the plant for final disposal. We believe that the incinerator is a proper technical solution for the adequate and safe treatment of pharmaceutical and medical waste.

EP: Removal of the devices which contain PCB is an obligation which Serbia has if we want to be part of the EU. What would be a realistic deadline for the implementation?

Nevena Čolić Mohora: The efficiency of removing of PCBs from the environment is based on the close cooperation between public and private sector. The role of private operators, which possess adequate infrastructure, skilled workers and certified procedures, is very important in this process. We are not talking just about the replacement and removal of devices, the final disposal of highly dangerous type of waste, but also about the rehabilitation of the land on which was established the presence of PCB. According to the Law on Waste Management, the deadline for the disposal of PCB is by the end of 2019, and GEF/UNIDO, the World bank and European delegation provide assistance to Serbia in order to do this in a safe and environmentally responsible manner. The estimation is that the projects in this field will be implemented in the following 5 to 10 years.

Interview by: Vesna Vukajlović





WE PRODUCE BIOGAS and Save up to 140,000 Euros per Year

Plant for the waste water treatment in the Carlsberg beer factory in Čelarevo opened in 2010 in the presence of the top state officials. This brewery is among the first in Serbia which presented this kind of facility. They wanted to emphasize that they care about the broader community and the environment. The total investment amounts to around 5 million euros and there is a plan for other innovations such as the use of treated water for the watering of green areas, which our interviewee has announced. There is ambition for more efficient use of resources, especially water, since in 2015 3.6 hl of water was used for the production of 1 hl of beer. There is a plan to spend 3.5 hl of water in 2016 for the production of the appreciated drink. We met Marko Mares after the presentation on which he presented Carlsberg as a responsible and active company. He gave us some more details on waste water treatment exclusively for our new bulletin.

EP: At the fair dedicated to water management in the organization of RENEXPO, which lasted from 6th to 8th June, you presented Carlsberg as a responsible and modern company that takes care about the waste water treatment and at the same time about the broader community. Tell us briefly what makes Carlsberg an exemplary when it comes to waste water?

Marko Mareš: Since the Carlsberg has CSR (Carlsberg Social Responsibility) plan on environmental protection and self-preservation of the local community on a global level, our concern and responsibility about the environmental impact is related to many fields, and not only to the treatment of waste water, but waste water is the biggest and the most significant project in Carlsberg Serbia. When it comes to the plant itself, it is a very modern automated department for tertiary treatment of waste water, which means that the incoming waste water is purified, mechanically – by removing physical impurities, microbiologically – in methane and aerobic tanks and with sedimentation - with the reaction of chemical agents that bind chemical impurities such as phosphorus. This method of purification has an outstanding result for the efficiency of the department and up to 99% in comparison to the incoming pollutants, for which we obtain confirmation from the Institute for Public Health in Novi Sad by water analysis. The results

of the analysis are in accordance with the stipulated standards for discharged water and present ecologically safe water for discharge into natural recipients.

EP: What else does Carlsberg implement in its business policies and ethics which is related to recycling and solid waste? What are your performance data in these areas?

Marko Mareš: Brewery Čelarevo holds ISO 14001 standard for Management Systems of Environmental Protection, whose part is waste management. The Brewery collects all hazardous waste, which includes waste oils, electrical and electronic waste, fluorescent tubes, hazardous waste packaging as well as waste which is non-hazardous and that is: cardboard, plastic, glass, metal, wood, by-products of primary production. The transportation of the collected waste is carried out in accordance to the Law on Waste Management by external operators who have permits for transportation, disposal and waste treatment. The company Carlsberg Serbia has annual national targets for the amount of recycled packaging which are successfully implemented together with the company Sekopak that is engaged in waste management.

EP: Does Carlsberg Serbia have some specifics in the process of treating waste water and what are they?

Marko Mareš: As mentioned before, the station for waste water treatment in Čelarevo is specific precisely because it covers all the aspects of pollution and the water is released from polluters. By doing so, in a methane reactor (microbiological treatment) we get biogas in the form of methane as a product of metabolism of microorganisms which process wastewater. Carlsberg Serbia uses this gas as a replacement fuel for natural gas which we normally use in the quantity up to 18%. This method of biogas utilization generates the savings of around 140,000 euros annually.

EP: Can you tell us something about your new plans and will you improve and modernize the existing procedure?

Marko Mareš: Current activities are related to the manufacturing processes in order to reduce the percentage of waste materials and then the preparation of waste materials for easier removal and treatment, which would reduce the load on the station for waste water treatment. This will be regulated by a combination of production processes' optimisation, as well as the inclusion of various technologies such as decanters for the treatment of tropes which would reduce the waste amount of solid matter. Regarding the further plans for the factory for the waste water treatment there is an idea to further use the treated water for watering green areas, but that project is still in the initial stage.

Interview by: Vesna Vukajlović



OUR EXPERIENCE IN SERBIA

Is Positive

General Manager of SADE Serbia Mr. Allain Francois will tell us for our bulletin something about the projects which are ongoing in Serbia. Numerous projects in the field of the improvement of water supply and sewage have been carried out under the auspices of the company SADE at the local level. By the end of the last year the journalists had a chance to see the presentation of SADE company at the Embassy of the Republic of France and within it the most significant activities of this company at the global level have been presented. Otherwise, this company with the headquarters in Paris has existed for 90 years. Areas of its activities, in addition to water management are also telecommunications, engineering and energetics. On this occasion, we get the firsthand information about the projects which are implemented in our country.



Allain Francois

EP: The contract for the rehabilitation of the plant for the production of drinking water between PUC 'Water supply and sewage' and the company SADE is implemented and the plant has been put into operation. Tell us something more about this project. What is the value of this project? In what way is the investment reflected? What are the capacities of the plant and what does this mean for the quality of life in Novi Sad?

Francois Allain: The contract signed with PUC 'Water supply and sewage' Novi Sad is implemented and entirely completed in the last three years. The investment value of the project was 9 million euros and it was financed by the European Investment Bank. It was carried out by the Yellow FIDIC and it included design and construction of new facilities, purchase and installation of the equipment, putting the plant into operation and proving the parameters. The capacity of the plant is 1500 l/s and the existing technology has been improved by adding the process of ozonation and the process of filtration on GAU filters, as well as the reservoir of clean water with the volume of 10,000 m³. The plant was put into operation without interrupting the operation of the existing factory of drinking water. All guaranteed parameters were proved, whereby Novi Sad hasn't lacked in completely safe drinking water at any moment. The new plant of great significance was built for Novi Sad, since the quality of drinking water was improved with the implemented technology. The improved factory represents efficient barrier for all big possible organic pollutions of springs in the future.

EP: Tell us more about the companies SADE and VEOLIA. What other projects do you implement in Serbia? How did you apply the practice from France to our country?

Francois Allain: VEOLIA is a synonym for all technological

solutions in the field of water resources, water quality, wastewater management and one of the leaders in environmental protection. SADE operates in the field of construction of line infrastructure, water supply, sewage, gas pipelines, telecommunication networks as well as hydroelectric facilities.

We have successfully implemented many projects of common interest – the plant for the production of drinking water and collector in Novi Sad, the water line plant for the treatment of wastewaters in Vrbas, pump station in Trstenik, main gas pipeline in Kragujevac and surroundings, remediation of soil in the industrial complexes of 'Fiat' and 'Michelin', torrential barriers in the municipalities which are at risk of floods.

Among current projects I would highlight the plant for the treatment of mire for PUC 'Beogradske elektrane', sanction of the landfill's tailing pond of Zajača mine, the construction of pipeline for raw water in district Pčinjski. VEOLIA and SADE have gained the credibility not only in France but across the world, about which testify the numerous references. Both companies are essentially dedicated to the sustainable development.

EP: Water management and wastewater management is ecologically but also financially very important. What can be achieved with your systems, could you give us concrete savings examples, the improvement of environmental





quality? Explain to us in more details with what technical capabilities do you dispose with and do you perform all the stages from the design to the implementation?

Francois Allain: VEOLIA is the company with more than 160 years of experience in the treatment of drinking, leachate and waste waters. It is difficult to briefly present all the advantages of the implementation of over 350 VEOLIA technologies and solutions of energy efficiency, conservation and improvement of the environment.

DESIGN SOLUTIONS ALLOW:

- Efficient removal of all pollutants from communal wastewaters including leachate waters from landfills
- Efficient removal of specific pollutants from the industrial wastewaters
- Reuse of the processed industrial wastewaters by preserving the limited and valuable water resources
- Treatment of industrial wastewaters to a level of ZLD (Zero Water Discharge)
- The optimal energy consumption per unit of treated water
- The construction of the plant on the minimal area by using compact and patented products such as ACTIFLO and MBBR (Anox Kaldnes) process.

VEOLIA and SAD also deal with the remediation of polluted soil. The remediation of 150,000 m³ of soil polluted with hydrocarbon has been performed in the industrial complex of the company 'Fiat' in Serbia by using the method of thermal desorption.

In accordance with the investor's demand, SADE implements the

projects on EPC principle (engineering, purchase, construction) or D&B (design and construction).

EP: What is your experience in cooperation with the state administration in Serbia, Ministries, city administrations and others?

Francois Allain: Since both companies have successfully implemented several projects whose investors have precisely been the Ministries of the Republic of Serbia, that is the city administrations and public utility companies as the end users, we can say that our experience was positive. The communication was mainly achieved through the cooperation of contractors and investors with the creditors and donors, that is through the programs of the Delegation of the European Union in the Republic of Serbia, European Investment Bank, KfW bank, UNDP and other organizations.

Both public and private investors today require a comprehensive and cost-effective, but at the same time innovative technologies. VEOLIA and SADE precisely offer solutions which are designed and tailored to meet specific needs of the client.

We are regular participants of international tenders and public calls in the Republic of Serbia. Serbia is on its way to harmonize all the procedures with those that are in force in the European Union. We are optimists when it comes to full harmonization which will consequently lead to efficient functioning of all the factors on the market.

Interview by: Vesna Vukajlović



WE HAVE INVESTED over 95 Million Euros through 'Green Loans'

In overcoming challenges and achieving new results in the field of environmental protection, ProCredit Bank has a threefold approach. The bank is developing the internal environmental management system, environmental risk management in financing projects and the promotion of green financing. Mr Ivan Smiljković, the member of the Executive Board of ProCredit Bank, has told us for our bulletin more about these postulates and business ethics. The fact that ProCredit Bank organised the campaign 'For a healthier nature in our neighbourhood' together with the recycling centre 'Božić i sinovi' was interesting to us, since the theme of this bulletin is recycling and waste management. The campaign was held on 6th October on the Day of Habitats, and the main activities were focused on the promotion of electronic waste recycling. The containers were placed in front of the central bank in Novi Belgrade during ten days. People brought and disposed electronic devices, computers, equipment and similar waste.

EP: Circular economy, recycling and waste management are becoming increasingly important issues for economy and industry. In what way does ProCredit Bank change its work in accordance with these trends and what are the standards at the corporate level? What is new in the work procedures within the bank and how do you measure the performance?

Ivan Smiljković: ProCredit Bank takes care about the environmental impact of work through the internal system of environmental management, which represents a part of the overall Environmental Management System set at the level of the entire ProCredit Group. In addition to internal measurements for the reduction of energy consumption and other resources, whereby we rigorously take care about the rationalisation of their use, the very important part of this system is the waste management. And when we talk about the bank, we primarily think about paper, electronic and electrical devices, and also on used cartridges. The aforementioned waste, which is inevitably created in banks, is surrendered to the authorised companies for storing and treating. Within the bank there are procedures which are in accordance with the legislation and which help all employees to properly store and prepare the waste for recycling. For example, in 2015 the bank recycled 10 t of electronic and electrical waste, 31 t of paper and cardboard and 290 kg of toners.

I would use this opportunity to say that ProCredit bank is currently in the process of certification according to ISO 14001:2015 standard (Environmental Management System) which provide us with additional confirmation of our commitment to the environmental protection.



Ivan Smiljković

EP: It is known that you support and finance projects from the renewable energy resources. Do you support the projects in the field of recycling and waste management in Serbia? What funds are allocated for this purpose? What project have you financed so far?

Ivan Smiljković: ProCredit bank started investing in EE and RES in 2007 and over 95 million euros have been invested through our 'green loans' so far. Within the concept of green financing, in addition to investment in RES and EE, we support the companies that deal with waste management. We believe that with supporting such companies we strongly influence the improvement of environmental protection in Serbia. In addition to the possibilities of financing the equipment, facilities and vehicles, our bank supports the clients from these fields even through financing of current assets necessary for the purchase of raw materials – waste. Regarding the system for waste water treatment, the bank also supports the companies which install this kind of equipment through the green financing. In



order to round off this process, we finance the manufacturers and retailers of such systems. We think that we encourage an entire circle in the chain of environmental protection in this way. So far, we have financed ten companies from the mentioned fields. In the following period, the financing of these type of companies will be one of our focuses.

EP: While financing clients, do you take into consideration their dedication to environmental protection, especially the disposal and recycling of waste from production processes?

Ivan Smiljković: The risk assessment from the aspect of environmental protection and social responsibility is an integral part of a comprehensive risk assessment process for lending loans to the clients in ProCredit Bank. Certain activities of our clients carry a certain risk for the environment. Being aware of this, we approach to such activities with additional dose of caution in the process of analysis and loan approval. It is very important for us that the clients are strictly complied with the legislation. In addition to that, our officials check the situation on the locations where the business will be performed, in order to be sure that the business will operate in the direction with the least possible negative effect on the environment. There is also one of the most important issues about the way of waste disposal and further treatment. In practice, there are also cases in which we do not approve the loan, despite the solid financial performances, because of inadequate relation towards the environmental protection. Our banking advisors who work in the

field of economy very often undergo trainings and seminars on this topic and they try to convey the importance of this aspect to our clients during the first conversation, especially when it comes to larger investments.

Also, as a part of our policy there are certain parts of economy that we do not finance which can directly affect the environment and also social environment.

EP: Does ProCredit Bank, in terms of social responsibility, support recycling and waste management? Can you state some campaign, event or support which the bank has implemented?

Ivan Smiljković: In addition to aforementioned types of support for waste management and wastewater treatment through green financing, it is important to mention that ProCredit Bank is constantly raising the level of awareness of both our employees and general public. Internal initiatives and campaign which we conduct at the level of the bank, help to raise the awareness of our employees about the importance of adequate waste management and recycling. One campaign which is certainly worth mentioning was the division of 100,000 organic cotton tote bags. The goal of this campaign was to reduce the usage of plastic bags, which as we all now, pollute the environment. In addition to that, there is an internal campaign within our employees 'Cork for handicap' in which we collect corks from the bottles and hand over for recycling and the funds from the collected recycling are donated for the wheelchairs for the people with disabilities.

Interview by: Vesna Vukajlović



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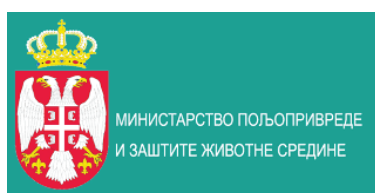
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