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Serbian Energy and Climate Policy: A Critical Perspective

Summary
Serbian thermal power plants are among the primary sources of NO_x, dust pollution and the single largest source of SO_2 in Europe. Strangely though, Europe is more worried about this than Serbia itself although Serbian citizens suffer gravely from the pollution. The UN World Health Organization (WHO) identifies Serbia as the country with the highest increase in mortality rates due to lung cancer in Europe.
Extremely high dependency on coal (lignite) for electricity production has serious negative effects on Serbia's agriculture, the health system and its economy. Even the state-owned electric power company (EPS) admits – although never officially – that the external costs of outdated thermal power plants in Serbia reach about € 13 cents per each kWh of electricity produced. This means that the real price of electricity production in Serbia is about € 18 cents per kWh. In spite of this, the new Energy Strategy envisions over 1 GW of new coal-fueled power plants by 2030. To make things worse, 76 % of Serbia's coal reserves are based in Kosovo, meaning the country will have to import coal to burn it, thus paying for additional CO_2 emissions into the atmosphere and continued external health costs suffered by its citizens. The heating sector is heavily dependent on gas imports. This dependency further compromises the energy security of Serbia.
As many would say in Serbia: "From here, the only way is up". As far as the energy sector is concerned, up means renewables. Serbia is simply not large and rich enough to preserve its coal-based energy policy, but it is slow to act on this assessment.

Ana Brnabić

Serbian Energy and Climate Policy: A Critical Perspective

I'd like to start this short analysis of Serbia's energy sector by quoting Nikola Tesla (1856-1943), our most celebrated scientist and one of the world's leading innovators: "Energy is the key problem of the future – the question of life or death. Current energy sources are not reliable and they pollute our planet. We might survive that pollution, but the day will come when these sources will run out." [1]

Serbia's commitment to coal

In the energy sector, as well as in many other ways, Serbia is almost the perfect representative of the South East Europe (SEE) region. The region as a whole relies strongly on Thermal Power Plants (TPPs), with approximately 70 % of the energy being produced from coal. The territory covered by the Energy Community Secretariat, [2] excluding Ukraine and Moldova, has 65 TPPs with the total installed capacity of close to 11 GW, which are, on average, more than 30 years old. The remaining energy production capacities, especially in the Balkan countries, come from large hydro power plants.

Of Serbia's total energy consumption, about 21 % comes from renewable energy, i.e. large hydro power plants. Although relevant Serbian authorities in charge of energy policy often state that, according to the EU's 20/20/20 targets, [3] Serbia has not only achieved but exceeded its mandatory target by now – the real figures tell a different story. In fact, the national target that Serbia has to achieve by 2020 for energy consumption from renewable energy sources is 27 %. There is nothing unfair about that: Bosnia and Herzegovina's target is as high as 40 % (!), since they are

1 See http://hr.wikiquote.org/wiki/Nikola_Tesla; the original quote reads: "Energija, to je ključni problem budućnosti – pitanje života ili smrti. Sadašnji izvori energije su nepouzdani i truju naš planet. Možda preživimo to trovanje, ali doći će dan kada će ti izvori energije presušiti."

2 http://www.energy-community.org/portal/page/portal/ENC_HOME.

3 The key objectives for 2020 are as follows: 20 % reduction in greenhouse gas emissions from the 1990 levels; raising the share of energy consumption produced from renewable resources to 20 %; 20 % improvement of energy efficiency; http://ec.europa.eu/clima/policies/package/.

currently consuming 34 % of its total energy from hydro power; Albania's target by 2020 is 38 %, because it currently has 31.2 % in large hydro; Montenegro's is 26.3 %; and Former Yugoslav Republic of Macedonia has a target of 21.9 % – all higher than Serbia.

This part of the story looks nice, clean and green. That is, until you take a look at the remaining, almost 80 % of the capacities for energy production in Serbia. That's where "black color" takes over. This remaining percentage, unfortunately, is almost entirely down to TPPs and lignite – as the fossil fuel with the most negative environmental impacts. According to data from the Annual Health Statistics Report, [4] published by the Institute for Public Health of Serbia "Dr Milan Jovanović Batut", the situation in Serbia is alarming. As a direct consequence of burning lignite, Serbian citizens suffer massively from a degraded quality of life, life expectancy and health problems. The World Health Organization (WHO), in its European Health Report 2012, [5] identifies Serbia as the country with the highest increase in mortality rates due to lung cancer in Europe. Although admittedly this is not solely due to black energy production from lignite, it cannot be argued that energy production has by far the most dominant influence. Sadly, this is easy to prove: (a) the mortality rate in the Kolubara region (coal mine) is 25 % higher than Serbia's average; (b) the average life span of the citizens of Lazarevac (coal mine), Obrenovac (TPP "Nikola Tesla") and Požarevac (TPP "Kostolac") is on average 1.84 years shorter than the average life span of other Serbian citizens. In addition, Serbian thermal power plants are among the primary sources of NO_x and dust pollution and *the single largest source of SO_2 in Europe*. [6]

These facts should certainly worry Serbia's European neighbors and it, therefore, makes sense to have the Energy Community Secretariat alert and "on our backs" with demanding renewable energy targets, energy efficiency requirements, and tough environmental standards, such as the implementation of the Large Combustions Plants Directive (2001/80/EC). [7] It is inconceivable that the EU is turning to green power only to find its accession countries polluting them nevertheless. Harmonization of environmental standards is one of the central objectives of the EU and the Energy Community which borders the EU. With harmonization come shared costs and shared rewards, with no country able to create economic advantage by emitting more toxic pollutants or more CO_2 than its neighbors. Nowhere is this process more important or more visible than in the energy sector.

4 http://www.batut.org.rs/download/publikacije/pub2012.pdf.

5 *The World Health Organization*, Regional Office for Europe, "The European health report 2012: charting the way to well-being", http://www.euro.who.int/__data/assets/pdf_file/0003/184161/The-European-Health-Report-2012,-FULL-REPORT-w-cover.pdf.

6 *European Movement in Serbia*, "Serbian EU Accession – Importance of Material Conditions in the Energy Sector", Belgrade, September 2013.

7 http://ec.europa.eu/environment/air/pollutants/stationary/lcp/legislation.htm.

On the other hand, compared to the EU and Energy Community, all of the negative impacts of Serbia's energy policy to date, and there are many, should worry Serbian citizens, the Serbian Government, and relevant Serbian Ministries much more. We are the ones directly affected, we suffer most and we pay the highest price. So how come Serbia doesn't seem worried? How come that reforms of the Serbian energy sector – to make it more efficient, more sustainable, more stable, more independent, less reliant on imports, more green, and less black – are so very difficult and slow? How come there are so many regrets because we are leaving the "good old" stateowned monopoly system and "cheap" coal-based energy production behind? Why is it that we accept the energy sector reform and the growing trend towards renewable energy sources only when it comes as a demand from the Energy Community and as a necessity of the EU accession process?

The lack of public awareness about environmental issues

My personal belief is that a lot of this is related to public education and awareness. It was a revelation to see the results of research conducted in January 2012 by Ninamedia, [8] a specialized agency for monitoring and analysis of media content in Serbia and the region. The research included the citizens of Belgrade, based on a Computer Assisted Personal Interviewing (CAPI) method, and showed that 83 % of the citizens do not see any connection between pollution and electricity production! In other words, a great majority of the citizens of Serbia fail to see the link between increase in lung cancer, respiratory problems, allergies and similar, and the production of energy from coal. In spite of this, the same research showed that 92 % of interviewees thought that Serbia should invest in renewable energy sources!

This shows that Serbian citizens overall are very pro renewables but it cannot actually be explained why. One important reason certainly is that there have been many public information and public education campaigns in the past years which have been promoting the benefits of renewable energy. Therefore, it is to be expected that the support of citizens for green energy would remain steady and even further increase (in numbers and scope) if the link between pollution and health implications and coal were better explained. Nevertheless, somehow this link remains questionable in Serbia as though it is only a theory which has not yet been fully proven. We therefore keep our eyes firmly shut concerning the negative impacts of coal and thermal power plants and consciously choose to ignore the facts hoping that this will all go away.

Clearly, environmental issues in Serbia are still taken very lightly and are treated as one of these non-significant things that we in the Balkans do not have time for and which are not really relevant for everyday life in a country which faces great economic challenges, a high level of unemployment and bleak development prospects. In Serbia,

8 http://www.sewea.rs/vesti/simpozijum/.

the environmental impact always comes second when compared to the economic impact. This is where we get to the second obvious point of Serbia's resistance to renewable energy sources: *price*.

The price of energy – key roadblock to Serbia's energy sector reform

Government upon Government, Ministry upon Ministry, Assistant Minister upon Assistant Minister, you'll always hear this mantra that renewable energy is "nice", but that Serbia is not rich enough for it. Germany, Belgium, Norway, Sweden, Denmark ... they can afford to "go green" but Serbia simply cannot. We are not rich enough.

This is THE myth of the Serbian energy sector. Hence it needs to be carefully analyzed. The electricity price in Serbia is currently € 5.4 cents per kWh for households (i.e. everyone on the low voltage) and € 5.1 cents per kWh for industry (i.e. everyone on medium voltage). The electricity price in Serbia is one of the lowest, if not the lowest, in Europe. It is obviously heavily regulated and heavily subsidized. The current price was set on 1 August 2013 and, at the time, represented an increase in price of 11.3 % on average which, as pointed out by the State electricity company EPS, did not even cover inflation increase which, from the previous price increase, was 14.1 %.

How regulated the price really is can be seen when one compares this price to the price currently being offered to large industrial consumers. As of 1 January 2013, the market was liberalized for everyone on the high voltage line, which ended EPS' monopoly in this segment. In the liberalized market, EPS offered to sign contracts with large industrial consumers at a price of about € 7 cents per kWh (approximately a 46 % increase compared to the regulated price) although, as they stated, the real market price would represent a 60 % increase compared to the regulated price of electricity. All but one company in Serbia signed the contract with EPS which goes to prove that EPS is right – the real market price is indeed higher.

Going back to the still subsidized prices, economically bizarre is the apologetic argument that EPS stated in their press release [9] when the increase in price took place in which they emphasize that "with the prices which are far below market level we will continue to support economic stability of the citizens and the State." It continues to say that "EPS has renounced considerable financial resources which it was supposed to invest in modernization, new production capacities and environmental programs, as well as into its internal reorganization."

This actually is the myth captured in two sentences: For decades now, the entire Serbian energy sector has been based on the logic that with the heavily subsidized prices, the state-owned company is "supporting economic stability of the citizens

9 *J. Putniković*, „Kilowatt gets more expensive as of 1 August", Balkan Magazin, 16 July 2013, http://www.balkanmagazin.net/struja/cid189-68933/kilovat-skuplji-od-1-avgusta.

and the State". Firstly, there is no such thing as heavily subsidized prices – citizens, as tax payers, end up paying for everything. If not through the energy bill, we pay for it through other taxes, but at the end of each year, citizens have to, and have been for years, cover the deficit on the accounts of public utility companies such as EPS. Therefore, we all share the costs, regardless of when we pay it and regardless of how much we've actually consumed. In addition to that, since the EPS has decided to abandon its profit policy, not only has this not supported the economic security of the citizens and the State, but that policy also endangers energy security as well as environmental safety. For years now, EPS has no means to invest in new production capacities, modernization or environmental protection, and private investors have no interest to invest in new capacities in the heavily regulated market. Year after year, Serbia's energy production capacities grow obsolete and with no new investment the country becomes more energy insecure, more import dependent, and with slightly less clean air to breathe.

To sum up, regulated prices of electricity and its treatment as a social category represent one of the most important causes of stagnation and degradation of Serbia's energy sector. Therefore, electricity prices are one of the greatest challenges for the sector's modernization.

In the past two to three decades, the subsidized price of electricity has caused multiple problems for the energy sector. Economically, the prices discouraged any serious investments in the energy sector, including new thermal power plants or large hydro, since they cannot be financially viable. At the same time, they prevent adequate maintenance of the system as state-owned companies – EPS primarily – suffer losses. In the long run, this leads to a significant energy insecurity and dependence on expensive imports. Politically, such prices, under the false pretense of "preserving social peace", protect the State monopoly on the energy market and thus represent an obstacle on the EU accession path with regards to market liberalization, emissions of gases with greenhouse effect into the atmosphere, and lack of utilization of renewable energy sources. Finally, the most notable consequence of heavily subsidized prices of electricity is energy inefficiency. Simply put, citizens do not have financial incentives to save energy. The lower the prices the higher the consumption. Naturally therefore, Serbia is on the very top of the European list of energy consumption per capita. According to the Consumer Association of Serbia (APOS), the average consumption of electricity in Serbia is 150-200 kWh per square meter a year in residential buildings, which is three to four times more than the European average. [10]

The real price of electricity

When talking about the subsidized prices and enormous impact they have on the energy sector in Serbia, one would necessarily have to ask what the real price of

10 http://www.apos.org.rs/cms/index.php/sr/vesti/1-latest/589-zato-energetska-efikasnost-ne-stanuje-u-srbiji.html.

electricity production in Serbia actually is. Is coal really that competitive in pricing to remain Serbia's preferred energy option?

Over the last 30 years the EU has started systematically including so called marginal, i.e. external costs in energy pricing. When deciding on a nation's energy mix, a responsible energy sector management would have to take into consideration the effects of subsidized prices and a heavily regulated market, as well as the real costs of electricity production. In Serbia, however, to date, none of the Energy Ministries ever produced an official analysis of the real price of electricity from coal, which would include external costs. This is simply irresponsible in a country as heavily dependent on it as Serbia is. Therefore, the price in traditional calculations on which Serbia's energy mix is based (which often quotes € 2.4 cents per kWh as the final cost of electricity currently produced in Serbia from TPPs) does not include serious and extremely dangerous costs resulting from burning, excavation, transport, displacement and water, air and land pollution. Fortunately enough, the Serbian NGO sector with focus on promoting the country's sustainable development produced a plethora of analysis and reports from which one can draw relevant conclusions. Some of the most comprehensive and informative studies were done by the European Movement in Serbia and the Center for Ecology and Sustainable Development (CEKOR).

Two outstanding studies [11] provide an excellent insight into the real price of production from coal in Serbia. According to these studies, the most important external costs of coal-based electricity production are the acidifications of agricultural and forest communities as they make the strongest negative impacts on the Serbian economy. CEKOR notes that we already have major damages that acidifications have done to agricultural lands (soil erosion and lower agricultural productivity), greater risk of forest fires and lower forestry growth. In their study, CEKOR cites data from an internationally recognized study completed by the Health and Environment Alliance (HAEL) which shows the losses of 2,000 human lives and € 1.8 to € 4.9 billion health costs directly caused by the consumption of coal in the Serbian energy sector. In the early 1990s, a series of "External Costs of Energy" projects (ExternE) developed the "ExternE-Methodology" as an approach of calculating environmental external costs called Impact-Pathway-Approach. According to the "ExternE-Methodology", the Serbian state-owned power company EPS creates more than € 13 cents per kWh. In other words, the real price of electricity produced from coal in Serbia is approximately € 18.5 cents per kWh.

External costs, counted by many different parameters, such as Potential Years of Life Lost (PYLL), Years of Life Lost (YOLL), additional costs to the healthcare system, losses incurred by the agricultural sector, and similar, are just one of the additional costs of

11 *European Movement in Serbia*, "Serbian EU Accession – Importance of Material Conditions in the Energy Sector", Belgrade, September 2013; and *Center for Ecology and Sustainable Development*, "Notes about Real Cost of Electricity in Serbia – Contribution to the Discussion on the Energy Strategy of the Republic of Serbia 2015-2025", Belgrade, December 2013.

the coal-dependent energy sector. The other increasingly important cost is the cost of CO_2 emissions into the atmosphere and the cost incurred due to environmental improvements of old thermal power plants, directly linked with the implementation of the Large Combustion Plants Directive. Of the total of 65 TPPs based in different countries/contracting parties of the Energy Community (without Ukraine and Moldova), about 84 % will have to install desulphurization filters, 50 % will have to install filters for dust particles, and 33 % will have to change combustion parameters to reduce nitrogen oxide. In some cases, for extremely outdated power plants, this revitalization process will simply be too expensive and they will have to be shut down completely and replaced by new ones.

In order to meet its targets in this respect, estimates are that Serbia will need to reconstruct or completely replace about 4,000 MW of currently installed capacities for electricity production and almost the entire central heating infrastructure. The Electric Power Company of Serbia (EPS) has already embarked on this process and invested considerable resources, mainly with the support of international funds. One of the most notable Serbian partners in this respect is the Government of Japan which, through the Loan Agreement between the EPS and the Japan International Cooperation Agency (JICA), invested approximately € 250 million into the flue gas desulphurization (FGD) plant at TPP "Nikola Tesla A". [12] To date, this agreement represents the largest investment in the field of environmental protection in Serbia. In order to fully implement the Large Combustion Plant Directive and align with the EU standards, EPS estimates that an additional € 1.2 billion investment will be needed into filtering systems, transportation of ash and dust, water purification systems and similar. This obviously is a large undertaking which will require very considerable resources from the republic budget and a carefully designed strategic plan.

Or, it will require EPS to become profitable. Failure to implement this in time is likely to have even greater consequences for the country's budget due to CO_2 emission reduction targets. EPS produces between 30 and 35 million tons of CO_2 annually and Serbia is slowly approaching the figure of 70 million tons, a level registered back in 1990. This is a scary prospect considering that the EU seems firmly set to largely decarbonizing its energy sector by 2050 of which the first step is to reduce greenhouse gas emissions by 40 % below 1990 levels by 2030. [13]

Although Serbia must hope that there will be a little bit of "forgive and forget" on account of on-going reforms and a suffering economy, it is likely that all such kind of requests will be ignored in the EU. Greece has just tried to play a similar game and is likely to fail. In 2011, Greek power plants emitted 92 million tons of CO_2 into the atmosphere largely due to the Public Power Corporation (PPC), the former state

12 http://www.tent.rs/sr/vesti/56-poslovna-saradnja-pd-tent-sa-inostranstvom-primena-novih-znanja-i-razmena-steenih-iskustava.

13 *European Commission* – IP/14/54, "2030 climate and energy goals for a competitive, secure and low carbon EU economy", 22 January 2014, http://europa.eu/rapid/press-release_IP-14-54_en.htm.

monopoly, responsible for 70 % of electricity production, all of which is generated mostly from lignite. [14] It now faces an estimated € 150 million bill under the EU Emissions Trading Scheme (ETS) for last year's CO_2 emissions. This should be a good indication of what awaits Serbian EPS which would, at the price of € 15 per every ton of CO_2 pumped into the atmosphere, have to pay the bill which would be, more or less, equal to their total annual turnover. All of this will significantly influence the electricity prices in Serbia as well as the country's budget in the years to come regardless of whether Serbia chooses to restructure its TPPs or build new ones.

Serbia's energy strategy – determining future energy mix

Our strategy, therefore, will have to compare the prices of new power plants using renewable sources of energy (be it wind, solar, biomass, small hydro, geothermal or any other) with the prices either from the "new generation" of thermal power plants (which are likely to range from € 7-9 cents per kWh) or for investments into the revitalization of old power plants to increase their environmental standards. This will lead to a serious competition between fossil fuels and renewables and will have to result in relevant officials rethinking and revising Serbia's energy strategy.

The time to rethink the energy strategy is now. Primarily because Serbia just went through the Parliamentary elections held on 16 March 2013 and is likely to get a strong Government which will have more than a solid majority in Parliament and will, therefore, be able to implement difficult, but needed, reforms. Also, because in January 2014, the Government of Serbia adopted the draft of the new strategy which covers the period until 2025, with predictions until 2030, and the strategy now needs to pass Parliament, once it gets established following the elections.

The strategy recognizes sustainability as one of the main challenges of the future development of the energy sector and in that regard states that focus needs to be on energy efficiency, renewable energy sources and decreasing the negative impact on environment. Maybe for the first time, the strategy acknowledges that the price needs to include environmental and other external costs through fees, taxes, penalties and other financial instruments, but that it also needs to be "socially bearable". [15] Also on the positive side, the strategy clearly identifies energy efficiency as a new source of energy. This is completely in line with the worldwide realization that one kWh saved is always cheaper than one kWh produced.

On the negative side, the strategy envisions 1,050 MW of new coal fired power plants to be installed in Serbia until 2030, of which 700 MW should be installed

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14 http://www.aljazeera.com/indepth/features/2014/03/greece-blows-smoke-at-eu-201432121223982991.html.

15 See http://www.merz.gov.rs/sites/default/files/Nacrt %20strategije %20razvoja %20energetike %20Republike %20Srbije %20za %20period %20do %202025. %20godine %20sa %20projekcijama %20do %202030. %20godine.pdf.

by 2025. Overall, the strategy predicts that by 2025 Serbia will have installed a capacity of 3,620 MW from TPPs and by 2030 almost 4,000 MW from coal only. These projections are based on the data that Serbia possesses significant reserves of fossil fuels of which 99 % are coal (95 % of those are lignite and 9 % shale) and only 1 % oil and gas. In all this, the strategy counts on the fact that these coal reserves will be able to meet Serbia's energy consumption needs by the end of the century. However, the fact is that as much as 76 % of these reserves are in Kosovo which will make Serbia dependent on the imports of coal from Kosovo or elsewhere.

This unreasonable thinking is both expensive and a bleak prediction. Expensive, because we will be burning imported coal which will bring us additional costs in externalities (health, agriculture, PYLL, YOLL, etc.), and because of which we would have to pay for CO_2 emissions. Bleak, because Serbia is already dependent on energy imports (33.5 % in 2010), heavily dependent on the imports of natural gas (84.5 % of gas consumption is currently secured through imports) and is now likely to become even more so since a large part of the strategy is based on the coal reserves in Kosovo. All this in a time when the energy consumption is on the increase: 5.7 % increase by 2020; 10.5 % by 2025; and 16.3 % by 2030. [16]

The necessary turn to renewables

Instead of coal to increase its energy safety, independence and sustainability, Serbia necessarily has to turn to its renewable energy sources. Unfortunately, the draft strategy fails to truly recognize this need and sets renewable energy targets at levels which are likely to barely meet the Energy Community targets and, thus, the country's international obligations. By 2020 – according to the draft strategy and the National Renewable Energy Action Plan (NREAP) [17] – Serbia should have installed 1,092 MW from renewable energy. By 2025, this should be increased to approximately 1,300 MW and by 2030 this should go up to about 1,700 MW. Comparing these numbers to predictions of total installed capacities in Serbia shows that about 14 % of total installed capacities will come from renewables in 2025 and about 17 % in 2030. As the EU sets increasingly higher and more ambitious targets for itself for 2030, it is likely that Serbia will have to do better than this. The country will certainly be able to do it as it has significant potentials (approximately 2,000 MW from wind only), but this does prove that renewable energy is still seen only as vehicle to satisfy one of the EU accession criteria rather than as a mechanism which Serbia is fully dedicated to in order to become cleaner, healthier and energy-wise more sustainable.

Overall, albeit some difficulties and conservative thinking, Serbia did create a plan for the installation of new green capacities in the electricity production sector and is

16 Data from the draft Energy Strategy of the Republic of Serbia, see footnote 15.

17 http://www.merz.gov.rs/sites/default/files/Pojednostavljeni %20nacionalni %20akcioni %20plan %20za %20obnovljive %20izvore %20energije_0.pdf.

slowly progressing towards reaching them. Finalization of the legislative framework is still outstanding, but it is to be expected soon after the new Government is formed. At the time of this writing, the new Energy Law is being worked on, and a bankable Power Purchasing Agreement / PPA is being discussed with international financial institutions, namely EBRD, IFC and OPIC. [18] Finalization of the legislative framework will enable the construction of more robust renewable energy projects. All of this is happening in the electricity production segment of the energy sector. Serbia then quickly needs to turn to the utilization of renewable energy in heating and then also traffic.

As previously mentioned, the country's mandatory target for energy consumption from renewable energy by 2020 is 27 %. Of that, according to the National Renewable Energy Action Plan (NREAP), 30 % should be achieved in the heating sector (from the baseline of 25.6 %); 36.6 % in the electricity sector (from the baseline of 28.7 %); and 10 % in the traffic sector (from the baseline of 0 %). By 2020, it is anticipated that the final gross consumption of energy in the heating sector alone will reach 45.5 % and the reform is badly needed in this segment as well. The sector itself is heavily reliant on gas: As an example, 85 % of the district heating system of the City of Belgrade is gas-fueled, and a little bit less than 15 % relies on fuel oil. [19] This makes the entire heating system volatile to imports of natural gas.

On 6 January 2009, the ongoing Russia-Ukraine natural gas dispute resulted in the temporary cessation of all gas deliveries to Serbia from Russia. At the time, the country was experiencing its coldest weather of the season. The combination of the two events triggered a Serbia-wide emergency situation. Beogradske Elektrane, the district heating company of Belgrade, and Udruženje Toplana Srbije, the district heating association of Serbia, announced that the district heating plants that have the ability to switch to fuel oil should do so. Naftna Industrija Srbije, the Serbian Oil Industry, promised to provide all means necessary to provide sufficient quantities of fuel oil until the country's gas supply stabilized. Srbijagas, the state gas company, urged all customers to immediately stop using natural gas in order to minimize the severity of the impact caused by a complete cut-off of the Russian gas delivery. The gas supplies of the system were only sufficient for the next couple of hours, required to safely shutdown the plants.

By the morning of 7 January 2009, Serbia remained completely cut off from the natural gas supply, as the domestic production of gas was not sufficient to keep the

18 As a curiosity, it is interesting to note that Serbia started the implementation of a renewable energy legislative framework in November 2009 when the first Decree on stimulation measures, i.e. feed-in tariffs, was adopted. To this date – almost five years later – this job has not yet been done. Simply, it are signals like these that chase foreign investors away from Serbia and the big task ahead of the new Government is to change such practices and make the legislative changes more efficient, transparent and predictable.

19 http://www.beoelektrane.rs/basic_information.html.

natural gas pipeline operating. Tens of thousands of households were left without heating during those couple of days and hundreds of thousands of Euros were lost due to suspended or reduced production caused by the natural gas crisis. [20] If anything is to be learned from this lesson, it is that Serbia's heating sector must become more self-sustainable. Precisely for this reason, the utilization of renewable energy and modernization of district heating systems will have to become imperative for the energy sector.

The light at the end of the tunnel

Serbia is yet to benefit from the green economy. In 2010 major investors in wind energy established the Serbian Wind Energy Association (SEWEA) with the goal to act as partners to the Government of Serbia in order to establish an investment-friendly renewable energy legislation. The investors gathered around SEWEA thus far invested in Serbia probably a little bit more than € 25 million solely into the development of their projects (although none has started construction yet). About 90 % of this money went straight into the Serbian economy and budget, through employment of local engineering and electrical companies which were developing the technical documentation, purchase of land, different taxes in the construction permitting process, employment of local staff, and similar. The actual construction of their projects will mean additional € 700 million in the next three to five years and could even reach € 1 billion of investments, if the Government-imposed cap of 500 MW on wind increases. A considerable amount of this money will be directly invested in the Serbian construction sector which suffered badly from the economic crisis and due to inadequate legislation on planning and construction which is currently being fixed. The impact of the wind farm development in Serbia could even be larger if Serbia succeeds in transferring some of the sector's know-how and technology in the country which is entirely possible with beneficial investment conditions. This makes renewable energy resources, and wind in particular, one of the greatest investment potentials in Serbia. Hopefully, the new Serbian Government will know how to utilize this potential to the benefit of the country's overall economy.

Besides economic, there are many other benefits of renewable energy sources for Serbia. Renewables can increase Serbia's energy independence and security. This is especially true in two sectors – wind, as 70 % of the production is realized during winter when Serbia imports the most; and heating – as about 85 % of the district heating systems in Serbia rely on natural gas, which is almost fully imported from Russia and which makes the heating sector extremely volatile to changes in gas prices and import shortages. [21] Politically, renewable energy will bring Serbia closer

20 Case Study: Gas Restrictions in Serbia, USAID-funded Preparedness Planning and Economic Security Project (PPES), 2009.

21 Having said this, it is important to note that the construction of the South Stream pipeline that partly goes through Serbia will positively reflect on the country's dependence on natural gas imports, as it will make the imports less volatile.

to the EU and vice versa – lack of renewable energy utilization will prove to be a serious obstacle in the EU accession process. Inseparable with this is the implementation of energy efficiency policies without which Serbia will never be able to meet its mandatory renewable energy targets. Environmentally, renewable energy will ultimately result in a cleaner and healthier Serbia and a less negative environmental impact on its neighbors.

Summing up this brief analysis concerning the energy sector in Serbia, there are several important conclusions. ***In the electricity sector***, Serbia is heavily dependent on coal. The new Energy Strategy to a large extent continues in that same direction with over 1 GW of new thermal power plants planned to be installed by 2030. However, 76 % of Serbia's coal reserves are in Kosovo. Realistically, those reserves are out of Serbia's reach and if we count on them, it means we count on importing them. We will therefore make electricity production in Serbia dependent on coal imports. Even "clean coal" technologies have serious negative impacts on the environment and run high external costs. The calculation is simple: We pay for coal imports (from Kosovo or elsewhere), we pay for CO_2 emissions, we cover external costs of burning coal (costs incurred to our healthcare system, costs to our agriculture, costs to our tourism industry, costs incurred to our economy because of years of life lost by our citizens or reduced production due to illnesses). ***In the heating sector***, Serbia is, even more than in the electricity sector, dependent on imports – 85 % of the district heating system is dependent on gas, and 84.5 % of gas is secured through imports. This makes the heating sector extremely volatile to any political or economic frictions between the EU and Russia, as Serbia heads towards the EU. If we do not quickly turn towards renewable energy sources, Serbia's energy security will be seriously affected.

In today's world wars are fought over energy security. This is why the EU is investing so much into renewables in order to reduce dependency on energy imports. Turkey, Ukraine, China, Russia even – all are turning to their own renewable energy sources. Serbia cannot afford to go into the opposite direction.

It's high time to demystify the myth: Serbia is not rich enough to continue using fossil fuels.