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SERBIA'S CAPACITY FOR ENERGY EFFICIENCY AND RENEWABLE ENERGY

EXECUTIVE SUMMARY

Serbia has extensive unused potential for greater energy efficiency and production from alternative sources. In particular, it could profitably develop its hydro and biofuel capacity. With relatively little adjustment to the regulatory environment, Serbia could enable private enterprise to produce enough biofuel to meet local demand and even to export, while creating up to 24,000 new jobs by 2020.

Key obstacles are in the area of regulatory and institutional capacity. The lack of an effective regulatory environment makes it hard to implement existing laws and largely blocks entrepreneurs from implementing their own projects. Serbia's energy agencies suffer from an extreme lack of qualified personnel to identify priorities and lead change in this area. They also must coordinate better with the private and civic sectors and ensure that prices give consumers incentives to save energy and use alternative sources.

Moving forward, Serbia's policy makers should provide training to increase the number of energy experts, put in place the necessary regulations, and ensure that prices send the right signals.

RECOMMENDATIONS

1. The national Parliament, as well as the Government, should work on drafting, adopting and enforcing all legal and sublegal documents which are related to the Energy Development Strategy, especially those laws, regulations, and ordinances that facilitate the production of alternative energy (subsidies for producers) and the use of renewable energy sources.
2. The US and Europe should make alternative energy and energy efficiency a key objective of their foreign direct assistance programs to Serbia in all major theme areas: including economic growth, good governance, and civil society.
3. The Ministry of Mining and Energy should speed up the process of establishing the Energy Institute, with special attention to bringing together expertise from the public, private, and civic sectors.
4. The Energy Agency should develop pricing methodologies that encourage greater efficiency and the use of alternative sources.
5. The Energy Efficiency Agency should work on two-way education with the population on conservation and alternative energy. Serbia has a broad range of small but quite active environmental and alternative energy activist groups that

should be engaged to help facilitate this information conveyer belt between citizens, experts, the government, and the state.

6. The government of Serbia should liberalize the current regulation allowing only production of B100 pure biodiesel, to permit the production and sale of diesel fuel with a blend of at least 5 percent from bio sources.
7. The government of Serbia should shorten and simplify the complex series of permits necessary for wind and solar farms, and mini-hydro plants.

SERBIA'S ALTERNATIVE ENERGY CAPACITY

Serbia's industry and residential users are extremely inefficient across the board. Serbia consumes 2.7 times as much energy per unit of output as OECD Europe. Serbia consumed 15 million tons of oil equivalent (Mtoe) of energy in 2007, with 52 percent coming from heavily-polluting domestic sources of coal, 27 percent from oil, 14 percent natural gas, and 7 percent hydro. The country imports most of the oil and gas it consumes, relying on imported energy to meet 37 percent of its needs, according to the Serbian Energy Efficiency Agency.

While its large supply of domestic coal makes Serbia relatively energy independent, the Russian-Ukrainian gas crisis of January 2009 has further spurred Serbia to reduce its dependence on imported sources of energy. In general, Serbia has a lot of potential for renewable energy sources, with biomass and hydropower leading the list. Accordingly, most private initiatives and innovative solutions in Serbia are precisely in these two areas.

Projections suggest that with minor adjustments in the regulatory system, renewable energy could easily rise to one-third of Serbia's overall primary energy consumption, which now relies on fossil fuels for 93 percent of its supply. Currently, hydropower comprises almost all of the renewable energy sources employed in Serbia. With relatively little effort, the country could obtain more than 18 percent of current fossil fuel usage from biofuels, 5 percent from wind power, and 1 percent from solar power.

Serbia is not exploiting its great potential for producing biofuels, particularly biodiesel. Every year the country produces around 12.5 million tons of biomass (60 percent from agricultural production and 40 percent from forests) and most of it is not used effectively.¹ Ultimately, this current waste material could produce 2.6 Mtoe, equivalent to about 19 percent of Serbia's fossil fuel consumption. Among the alternative energy options, biomass provides the most cost effective source and would be the quickest to implement. Serbia has the capacity to produce 200 thousand tons of biodiesel per year, which exceeds national demand and opens the possibility of exports, especially to Southeast Europe.

Unfortunately, current market and regulatory conditions do not favor production of this form of alternative energy. Victoria Oil's biodiesel factory in the town of Sid shut operations in 2008 because of its inability to turn a profit. This factory produced around 26 thousand tons of pure biodiesel (B100). According to the current legal system, Serbian producers can only manufacture pure biodiesel because there is no regulatory

¹ Ministry of Mining and Energy of the Republic of Serbia, Official website, <http://www.mem.gov.rs/> (Accessed January 2009).

framework for the production of biodiesel blends with petroleum diesel. Allowing the sale of diesel fuel with a blend of at least 5 percent from bio sources could make the production of biodiesel feasible.²

Serbia also has the capacity to produce bioethanol from various crops and cellulose waste products. However, as with the production of biodiesel blends, the lack of a regulatory framework blocks progress in this area and little is being accomplished at the moment.³

Serbia's Energy Development Strategy includes directives for biofuels, which are in line with EU Directives. According to these guidelines, by 2020, 20 percent of Serbia's electricity should come from renewable sources; while biofuels should make up 10 percent of overall fuel consumption. However, because biofuels have an impact on food prices, Serbian planners predict that biofuels will only make up 6 percent of the supply.⁴ Effective application of third generation algae-based bio solutions would leapfrog this problem of food vs. fuel.

There is some potential to use wind energy in Serbia and currently the Ministry for Science and Technology Development is producing a wind atlas of the country. In the city of Vlasna, there is a 1 MW wind generator. Likewise, the municipalities of Kovin, Pancevo, and Bela Crkva have signed contracts in this area with private companies. However, again the lack of a regulatory framework is holding up progress. The situation with solar power is similar. Serbia is currently putting together a solar atlas, but little progress is made in terms of actual production.

One innovative possibility comes from processing used motor oils into heating oil. Recent research demonstrated that the used motor oil is of reasonably high quality and is cheaply available. With an investment of 800,000 to one million Euros, it would be possible to process 20 thousand tons of oil. However, since the Law on the Environment is still not in force and the regulation on oils is in a constant state of flux, this project lacks a proper legal basis.

OBSTACLES TO MOVING FORWARD

There are several obstacles to increasing energy efficiency and the greater production of renewable energy in Serbia. The lack of a proper regulatory environment is a key roadblock to further advances. While several laws are in place, often there are no sub laws or regulations on how to implement these laws. Serbian legislation also does not create incentives to encourage the production of alternative energy. Likewise, it currently subsidizes electricity prices, thereby depriving customers of an incentive to seek efficiency or self-generation.

Beyond the regulatory sphere, a variety of institutional issues make it difficult to develop new sources of energy. Serbia suffers from underdeveloped institutions, a general lack of expertise at all levels of government, insufficient cooperation among the various federal agencies that deal with energy issues, and little coordination between the federal and local governments.

Human capital issues are particularly problematic. Most important is a lack of qualified personnel to run Serbia's energy programs. Other problems include: a dearth

² Interview with representatives of the Group for renewable and alternative energy sources, Slobodan Cvetkovic and Svetomir Zivkovic, January 19, 2009.

³ Ibid.

⁴ Ibid.

of experience with renewable energy usage and equipment development, insufficient awareness among the general public about the benefits to be derived from alternative energy, and weak buying power among Serbian consumers and within the economy as a whole.

STRATEGIC AND LEGAL FRAMEWORK

Serbia lacks an effective regulatory framework designed to increase energy efficiency and advance the use of alternative sources. While Serbia has adopted an Energy Development Strategy and a Law on Energy, it lacks the necessary sublegal documents – regulations, ordinances, rules, etc. – that make it possible to actually implement the laws. Especially sensitive are the areas with the most potential – biomass and hydropower. Like other areas of energy use, these lack the necessary implementation tools that could support prospective producers and attract possible investors.

Serbia has an extensive body of laws addressing energy issues, including the 2004 Law on Energy and the 2005 Energy Development Strategy through 2015 and energy efficiency programs adopted in 2001/02. There are also international agreements, such as the energy community with Southeast Europe and the European Union and the Kyoto protocol ratification of 2007.

The Energy Development Strategy foresees efforts to improve energy efficiency and the use of renewable sources, including the adoption of additional legislation, enacting financial and non-financial incentive measures, implementation of investment projects; establishing new expert institutions and the training of more experts; and efforts to monitor the implementation of these policies.⁵

Despite these ambitious plans, the lack of the necessary sub-laws and regulations to enable these laws prevents their full implementation. Implementing agencies lack qualified personnel to implement existing legislation, resulting in delays and poor communication among regulatory institutions and private and civic actors.

The Serbian government hopes to complete many of these regulations by June 2009, and they are expected to include financial incentives for renewable energy production and an improved regulatory framework for the production and transport of biodiesel, but these deadlines have slipped before.⁶

Likewise, the Serbian government is planning to stimulate the production of electrical power from renewable energy sources by setting higher wholesale prices for energy produced from these sources (wind, biomass, etc.). In the first half of 2009, the government plans to adopt regulations on defining “privileged producers” of electricity from renewable energy sources. These regulations will define the terms of contracts between the privileged alternative source producer and electrical grid operators that will buy the electricity and ultimately sell it to the final consumers. The lawmakers preparing this legislation believe that the higher prices for the alternative energy will stimulate foreign investors to become active in this industry in Serbia.⁷ Moving forward, the most important step for Serbia is to define the legal advantages that it can offer producers of alternative energy sources and to define what sort of financial incentives it will be able to offer to increase their ability to produce this energy.

⁵ Implementation Program of the Energy Development Strategy 2006-2015, Government of the Republic of Serbia.

⁶ Interview with representatives of the Group for renewable and alternative energy sources, Slobodan Cvetkovic and Svetomir Zivkovic, January 19, 2009.

⁷ Ibid.

INSTITUTIONAL ARRANGEMENTS

Poorly developed institutions, understaffing, a general lack of expertise in the country, and sporadic coordination among government agencies all combine to produce a second obstacle. The state certainly understands the problem, but has yet to provide the kind of institutional support that will push forward useful initiatives.

Serbia has set up an extensive institutional network to address its energy problems. *The Ministry of Mining and Energy* is the leading institution in the energy sector, and is the main contact point for all issues regarding renewable energy sources. Its job is to coordinate a host of other agencies throughout the government. While it generally receives high marks, it is not completely fulfilling the tasks of implementing the Energy Development Strategy. Unfortunately, it only has one person dedicated to renewable energy sources and energy efficiency, so it is not a logical coordinator in the field.

The Energy Agency of the Republic of Serbia (EARS) is the overall regulatory body for ensuring that Serbia's energy market is functioning smoothly.⁸ While the agency does not have a direct role in addressing alternative energy, it will be a key player in speeding up the production of legislation on renewable energy sources, a task that has taken on greater urgency after the 2009 Russian-Ukrainian gas crisis.⁹

The Energy Efficiency Agency (SEEA) is an independent state organization focused on providing counseling, expertise and education on energy efficiency and renewable energies. Founded in 2002 by the European Agency for Reconstruction (EAR) and the Ministry of Mining and Energy, it has 11 employees.¹⁰ The EAR finances demonstration projects in buildings, communal energy, industry, and renewable energy sources. Its education programs are directed to citizens, schools, and the non-governmental sector.¹¹ On the basis of EAR donations, the agency has realized two demonstration projects, as well as four feasibility studies. One project (testing wind potential) was implemented with help from the Spanish government. Additionally, the agency has an annual budget for renewable energy sources.¹² It provides advice to all investors interested in working in this area, while the Serbian Chamber of Commerce maintains a database of investors.¹³

Serbia is also preparing to establish an Energy Institute under the Ministry of Mining and Energy that will engage experts to provide a wide range of policy guidance. Everyone agrees on the need for the institute, but debates continue on its actual structure.¹⁴ This institute will cooperate with relevant EU institutions, including the European Commission's Directorate-General for Energy and Transport and the Common Research Centre. As part of its mandate, the institute will bring together all fields connected to energy, including ecology and economics, and all fields for energy

8 Energy Agency of the Republic of Serbia, Official website, <http://www.aers.rs/> (Accessed January 2009).

9 Interview with representatives of the Energy Agency of the Republic of Serbia, Aca Markovic, Aca Vuckovic and Nebojsa Despotovic, January 23, 2009.

10 Energy Efficiency Agency of the Republic of Serbia, Official website, <http://www.seea.gov.rs/> (Accessed January 2009).

11 Interview with representatives of the Energy Efficiency Agency, Bojan Kovacic and Rastislav Kragic, January 22, 2009.

12 Ibid.

13 Ibid.

14 Interview with representatives of the Energy Efficiency Agency, Bojan Kovacic and Rastislav Kragic, January 22, 2009.

applications (buildings, industry, etc.). Currently, specialists working in these areas are focused on their own concerns, thereby blocking the establishment of the Energy Institute as envisaged in the Energy Development Strategy.¹⁵ Eventually, the institute will be a specialized organization that continually monitors existing conditions and anticipates developments across the entire energy system. It will have the capacity to implement energy tasks in the new working and business conditions of Serbia's energy producers and consumers.¹⁶

Finally, the *Group for Renewable and Alternative Energy Sources* within the Ministry of Environment and Urban Planning contributes to projects and studies aimed at increasing the use of renewable and alternative energy sources (wind, hydro, biomass, biogas, solar, geothermal, waste energy, etc.).¹⁷ The group works to stimulate the production of biofuel, helps implement European legislation and is contributing to a draft of a law on renewable and alternative energy sources in Serbia. Additionally, it is working to build public administration capacities by further developing Serbia's human capital.¹⁸

DEVELOPING EXPERTISE AND HUMAN RESOURCES

A key problem for all of the state agencies is a shortage of well-qualified personnel. More staff and better trained cadres would allow state agencies to better implement energy efficiency measures, determine possibilities for the greater use of alternative energy, and prepare more appropriate legislation and regulation. Furthermore, the government should empower an agency to certify and license experts to prepare energy audits and to serve as energy managers in industry and municipalities. A network of energy managers at the local government level would make it possible to better implement existing and future energy legislation in Serbia's communities.

A recent study argues that, if put to work, Serbia's current alternative energy capacity could create 24,000 new jobs by 2020. Of these new positions, 18,000 would be in designing and producing new renewable energy, 4,000 would focus on maintaining the newly built installations, while 2,000 would concentrate on additional activities. Approximately 14,000 of the new jobs would be concentrated in Vojvodina, which is the main source for Serbia's agricultural biomass, the key component in producing biofuels.¹⁹

Training 14,000 people in Vojvodina is a daunting task. With the exception of the efforts by the Provincial Secretariat for Energy and Mineral Sources and the Vojvodina Chamber of Commerce, little progress has been made in this area over the last year and a half.²⁰ The Vojvodina region can accelerate this process by providing assets to encourage greater renewable energy usage, sending young people for education and

15 Interview with Veroslav Jankovic, Pro-energo, Novi Sad, Company for project design and implementation, engineering and consulting services in energy efficiency, January 22, 2009.

16 Energy Development Strategy of the Republic of Serbia 2015, Government of the Republic of Serbia, 2005.

17 Ministry of Environment and Urban Planning of the Republic of Serbia, Official website, <http://www.ekoplan.gov.rs/> (Accessed January 2009).

18 Interview with representatives of the Group for renewable and alternative energy sources, Slobodan Cvetkovic and Svetomir Zivkovic, January 19th, 2009.

19 Milos Tesic and Milan Martinov, Biomass and biogas feedstock potentials in Vojvodina, The Faculty of Technical Science Novi Sad, November 2008.

20 Ibid.

training abroad, offering incentives to attract international partners and by increasing activities with as many international organizations working in this area as possible.²¹

Again a central problem is the lack of qualified personnel in state administrative decision-making positions. Expertise in the area of renewable energy sources is multidisciplinary, including knowledge of technical issues, natural and social sciences, economics, management, and foreign languages. Experts in this area typically shun jobs in government because they have greater opportunities in the private sector. Government planners hope that establishing the Energy Institute will help address this problem by bringing together experts from the public, private and civic sectors into one place. The Energy Efficiency Agency and the Faculty of Technical Sciences in Novi Sad are expected to be major contributors to this work.²²

Beyond a variety of expert studies, it is important to inform the population about the practical possibilities and advantages of conservation and renewable energy and for experts to be better attuned to the real challenges and opportunities of citizens as they seek to produce and consume alternative energy. Serbia has a broad range of small but quite active environmental and alternative energy activist groups that should be engaged to help facilitate this information conveyer belt between citizens, experts, the government, and the state.

To produce change on the scale necessary, Serbia and every municipality should educate experts about renewable energy use and establish centers that disseminate knowledge and encourage greater efficiency and renewable energy use; help evaluate projects; and suggest designs and other technologies that are locally appropriate.

COORDINATING WITH THE PRIVATE SECTOR

Serbia's state agencies are trying to work in permanent contact with private business groups. For example, Serbia's energy agencies work closely with the Society of biodiesel manufacturers in Novi Sad, which produces around 10 thousand tons of biodiesel per year. They also work with Victoria Oil Company and all individuals interested in producing biofuels from cooking oil. The Permanent Conference of Towns and Municipalities sees the use of cooking oil as a source for biofuels as an idea with a great future and is developing a project in this area. It is also drafting a law on waste management that will provide incentives to process cooking oil into biofuels.²³

Additionally, the Rubin Company, one of Serbia's largest producers of alcoholic and non-alcoholic beverages, is planning to build a factory in the town of Krusevac to produce 30 tons of biofuel. Without strong state support, individual entrepreneurs would not be able to make any headway in this area.²⁴

GETTING PRICES RIGHT

A key obstacle for increasing energy efficiency and alternative sources in Serbia is prices. Currently, electricity prices are subsidized and therefore customers have an

21 Milos Tesic and Milan Martinov, Biomass and biogas feedstock potentials in Vojvodina, The Faculty of Technical Science Novi Sad, November 2008.

22 Interview with representatives of the Group for renewable and alternative energy sources, Slobodan Cvetkovic and Svetomir Zivkovic, January 19, 2009.

23 Interview with representatives of the Group for renewable and alternative energy sources, Slobodan Cvetkovic and Svetomir Zivkovic, January 19, 2009.

24 Ibid.

interest in using electricity produced from conventional sources. Additionally, the Serbian government has not set prices for alternative energy high enough to provide a strong incentive for energy producers to make a profit through alternative sources. The Ministry of Mining and Energy plays the key role here, working in consultation with other ministries and agencies.

The government is currently working on developing effective price-setting mechanisms and setting appropriate prices. State officials expect to have the process in place by mid-2009.

Pricing for small hydroelectric power stations is a case in point. The price is assigned based on the cost of fixed investments and are set to allow an investor to recoup his investment in 12 years.²⁵ Unfortunately, the procedure for obtaining all the required licenses for launching one small hydroelectric power station is extremely complicated, but the state has declared an interest in simplifying the process.²⁶ The government now recognizes that no investors will be interested in the field unless they are able to provide attractive prices for the sale of the energy they create.²⁷

25 Interview with representatives of the Energy Agency of the Republic of Serbia, Aca Markovic, Aca Vuckovic and Nebojsa Despotovic, January 23, 2009.

26 Ibid.

27 Ibid.



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