Bulgaria's big energy challenge

Opportunities and barriers to investment in renewable energy

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Bulgaria plays a vital role in European energy security. Despite having limited reserves of coal, oil and gas, the country has a well developed energy sector. It is a major exporter of electricity to Southeast Europe, generated mainly by thermal, nuclear and hydropower plants. Bulgaria is a key transit route for oil and gas pipelines, which is of crucial importance to the Balkans and Southeast Europe as a whole. Bulgaria also has the capacity to become a leading generator of power from renewable sources, especially wind. This will require significant investment and increased efforts to build public support. Currently the public is in favour of nuclear power, which is seen as the reliable, lower-cost option for households. The Bulgarian government needs to balance its desire to please the electorate with its responsibility to comply with European Union accession requirements (by retiring its old nuclear facility) and to meet EU renewable energy targets for 2020.

KEY POINTS

- Bulgaria has huge renewable energy resource potential (especially wind) but needs major investment in technology, infrastructure and capacity
- Existing nuclear power plants seem a low-cost option, due to subsidies and previous up-front investment
- Consumers are concerned about cost, while the government needs to meet EU renewable energy targets for 2020
- The government needs to improve its promotion of renewable energy investment opportunities
- The energy sector needs to address corruption and monopolisation and increase transparency and public participation in decision-making

Current power generation: thermal, nuclear and hydro-power

Bulgaria currently has about 12,668 MW of installed power generation capacity, including thermal (gas), nuclear and hydro-power, and exports electricity to Southeast Europe.[1] The government is now seeking foreign investment to expand its power sector, as several of the current sources of power are undergoing review. Bulgaria also imports over 70 per cent of the fuel required for power generation and is therefore keen to develop a power sector based more on local resources.

Strategic oil and gas transit route

Bulgaria's strategic geographic location makes it an important transit route for oil and gas pipelines from Russia to Western Europe and other Balkan states. There are two major new natural gas transit projects through Bulgaria – the South Stream pipeline and the Nabucco pipeline. The South Stream pipeline will transport Russian natural gas across the Black Sea from the Russian coast of Beregoyava to Burgas, on the Bulgarian coast, from where it will continue to the north-west to Central Europe and to the south-west to Greece and Italy. Nabucco will transport gas from the Caspian Sea region and the Middle East through Turkey, Bulgaria, Romania, Hungary and Austria to Central Europe.[2]

Map of Bulgaria

In an interview for this paper, Nedelcho Popov, the former head of Bulgaria's largest gas company Bulgargas, said that as Bulgaria is highly dependent on Russia for the supply of natural gas it is important to create a close partnership between the two countries, minimising the number of 'middle men'.[3] Popov believes this is the only way for Bulgaria to negotiate reasonable prices and remain independent of external political events and interests.

Impact of EU accession on Bulgaria's energy policy

Bulgaria became a full member of the European Union in 2007. Among the conditions for Bulgaria's accession to the EU was the closure of two of the five blocks of the only nuclear power plant currently in operation, Kozloduy, with the intention of closing the whole plant in the next few years, as it is outdated. Bulgaria's EU accession agreement states that in a situation of a national crisis the country has the right to resume power generation at Kozloduy 3 and 4 (the two reactors could be brought back into operation in six months). The European Commission has granted Bulgaria a compensation package of €850 million for the closure of the plant including €300 million to decommission, clean up and treat its nuclear waste.

Controversy surrounds the ongoing construction of the Belene nuclear power plant that is meant to replace the ageing Kozloduy. This includes arguments that the environmental impact assessment for the plant is inadequate, and questions about the ability of the plant to deliver a return on its investment.

To meet EU requirements for renewable energy generation, Bulgaria must ensure that 16 per cent of its gross energy consumption is generated from wind, solar and other renewable sources by 2020. According to Bulgaria's National Renewable Energy Plan (NREAP, 2010),[4] in 2010 the overall share of renewable energy sources used in heating, cooling, electricity and transport stood at 10 per cent of total energy usage in the country, up from 9.2 per cent in 2005, which is used as a base year.

Table 1. Bulgaria in numbers

	Statistic	Source
Population (2011)	7.3 million	Bulgarian National Statistics Institute 2011
Land area (2011)	111,000 km^2	Bulgarian National Statistics Institute 2011
GDP (2010)	100.7 billion $US	International Monetary Fund, World Economic Outlook October 2010
Electricity Generation (2006)	43.1 billion kW	The European Commission, January 2007
Electricity Consumption (2008)	32.3 billion kW	World Bank, World Development Indicators, July 2011
Electricity Export (2006)	8.8 billion kW	Bulgarian National Electric Company, NEK, 2007
Electricity Import (2006)	1.1 billion kW	Bulgarian National Electric Company, NEK, 2007
Human Development Index ranking (2010)	Ranked 58th, lowest ranking for a European Union country	Human Development Index, 2010

Box 1. The European Union 2020 strategy[5]

In January 2008, the European Commission published its climate and energy package, known as the EU 2020 strategy. The strategy focuses on emissions cuts, renewable energy promotion and energy efficiency. It includes proposals for reducing the EU's greenhouse gas emissions by 20 per cent and increasing the proportion of final energy consumption from renewable sources to 20 per cent. Both targets are to be achieved by 2020. To meet the target each member state has been given a national target, based on its current renewable energy portfolio, its GDP and a flat-rate increase across all member states.

Bulgaria's renewable energy potential

Despite a limited legal and economic framework for developing a renewable energy sector,[6] Bulgaria has considerable renewable energy potential, as demonstrated by numerous research findings over the past 30 years.[7] For example, the European Bank for Reconstruction and Development (EBRD) has identified Bulgaria as a leading country for wind power, with a mid-term potential of up to 3,400 MW.[8] According to European Union statistics, a total of 120 MW of wind power capacity was installed in Bulgaria between 2007 and 2009, bringing the total to 177 MW. This increased to 336 MW in 2010 and is expected to reach 1,250 MW by 2020.[9]

Bulgaria also has substantial potential for generating power from biomass.[10] About 90 per cent of Bulgaria's land is arable, agricultural or forested land. Bulgaria also has large reserves of geothermal waters used for heating, greenhouses, drinking water and bathing. There is an estimated potential for up to 200 MW of geothermal power generation, subject to verification.[11] The country already has considerable hydropower potential and this sector could be expanded.

The government and green energy

In February 2008, the Bulgarian government set up a 100 per cent state-owned energy holding company, Bulgarian Energy Holding EAD, in order to improve the corporate management and supervision of the energy sector. To promote diversification of their energy sources, the Bulgarian Energy Efficiency and Renewable Energy Credit Line has been set up by the EBRD, with renewable energy projects being eligible for a 20 per cent grant. Loans of over 12.8 billion euros have already been granted.

Efficient use of water resources is a key objective of the National Energy Strategy to 2020, with a focus on privatisation and rehabilitation of existing hydropower plants and construction of new ones, mainly on the River Danube. The government anticipates particular interest on the part of investors in small-scale and micro- hydropower projects.[12]

The government is currently financing various renewable energy projects in an effort to meet the EU renewable energy requirements for 2020, while several other projects with foreign investment are under construction or in operation.

Table 2. Renewable energy investment projects

Project Title	Technology	Capacity MW	Status	Sponsor
Bourgas PV PP	Solar PV	1.25	under construction	Lukoil Ecoenergo
P2 SW Bulgaria PV	Solar PV	7.3	under construction	P2 Solar
Breznik Gehrlicher PV	Solar PV	1.2	operating	Gehrlicher Solar AG
Biomet Sevlievo Solyndra PV	Solar PV	1	under construction	Interservice Uzunovi plc
Kazanlak Wind Farm	Wind	72.5	expansion	Alpiq
Zlataritsa PV PP	Solar PV	100	under construction	SDN Company Ltd
Ihtiman 2MW PV Farm	Solar PV	2	operating	Sunservice Ltd.

(adapted from: http://www.ebrdrenewables.com/sites/renew/countries/Bulgaria/default.aspx)

Nonetheless, in May 2011 the government shortened the guaranteed time period during which the state would be obliged to purchase power generated by wind farm projects. This makes the market less attractive for investors as it reduces the guaranteed profit of their investments. The funds which were supposed to be invested in wind energy in these four years are likely be allocated to the Belene nuclear power plant which is currently under construction. Many believe that this is a political decision, to ensure more votes in the upcoming elections.

Public opinion favours cheap energy

Investing in cheaper energy is expected to result in stronger support for the government from the voting public. Despite the many favourable conditions for production of green energy, the current low cost of heat and electricity in the country has a strong impact on public opinion. The general public remains in favour of nuclear power, which at the moment is considerably cheaper due to the relatively low cost of production from the existing Kozloduy nuclear power plant. Nuclear power is up to ten times cheaper for the end consumer than wind power.[13]

Bulgaria is ranked 58th in the Human Development Index (the lowest ranking for an EU country)[14] and Bulgarian citizens are therefore concerned about the cost of power. The fact that many people in the country are still struggling to meet some of their basic needs makes the promotion of renewable energy a delicate and complex matter. Bulgarian civil society organisations have relatively little impact on awareness-raising about renewable energy potential and the risks of nuclear power.

Industry perspectives: pros and cons of investment

Bulgaria has strong potential for developing a sustainable (green) energy industry, which explains the large number of projects that have been started recently. According to Krasimir Ivanov, the economic analyst at the journal Banker, the big thing at the moment is the transformation of biomass and waste water from industrial activities into power. This is a completely new direction for the Bulgarian green energy industry, as new guarantees on state procurement of power from biomass and waste have just become law.[15] The Minister of Environment and Water, Nona Karadjova, is convinced that wind and solar energy have much lower economic value than energy from waste, which is also highly beneficial from the perspective of pollution.[16]

Despite the numerous ambitious projects now being initiated in that area, there are still many obstacles to overcome. Bulgaria relies heavily on foreign investment for the development of the energy sector (both 'green' and 'brown'). According to the Centre for the Study of Democracy,[17] implementation of large-scale energy infrastructure projects is frequently hampered by:

- the lack of a sound energy strategy with clear priorities
- apparent conflicts of interest at the highest political level, arousing suspicion of corruption
- poor management of state enterprises
- numerous monopolistic abuses at consumers' expense and the absence of adequate independent oversight
- politically motivated privatisation of assets and lack of regulation of capital entering the energy sector.

Furthermore, governance of the country's energy sector is characterised by geographical concentration on the one hand,[18] and fragmented management of state-owned assets on the other. All this means that in order to comply with the EU standards for 2020 the government needs to create a transparent business environment in which international institutions and companies can do business.

There are many examples of what can be achieved if appropriate measures are taken. One of these is the Vetrocom Kazanlak wind farm (see Box 2 below).

Box 2. Vetrocom Kazanlak wind farm

In 2009, a leading Swiss Energy company, Alpiq, invested approximately 85 million euros in the Vetrocom wind park (near the Bulgarian city of Kazanlak) with an ambitious business plan based on a seven-year return of capital.[19] The head of business development for the project, Ms Sevdalina Yontcheva, is convinced that the best way to achieve success in this market is by combining international investment practices and experience with local knowledge and management.[20]

The guarantee of a period of state purchase of the power produced combined with the relatively high prices due to the limited number of producers, makes the market attractive for many investors.

The managers of Vetrocom Kazanlak have ambitious plans for the park in terms of long-term profit. The company has recently hired 20 experienced Bulgarian engineers who will receive training in wind technology. Ms Yontcheva believes that her team will become leaders in consultancy and business development in the wind energy sector for both local companies and international investors.

The biggest challenge for starting up similar projects are the legal aspects, such as identifying and purchasing land with strong wind energy potential, construction schemes and contractual arrangements. It can take up to two years to gather all the required documents, which is an obstacle for some investors.

Nevertheless, the considerable potential for the production of green power, combined with the relatively young market offering competitive prices, makes the country an attractive destination for international investments which are expected to increase significantly in the future. Compliance with EU standards as well as stricter measures against corruption are among the factors which are expected to make the business environment more welcoming for international partners and thus to promote Bulgaria in the global market.

Conclusion and recommendations

Bulgaria has excellent conditions for the development of renewable energy (especially wind energy). However, this development has been hampered by several key factors. Corruption and monopolisation are still widespread at all levels of the industry. To the public, nuclear power generation appears to be a low-cost option, mainly because it has been subsidised in the past and major up-front investment has already taken place. Currently, it is cheaper than wind energy which requires large up-front investment for technology, infrastructure and staff training. Nuclear energy is a vote-winner due to its low prices, while civil society activism to promote greener alternatives is limited.

The government needs to balance its desire to please the electorate with its responsibility to meet EU accession requirements (retiring its old nuclear facility) and meeting EU renewable energy targets for 2020.

Based on these conclusions, the following four recommendations have emerged:

1. Stronger anti-corruption measures need to be put in place. Monthly reports should be published revealing results, plans, strategies and flaws in the system. Illegal actions should be prosecuted as appropriate.
2. Transparency and public participation should be promoted. Policymakers should start considering public participation as an important element of the decision-making process, while promoting awareness-raising and more public debate on energy issues. There is a strong need to empower NGOs, universities and civil society organisations in order to redress the balance at the institutional level.
3. Technological and technical capacities must be built. University courses and training programmes on renewable energy technology, good practice standards and business development skills should be established to build the capacities of future professionals. This is the best way to properly develop understanding of international environmental practices and adequately adapt them to local conditions.
4. Investment opportunities must be promoted. To attract international investors, the government needs a better strategy on marketing the country's renewable energy potential. One way to do this is by holding business-to-business workshops for investors. Another is by issuing better quality publicity materials and by creating and maintaining valuable business contacts. The national investment promotion agency needs to have a strong international presence as a starting point for future partnerships.

Endnotes

1. Bulgaria was the main energy supplier for the 2004 Olympic Games in Greece (World Nuclear association, 2010).

2. Asset Capital Partners (2008) South *Stream and Nabucco: Are they competitors?*'; Erol User (2011) *Turkey and Bulgaria: Europe's Energy Corridor for 2011 and Beyond*. Available at http://www.eroluser.com/img/speeches/vef_%20final.pdf.

3. Interview with Nedelcho Popov (Former CFO of Bulgargas), Sofia, Bulgaria, 24 May 2011.

4. National Renewable Energy Plan 2010 (NREAP 2010), Bulgaria.

5. Sources: http://www.publications.parliament.uk/pa/ld200708/ldselect/ldeucom/175/175.pdf; http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0002:FIN:EN:PDF; see also table of EU 2020 targets at: http://ec.europa.eu/europe2020/pdf/targets_en.pdf.

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8. European Bank for Reconstruction and Development (2010) *Country profile: Bulgaria*. Available at http://ebrdrenewables.com/sites/renew/countries/Bulgaria/default.aspx

9. The European Wind Energy Association (2010) *Wind in Power* (2009 European Statistics. Available at: http://www.ewea.org/fileadmin/ewea_documents/documents/statistics/general_stats_2009.pdf;

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14. UN Human Development Index, 2010, full document available at: http://hdr.undp.org/en/media/HDR_2010_EN_Table1_reprint.pdf.

15. Interview with Krasimir Ivanov (economist, 'Banker' journal), 24 May 2011, Sofia, Bulgaria.

16. Interview with Nona Karadjova (Minister of Environment and Water)15 May 2011, Sofia, Bulgaria.

17. Stefanov, R., *et al*. (2011) *Energy and good governance in Bulgaria: Trends and Policy options*. Center for the study of Democracy, Sofia. Bulgaria.

18. In Bulgaria, all the hydroelectric power plants (seven at the moment) are located in the north-west part of the country.

19. Bulgarian Investment Agency (2010) *Legal Guide, Starting Business and Investment*.

20. Interview with Sevdalina Yontcheva (Business Development, Kazanluk Wind Park) 20 May 2011, Kazanluk, Bulgaria.

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