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DEMOCRACY

BETTER GOVERNANCE FOR SUSTAINABLE ENERGY SECTOR OF BULGARIA: DIVERSIFICATION AND SECURITY

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Bulgaria's energy policy at crossroads

Energy is the lifeblood of any economy: oil, gas and electricity are critical to a functioning and growing nation. For all nations, economic and social well-being depends on safe, affordable and dependable supplies of energy. It becomes very clear, then, that the question of energy security is not just a question of economic security, but of national security as well.

The Bulgarian energy sector is key for the future development of the country's economy. For the past decade energy exports and imports formed on average 12% (16% in 2008) and 21% (22% in 2008) of the value of the country's outgoing and incoming trade flows respectively¹. Every fourth public procurement contract is concluded in the energy sector, making it one of the biggest taxpayers' money spenders in the country. In 2008, in a single year, the Bulgarian government committed to energy projects, requiring budgetary investments equal in value to the whole EU funds support for the

MAIN POINTS

- Bulgaria is facing a complex set of political and economic pressures necessitating an urgent change in current decision making process
- To ensure energy security the government needs to maintain a diversity of fuels from multiple sources
- Some key challenges remain:
 - Lack of transparency and prevalence of corruption in the energy sector; unlevelled playing field for market participants
 - Strong local and foreign lobbies opposing diversification
 - Lack of accountability mechanisms
 - Lack of systemic data collection
- Key recommended actions:
 - Revise and adopt the 2020 national energy strategy
 - Take diversification actions
 - Improve transparency and open market to other interested investors
 - Establish data-driven decision making process
 - Take active position on EU initiatives

¹ According to Bulgarian National Bank data on final use of exports and imports

country for the current European seven-year budget period 2007 – 2013.

There are also a number of external factors that put pressure on Bulgarian policy makers to pay special attention to the energy sector: **global climate change** and the related European Union (EU) binding targets on capping greenhouse gas emissions, decreasing energy intensity and increasing the share of renewable energy sources (RES); **economic pressures** highlighted by the current economic crisis; **political pressures** caused by foreign geopolitical and economic interests. The next section elaborates further on these external factors and the challenges they impose on the Bulgarian government in reforming the energy sector.

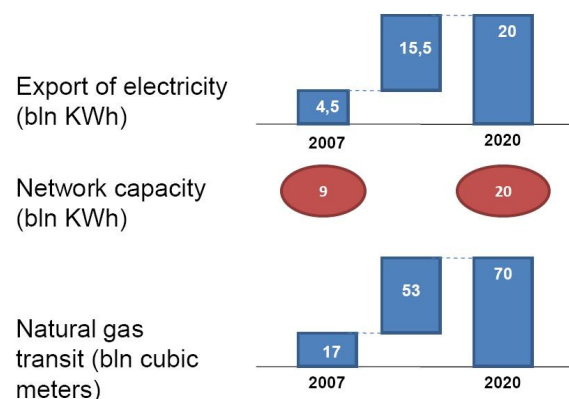
The Bulgarian government is operating in a difficult political and socio-economic context and is therefore in an urgent need to change the traditional way of making decisions in order to avoid the mistakes of the past. At the same time, current policy makers are facing a unique window of opportunity to act decisively on problems that are of utmost importance to the well-being of the country such as corruption, organized crime and reforms in the energy sector. The **ongoing evaluation of the large-scale projects in the gas and oil transit** spheres and nuclear energy production to which the previous government has committed is a good indication that the first steps are being taken towards implementing strategic decisions to creating **transparent, diversified and market-economy based energy sector** in Bulgaria. This is a challenging and complex task and a number of factors should be taken into account while the government reviews the decision making process for energy projects:

- 1) Important decisions with long-term national economic and security implications have been taken without a

strategic review of the Bulgarian energy position and available policy options. The Bulgarian government has not updated its energy strategy since 2002. Before deciding on the future of the major infrastructure projects in the country, the Bulgarian government should first **perform an independent and objective review of the 2020 Draft National Energy Strategy** and consecutively adopt the document. The draft was prepared in the second half of 2008 but was never adopted by the government or the parliament;

The international energy landscape has changed dramatically since 2002, which calls for a new policy approach in setting strategic national energy goals. Bulgarian politicians and energy lobbyists have been pushing on the public agenda the goal of establishing the country as an 'Energy Center on the Balkans' for years, implying that the way to attain this goal is through more supply of energy.

Figure 1. Goals set by the Draft 2020 Energy Strategy



Source: Bulgarian Energy Strategy 2020, CSD

If assumed that the Bulgarian economy is indeed four times more energy intensive than the average in EU-27 and that there is no fraud and corruption involved, this

would mean that just by improving energy efficiency, the country could double its GDP without creating additional demand for energy, i.e. new energy units will remain idle at best or will feed inefficiency, fraud and corruption.

Indeed, the trend in international markets and in the EU has been for primary energy dependent countries to seek **diversification and security of supply** through diversifying their energy mixes, improving energy saving and energy efficiency, introducing new 'green' technologies, upgrading national distribution grids and interconnecting supplies;

- 2) The energy sector remains one of the **least transparent and of highest corruption risk** sectors in Bulgaria. There is compelling public evidence that overcapacity in the state energy sector has led to systematic abuse and corruption, e.g. the Sofia Central Heating case, the unregulated export of electricity from Maritsa Iztok power plant, the racketeering of foreign investors, etc. The government should seek to create mechanisms for **increasing of transparency and control in the sector** in order to minimize the risk of capture of public funds by interested private circles.
- 3) Two recent crises made clear that Bulgaria is not yet prepared to manage complex projects transparently and efficiently and that increase of **diversification and accountability** should be the key focus of energy sector reforms:

In 2008 the European Commission froze **€0,5 billion** worth of EU funds earmarked for the country because of irregularities and weak management capacity. The

worst managed projects singled out by the European Commission were in the areas of water and transport infrastructure development.

In January 2009 following a dispute with Ukraine, **Russia cut off gas supplies** to Europe for almost a month, with Bulgaria and Slovakia being the worst hit EU member states. This energy crisis revealed that: (a) the Bulgarian government has no risk management or foresight mechanisms in place; a similar crisis two years before should have signaled the need for preparatory action; (b) the Bulgarian Minister of Economy and Energy and the Executive Director of the Bulgarian state-owned gas monopoly did not have real time data on national reserves of natural gas; in fact they had different data; (c) the Bulgarian industry was not well prepared to switch to alternative energy sources.

- 4) Currently there seems to be **no systematic, centralized and independent data collection**. In order to have a true **data-driven decision making** process and increase public transparency and accountability, there needs to be a comprehensive, publicly available database on energy that is constantly updated. This will allow the government to perform necessary cost-benefit and economic analysis and construct up to date models of the energy market and respective projections for its development.

Bulgarian energy sector has historically been and will remain of strategic importance for the country's economic development and national security, especially in the context of growing EU and Balkan markets. However, recent shifts in the world's economy, policy, regional dynamics, and geo-political situation are the driving factors necessitating the need to introduce

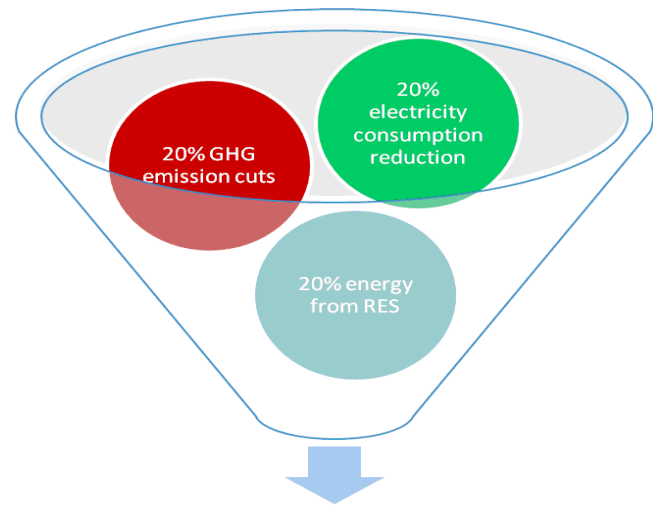
major reforms focused on a transparent, diversified, efficient, and market based energy sector in Bulgaria. Bulgaria needs to actively participate in the European and international energy debate and to address the whole complex of energy related policies.

Realities and challenges for the government

I. Climate change

The last few years have marked a historic shift in political commitment around the globe towards the use of RES, not least due to the increasing evidence and understanding of the high environmental, economic and social costs imposed by the current fossil-fuel centered energy models. The European Union and Japan, and more recently the United States (US) and China have shown determination to push forward with the “greening” of their economies in the hope of slowing down and reversing global warming and of ensuring higher energy security. As a result the EU has imposed binding targets and respective plans for action on its member states for reducing **CO₂ emissions**, decreasing **energy intensity** and increasing the **share of Renewable Energy Sources (RES)** in energy consumption.

Figure 2. EU sustainability targets 20-20-20



EU Sustainable Energy 2020

Bulgaria ranks consistently as the least energy efficient country in the EU, with still low share of RES and high energy dependence. Achieving the EU 20-20-20 targets will come at a considerable cost, including the need for many legislative and administrative reforms. A large share of the impact will be borne by households and industrial consumers. At the same time the RES installed capacities in Bulgaria have significantly increased in recent years from 3.45 MW in 2004, to a total of 269 MW in 2009. If this trend continues steadily Bulgaria will be able to fulfill its commitments by 2020 (16% of gross electricity production and 5.6% of biofuels).

Bulgarian policy makers will not only have to compensate for the social and economic costs involved in transitioning from the standard energy model, based on **consolidated fossil-fuel energy production** to a **balanced energy mix based on RES and energy efficiency** but they will also face a large set of challenges on the way:

- 1) Opponents of RES such as **nuclear and coal lobbies** will continue to oppose energy

diversification and inclusion of more RES by using **cost of electricity** as their main supporting argument. However, careful analysis will reveal that current pricing models **lack essential transparency**.

Important specific area for consideration is the **inclusion in the calculations of the energy costs the price of shipping and long-term spent nuclear fuel storage**. Currently there is complete lack of transparency and conflicting information coming from experts in terms of: actual costs of transportation and long-term storage; progress in constructing permanent storage facilities; conditions under the existing contracts with the involved Russian actors and whether there have been transfers from the budget to cover related transportation and/or storage expenses

Similarly, so far the **cost of greenhouse gas emissions of coal plants** has not been calculated in the electricity produced by coal-based plants.

Thus the true **net present value of the costs of energy production** remain unclear while part of these costs is transferred to future generations;

- 2) Lack of strategy and conditions for creating **‘energy independent’ communities** relying on local RES;
- 3) Lack of **modern electricity network** (‘smart grid’) that could facilitate RES capacities’ full utilization via the use of digital technology to save energy, control peak demand, reduce costs and increase reliability and transparency;
- 4) Lack of comprehensive **financial modeling** in investment projects which does not secure lowest cost and the utilization of the latest and most efficient technologies;
- 5) Lack of **risk assessment and mitigation plans**, which outline the biggest vulnerabilities and most probable emergency scenarios.

Table 1. Key indicators by source

Energy resource	Cost 2005 (EURO/MWh)	Cost 2030 (EUR/MWh, CO2= 20-30 EUR/ton)	Emissions (kg CO2/MWh)	Import dependence EU – 27		Efficiency	Price sensitivity	Reserves/ annual generation
				2005/	2030			
NATURAL GAS	35 – 70	40 – 85	400 – 440	57%	84%	40 – 50%	Very high	64yrs
OIL	70 – 80	80 – 95	550	82%	93%	30%	Very high	42yrs.
COAL	30 – 50	45 – 70	750 – 800	39%	59%	40 – 48%	Medium	155yrs.
NUCLEAR FUEL	40 – 45	40 – 45	15	100% uranium ore		33%	Low	85yrs.
BIOMASS	25 – 85	25 – 75	30	0%	0%	30 – 60%	Medium	RES
WIND	35 – 175	28 – 170	10 – 30	0%	0%	95 – 98%	None	
HYDRO	25 – 95	25 – 90	5 – 20	0%	0%	95 – 98%	None	
SOLAR	140 – 430	55 – 260	100	0%	0%	-	None	

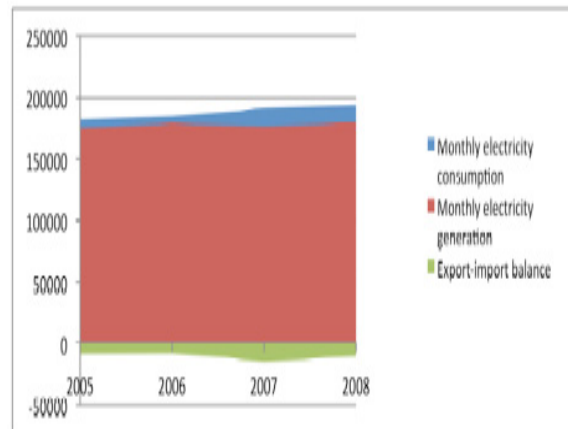
Source – International Energy Agency

II. Economic pressures

The ongoing financial crisis came as a wake-up call to the Bulgarian government and the energy sector, revealing large gaps and imbalances in the consumption patterns, inefficiency of energy production and transmission, bad financial management of state-owned companies and many irregularities in public procurement and public subsidies.² The increased pressures for efficient and transparent management and budget cuts, for leaning of the structures and processes as well as for corrective measures in price formation and bill collectability lead to the need to reconsider the viability of big energy investment projects and the structure and operations of the state energy companies such as the Bulgarian Energy Holding (BEH) and its member companies.

There is a strong need to reconsider current assumptions for market developments and energy consumption and correspondingly design **more than one scenario for sustainable development**. E.g. the Balkan electricity export market has started to shrink even before the effects of the global economic crisis in 2008.

Figure 3. Monthly electricity production, consumption and net exports: all Balkan countries except Bulgaria and Albania (GWh)



Source: Balkan Energy News, CSD

The **revised market model**, together with careful financial and cost-benefit analysis of the planned major state energy projects, should lead to an optimized long-term strategy. So far the modus operandi in the energy sector seems to have been one of yielding to external pressures and interests which force policy makers to be reactive rather than proactive, hastily meeting binding standards and criteria and yet not achieving the needed transparency and inclusive decision making.

III. Lack of transparency

The energy sector remains one of the least transparent and most corrupt sectors in Bulgaria which puts an overwhelming pressure on the efforts to further its reforms and curb the capture and inefficient use of public funds. The steep increase in investments of state owned companies, large share of which go through public procurement contracts (25% of all government public procurement contracts in 2008), leads to **increased risk of abuse of public resources**.

One of the biggest strategic decisions in that respect is **the future of the nuclear power**

² *Crime without Punishment: Countering Corruption and Organized Crime in Bulgaria* (2009), Center for the Study of Democracy

plant Belene. The case of Belene NPP is a cluster of intransparent policy and economic decisions and practices and calls for a change in the government decision-making approach. Some of the main shortfalls or bad governance practices are as follows:

- Lack of transparency of the expenses and financial management of the project;
- Escalating projections for its construction costs;
- Questionable services provided by intermediaries and consultants;
- Bad public procurement practices which question the integrity of the energy sector in Bulgaria;
- Outdated market and demand assumptions;
- Lack of transparency in long term contracts with Russian suppliers of technology;
- No details on fuel supply as well as on the transportation and storage of spent fuel.

Some of the *key steps* in addressing these issues and ultimately making the most beneficial decision on the project in terms of energy sustainability and security should include:

- **Avoiding a premature decision based on a false perception of urgency.** There are no market reasons for a hasty decision on the project's future;
- **Conducting an independent, public cost-benefit analysis** of the economic, environmental, technological and financial implications of the project;
- **Not allowing sunk costs to affect rational decision-making.** Badly run enterprises tend to deliver more losses

and negative externalities than inactive ones;

- **Revising market projections and considering planned RES capacities** when assessing the need for a second nuclear power plant;
- Actively **evaluating the available nuclear power plant Kozloduy** and its infrastructure for the possible **deployment of new Generation III reactors**;
- Considering other **alternative plans for national energy production capacity increase.**

IV. Strategic dilemmas

Bulgaria's energy strategy needs to strike a balance between alternative external dependencies. The tension between high energy **dependence on Russia for resource supply** (2006: gas – 87.1%; crude oil – 99.6%; nuclear fuel – 100% on resource and continuous dependence on spent fuel management) and the **political alignment with the EU common policies and position on energy disputes** needs to be resolved as it entails a potential vulnerability of Bulgaria on the international energy market.

1) The nuclear sector

A telling example of this dichotomy is the **closing of units 1-4 of the existing NPP Kozloduy** on pressure from the European Union. As a heavily regulated industry nuclear energy is **highly dependent on technological and safety standards**. The risk of changes in such standards leading to a premature decommissioning of a technology or an expensive upgrade is particularly high for countries, which do not participate in the regulatory process. Such is the case of the deployment of Russian technology in an EU country - e.g. Bulgaria was required to close

down units 1-4 of Kozloduy NPP although it invested heavily in the modernization of the safety in two of them. If the government settles for the **deployment of older type of nuclear technology for Belene**, then it should insist on specific clauses in its contracts with the producers stipulating compensation payments in case of early decommissioning or necessary upgrade of the technology. Alternatively it should seek to employ the latest available technology standard certified according to EU regulations.

An even more fundamental dilemma facing the government is whether there is a **justified need of a second nuclear power plant in itself**. If a correct and suitable financing scheme is built, what would be the return on investment for the country? Would the economic benefit counter balance the inevitable socio-economic and environmental liabilities that the project will bring? A deployment of new reactors **will not create diversification**; instead it will only support and further complicate the dependence on one supplier when other vendors have no entrance to the market. Belene's construction will **add a second site for nuclear waste management** with its related costs and environmental externalities. Furthermore, the Belene project has already shown to be **creating opportunities for bad governance and corrupt public procurement practices** – the recently discovered metal scrap from the construction site scheme and the renegotiation of BNP Paribas loan, just to name a few.

2) Access to market

Western investors and energy players have not succeeded in **participating efficiently and fully exploring the Bulgarian energy market**. This trend will continue as long as strategic interests and solid positions (gas delivery long

term contracts, for instance) of Russian energy giants persist. Vested interests of political and economic circles inside the country (often linked to foreign lobbies) revolving around major energy projects, leave little room for market transparency and openness. Thus, diversification of energy services (construction of plants, etc.) cannot be achieved without facilitating market liberalization and ousting of energy monopolies in the country. An enforced **liberalization** by EU regulation is a viable option for the breaking of such bad practices.

Other big foreign companies would logically behave in a similar fashion as current energy monopolies if given better opportunity – acting in pursuit of greatest economic profit, but not in the sake of the average consumer. Nonetheless, the **diversification**, genuine opening to western investors, **transparency** of the energy market and public procurement procedure will contribute positively to the competitiveness and sustainability of the Bulgarian economy and energy sector.

3) The gas sector

Important decisions to be made in the gas sector are those concerning the **transit of gas** through the country and the **national gas reserves**. The Bulgarian government should mandate an **independent feasibility study**, preferably contracted through an international tender, to review Bulgaria's participation in *South Stream* and *Nabucco*. The government should make sure that national interests are protected and decisions are made after a careful weighing of **alternative transit routes**. In addition, the government should carefully consider available options for increase of **gas storage facilities** in the country.

The Bulgarian policy makers should bear full public responsibility for tackling all social aspects of energy policies, providing adequate

security of energy supply, protecting consumers and addressing the problem of energy poverty.

Some **key concerns** that need further investigation:

- 1) **Nuclear Fuel Diversification:** As Kozloduy units 5 and 6 reactors generate almost one-third of the country's electricity and are expected to operate for the next 20 – 30 years, has any consideration been given to evaluate alternative fuel suppliers. There are diversification options available that will not only ensure alternative and reliable fuel supplies but will provide competitive pricing with enhanced fuel performance leading to diversification of one of the most vital energy generating facility in Bulgaria.
- 2) **Spent nuclear fuel storage facility:** What is the status of Kozloduy units 1 -4 on-site dry spent nuclear fuel storage facility? When will it be commissioned? Is spent fuel from units 1 – 4 still being shipped to Russia? If yes, what are the shipping costs? What is the total construction and commissioning cost of the facility?
- 3) **Shipment of Kozloduy units 5 - 6 spent nuclear fuel:** Has options to deploy transportable on-site spent nuclear fuel storage systems have been explored to store spent fuel from units 5 and 6? Such options can readily be deployed that would lead to sizeable reduction in cost savings currently being spent to ship the fuel. These systems will not only result in substantial savings but will enhance energy security of Bulgaria through diversifying and providing domestic controls for Bulgaria's critical nuclear energy facility.
- 4) **Funds spent on the modernization of Kozloduy nuclear power plant:** Are they managed transparently and in line with best European practices? What portion has been devoted to spent nuclear fuel storage?
- 5) **Expenses for the decommissioning of units 1-4 of Kozloduy nuclear power plant (NPP):** Are expenses managed transparently? Are resources fully optimized? What are the current and future project operating expenses? What is the trend of these expenses in different categories such as operations, maintenance, and management, etc.
- 6) **The Belene NPP project:** Does the project cost elements include all items such as decommissioning facilities, decontamination and decommissioning operations, radioactive waste management, and storage/disposal of spent nuclear fuel?
- 7) **Corrective actions taken to deal with any future gas crisis:** What measures have been taken to avoid a rerun of the 2009 gas crisis – alternative gas transportation routes or increasing gas reserves storage capacity, etc.? What actions have been taken to ensure timely switchover from gas to mazute for district heating plants? What specific actions have been taken for the storage facility – increased capacity, maximum daily output, how many days this storage can supply at adequate pressure and flow? Has a Risk Management Plan been developed to supply critical and essential facilities such as hospitals and national security infrastructure in case of continued emergency? Has a task force been established that coordinates the actions and monitors the situation on regular basis and interacts with other countries?

- 8) **Delays in addition of new capacities to the grid:** There have been considerable delays in adding new RES and coal capacities to the electricity grid. As an example *AES* has invested hundreds of millions of dollars in constructing the 670 MW lignite-fired Martiza Plant, while its connection to the grid is being held up. Such delays are sending a negative signal to the international investment community and depriving Bulgaria of the power that is generated in accordance with EU requirements.
- 9) **Renewable energy sources (RES):** How will the hike in electricity prices will be managed after the addition to the grid of all major RES projects planned in 2009-2010? What measures are taken to ensure balanced energy mix and gradual addition of RES capacities?
- 3) Improve **transparency and openness of the energy sector, especially in public procurement**, and create a leveled playing field for all market participants. Strategic decisions should be implemented based on: transparency of all contracts and procedures; independent expert reviews; minimizing the involvement of intermediaries.
- 4) Establish practice of **systematic data collection** and building of publicly available energy sector database. **Policy making should be data driven** and based on careful **cost-benefit analysis**.
- 5) Take **active position on EU initiatives** in the energy sector and outline an action plan on how the country will make full use of the European instruments in the energy sector, including new initiatives on increasing solidarity and responsibility among member states in the gas supply sector as well as the **four EU energy policy pillars**: (1) low carbon economy; (2) energy in emergency; (3) new avenues for energy and (4) providing consumers with more choice.

Recommended actions

In order to sustain the development of the Bulgarian energy sector while taking into consideration the complex impact of the major socio-economic trends, the following further steps should be taken:

- 1) Update and adopt a **national energy strategy** which: is governed by solid economic principles and based on data-driven analysis; takes into account the changed macroeconomic, social and political context; protects the consumer and the national interests; outlines alternative scenarios for development and corresponding actions.
- 2) Employ **diversification actions** in the nuclear sector and the gas storage facilities and transmission routes, including through active dialogue with other Black sea countries.

There seems to be a simple answer to current political and economic pressures - to ensure energy security, a nation needs to maintain a **diversity of fuels from a multiplicity of sources**. It is unwise for Bulgaria to become overly dependent on one type of fuel, or to become overly dependent on one supplier. However, a diversity of fuels and a multiplicity of sources, while being simple answers, are not so easy to accomplish. Achieving diversity of supply is long, hard work, involving diplomacy and requiring investment. And, above all, it entails true political commitment.