Bulgaria Power Sector:
Making the Transition to Financial Recovery and Market Liberalization

Summary Report

Reimbursable Technical Assistance

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Contents

List of Figures

List of Tables

Acknowledgements

This summary report presents the key findings of the technical assistance and advisory services provided to the Bulgarian Energy Holding in the context of a World Bank Reimbursable Advisory project. The project aims at providing a sound analytical basis and options and approaches that BEH and the government could consider in defining their policies and strategy for financial recovery and liberalization of the Bulgarian power market. The report was written by a World Bank team comprising Claudia Vasquez (task team lead), Prajakta Ajit Chitre, Arnaud Braud, Debabrata Chattopadhyay, Boryana Gotcheva, Gabriela Inchauste, Javier Inon, Eolina Milova, Jose Montes, and Victoria Levin. Hans-Arild Bredesen from Nord Pool Consulting also provided inputs to the report. The team is grateful to the Ministry of Energy, the Bulgarian Energy Holding, and sector stakeholders for their valuable support and cooperation in the preparation of this report.

Synopsis

- Bulgaria's power sector has been under considerable financial stress. Due to past government policies, the accumulated financial deficit in the regulated sector – which covers consumers with the right to opt for regulated tariffs – is estimated to have reached BGN 1.9 billion by the end of 2015 (2 percent of GDP).
- Recently-introduced measures have helped to significantly reduce the tariff deficit to BGN 71 million in 2015, compared to BGN 435 million in 2014.
- To consolidate the financial recovery, two additional measures would be required: (a) government support to reduce the cost of the repayment of the accumulated debt and (b) an increase in the Obligation to Society fee for all consumers by about five percent per year until 2019. For regulated consumers, the increase in the final tariff is expected to be only 2 percent per year in addition to inflation.
- The de facto single-buyer model (implemented by NEK) for the regulated sector has reached its limit and a new approach is needed to transition to a competitive power market that is compatible with the European Union's internal electricity market.
- The Independent Bulgarian Energy Exchange (IBEX)'s establishment of an organized Day-Ahead Market (DAM) represents significant progress. The next step is to increase the market's liquidity so that it becomes a credible referent price through (a) the implementation of market-based purchase of losses and (b) the market integration of generators with long-term power purchase agreements and benefiting from feed-in tariffs. The latter could be achieved by introducing contracts for difference (CfDs).
- The development of organized over-the-counter (OTC) and intraday electricity (IDM) markets should also be pursued to complement the DAM. With the objective of improving transparency and efficiency in OTC transactions, it is recommended that state-owned generators transition to the OTC platform.
- Another priority is coupling with the EU electricity market. This is the only sustainable way to address competition issues that may arise given that Bulgaria is a relatively small market and a small number of generators hold a dominant position.
- The process of full market liberalization should continue. A stepwise approach is recommended through the gradual implementation of market-based regulated pricing for households. This would allow household to adapt to market prices before full removal of regulated tariffs is decided.
- Critical to ensuring the social sustainability of the financial stabilization and transition to market-based pricing will be the protection of the poor via improvements in (a) social assistance programs in the short term and (b) the efficiency of energy use in the medium term.
- The social tariff currently proposed by the government will help mitigate the poverty impacts of tariff adjustments and of removal of regulated tariffs, if pursued. To ensure that eligible individuals and families take advantage of the program, it is recommended to maximize the use of existing administrative data for automatic enrollment. Expanding the eligibility criteria for large low-income households with consumption above 150 KWh per month should also be considered since these were identified as 'energy vulnerable'.
- An institutional set-up, supported by adequate legislation and regulation, will be needed. The role of the Security of the Electricity System Fund (SESF) would need to be enhanced if it is to become the entity collecting the revenues earmarked to repay the accumulated debt and the counterparty for the CfDs.
- Implementation challenges will also be substantial. There will be a need to build the capacity at the Energy and Water Regulatory Commission (EWRC) to enforce market surveillance and ensure its effective independence. Professional management and operational independence of IBEX, the SESF, and EWRC will also be important to add transparency and address management concerns highlighted by stakeholders.

Background

Bulgaria's power sector has been under considerable financial stress over the past few years. The accumulated financial deficit in the regulated sector[1] is estimated to have reached BGN 1.9 billion (2 percent of GDP) by the end of 2015. In addition, the de facto single-buyer model has reached its limit, and a new approach is needed so that Bulgaria can transition to a competitive power market that is compatible with the European Union's internal electricity market. Recent measures have been introduced to financially stabilize the sector and create an organized wholesale market, with encouraging initial results. However, continued efforts are needed to consolidate the transition to financial recovery and to promote competition.

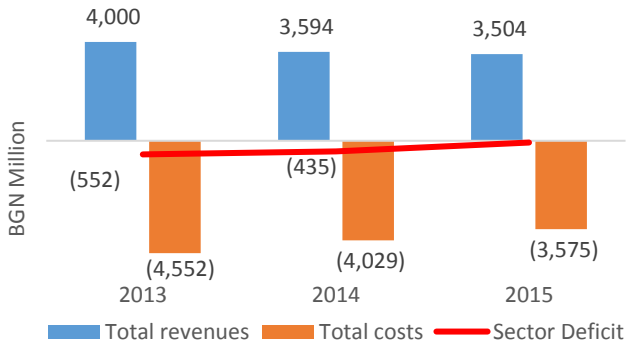
Bulgaria's power sector has considerable strengths

The sector has a diverse supply mix consisting mainly of hydropower, nuclear and renewable energy, and thermal-based generation. The firm capacity that can be relied on during system peak is below 10,000 MW, which is enough to meet peak demand in the short-to-medium term (7,817 MW in 2020) under normal conditions (that is, barring any sudden outages or fuel or transmission constraints). Bulgaria is also part of a strong interconnected power system that enhances system reliability while creating major export/import opportunities. Thanks to a strong baseload component comprising nuclear and coal, it is estimated that there is enough installed capacity to meet demand for under 72 BGN/MWh, which is low relative to regional wholesale generation prices. This is one of the reasons that Bulgaria is expected to remain a net exporter.

A growing mismatch of system revenues and costs has resulted in financial distress

The government of Bulgaria has implemented sector policies with the aim of supporting increased generation capacity and meeting its renewable energy targets. Since 2012, system costs have increased due to financial obligations arising from payments made in accordance with long-term power purchase agreements, feed-in tariffs and co-generation bonuses. According to the Energy and Water Regulatory Commission (EWRC), whereas the revenue requirements to cover these costs increased by about 20 percent between 2012 and 2015, the regulated sector shrank by about one third in accordance with the progressive market liberalization – putting significant pressure on tariffs. However, due to government policies, average tariffs for households set by EWRC decreased by about 7 percent between March 2013 and June 2015.

Figure 1: Financial position of the regulated sector



Source: World Bank staff calculations.

[1] In accordance with progressive market liberalization, electricity prices in Bulgaria have been progressively de-regulated for industrial consumers and commercial consumers in the medium- and low-voltage networks. Since 2015, only residential consumers (households) have had the right to opt for regulated tariffs; these consumers constitute the so-called 'regulated sector'.

As a result, a 'tariff deficit' arose due to a shortfall of revenues in the system – a product of tariffs that were below the cost borne by the energy companies to generate, transport, and commercialize electricity. The deficit reached a record high of BGN 552 million in 2013, as can be seen in Figure 1. The accumulated tariff deficit was most evident for the subsidiary of Bulgarian Energy Holding (BEH), the National Electricity Company (NEK), in its role as a de facto single buyer for the regulated sector. To support NEK's liquidity needs, BEH borrowed[2] and its credit rating was downgraded twice in 2015.

The tariff deficit also had a detrimental impact on the sector's energy companies throughout the value chain. NEK accumulated large arrears to the independent power producers (IPPs), renewable energy (RE) generators, and distribution and supply companies. By the end of 2014, almost all key companies in the sector had close to zero or negative net profit margins (defined as income/sales ratio). The wider economic effects of the tariff deficits were also evident as some energy companies had difficulty in meeting their payment obligations towards financial institutions, both domestic and international.

Important strides have been made to address the financial imbalances and start the transition to a competitive market

Recognizing the substantial financial imbalances in the sector, the government has introduced a series of measures aimed at increasing the system's revenues while decreasing its costs. Key actions include the following:

- Limit the quantities of power that are to be purchased at preferential prices by NEK from auto-producers (cogeneration plants) to only those quantities that are produced in a highly efficient, combined way (these volumes are determined by EWRC);
- Allocate the revenues from the sale of quotas for greenhouse gases to offset the costs by NEK for meeting its contractual (long-term PPAs) and legal (e.g. feed-in-tariffs and cogeneration bonuses) obligations. These revenues are collected in the Security of the Electricity System Fund (SESF), which is under the Ministry of Energy;
- Increase the Obligation to Society (OBS) fee from 18.9 BGN/MWh in 2014 to 37.9 BGN/MWh in the 2014–15 and 2015–16 regulatory periods. This is critical to ensuring that the generation costs set in the legal framework and contractual agreements are borne by all electricity consumers, whether or not they are in the regulated sector;
- For all power generators, including power and gas transmission companies, introduce a fee equivalent to 5 percent of monthly income from sales of electricity and from access and transmission to/through the grids (these revenues are also collected in the SESF);
- Restrict the quantities of electricity purchased by NEK from renewable energy producers at feed-in tariffs. These volumes would be based on the reference values in the regulatory decisions in which the feed-in tariffs were set. Electricity produced above such limits is to be sold on the free market; and
- Reduce the cost of power bought under the long-term PPAs. Reductions in the capacity prices paid to Maritsa Iztok 1 (AES) and Maritsa Iztok 3 (ContourGlobal) – by 14 percent and 15 percent, respectively – have already been agreed under the renegotiation of the long-term PPAs in April 2015 (in force since April 2016).

Some of these measures are ad hoc (such as the limits on the output of renewable energy generators and the fee on some companies' revenues) and most have had a detrimental impact on the financial situation of sector companies. However, they have helped to significantly reduce the tariff deficit. The 2015 deficit

[2] BEH issued two bonds for EUR 500 and 550 million in October 2013 and August 2016, respectively.

is estimated to be only BGN 71 million, compared to BGN 435 million in 2014, as can be seen in Figure 1 above.

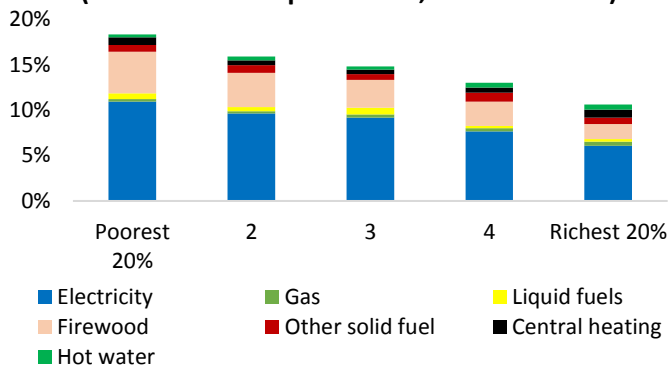
Important progress has also been achieved in putting in place a competitive wholesale market. In January 2016, a day-ahead market (DAM) was launched by the Independent Bulgarian Exchange (IBEX), which is a subsidiary of BEH. This is one of the critical steps in the transition to an EU-compatible market model. So far, the participation rate in the exchange is promising: 36 members have been registered, and daily trade volumes have been growing steadily. According to IBEX data, in September 2016 total trade volume reached about 221 GWh with average hourly traded volume of 307 MWh/h at an average price of €30.88/MWh.

The government is also working on addressing affordability concerns

The cost of energy, and electricity in particular, is an important policy issue in Bulgaria, as demonstrated in February 2013 when the government resigned following mass protests over unusually high electricity bills, and public perception of mismanagement and corruption. Government policies since then have attempted to moderate the burden of electricity expenditures by not allowing NEK to pass through costs to consumers, essentially providing a subsidy to all consumers, irrespective of their income levels or vulnerability status.

Electricity is the main source of energy for most households, regardless of type of settlement, income, or poverty status.[3] In fact, energy makes up 14 percent of total spending on average. However, as shown in Figure 2, the poorest households (those in the lowest 20 percent of income distribution) spend 17.4 percent of their total budgets on energy, whereas the wealthiest households in the top 20 percent of income distribution spend only 11.9 percent. *Energy-vulnerable households* are defined as those spending more than 10 percent of their incomes in energy. In order to protect poor and vulnerable households from the impacts of tariff increases it is necessary to introduce measures to make electricity affordable for low-income groups and assist with other mitigation measures such as household energy efficiency investments.

Figure 2: Energy expenditures by expenditure quintile (share of total expenditures, all households)



Source: World Bank staff calculations based on 2014 Households Budget Survey

The government has proposed introducing a 'social tariff' and is exploring measures to support energy-efficiency improvements in multi-family buildings. The proposed program would cover up to 70 percent of the electricity component (e.g. commodity) of the tariff for vulnerable households with electricity consumption below 100-150 KWh per month. Eligible groups include: (1) elderly over 70 years of age, living alone, with total income below the national poverty line; (2) persons with over 90 percent reduced

[3] Following Eurostat, we define poor persons as those with a disposable income that is below 60 percent of the national median equivalized disposable income after social transfers.

ability, with an attendant (regardless of income); (3) families with disabled children, with an attendant (regardless of income); and (4) persons and families, receiving the targeted heating allowance.

But new steps are needed to consolidate the financial recovery and put in place a sustainable market design

The challenge for the government going forward is to consolidate recent gains by implementing a comprehensive program to put the sector on a financially and socially sustainable path. Such a program should take into account the specificities of the Bulgarian power sector, which is characterized by (a) a significant amount of debt accumulated over the past few years; (b) the relatively high proportion of electricity expenditures in household budgets, especially for the poorest; and (c) a significant share of the generation sold at prices set by contractual and legal obligations. These factors call for a flexible approach to implement a gradual transition focusing on the areas described below.

Focus Area 1: From financial stabilization to recovery

For the power sector to achieve a sustainable financial recovery, the following challenges need to be addressed:

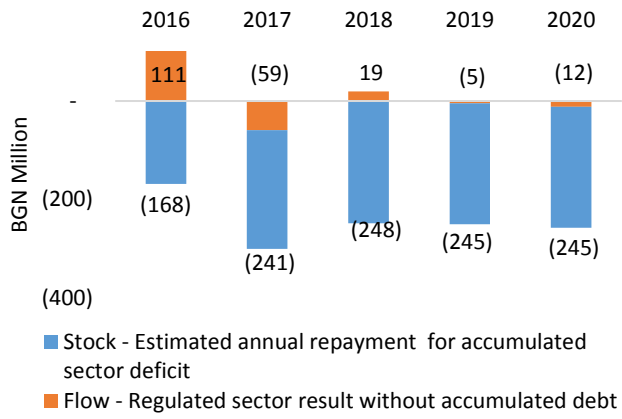
- Address the large stock of accumulated debt must be repaid over the coming years. Based on a sector-wide financial model,[4] we estimate that if measures taken so far are fully implemented, the gap between revenues and costs on a yearly basis (flow) will be almost close. The losses will be modest as shown in Figure 3a, except for 2016 and 2017 due to reimbursement to energy intensive industries for payments in excess made between August 2015 and August 2016 for the Obligations to Society fee.[5] These annual deficits will add to the large amount of accumulated debt, which as of December 2015 was estimated at BGN 1.9 billion. This debt is currently being financed by BEH through the issuance of two five-year bonds (with maturity dates of November 2018 and August 2021) and with financing costs above the government's borrowing costs (annual interest rates of 4.250 percent and 4.875 percent, respectively).

- The financial situation, while stabilized, is fragile. As Figure 3b shows, based on a sensitivity analysis, the model also shows that if additional measures are not implemented (scenario 2, orange line – status quo), the cumulative sector deficit will grow again to BGN 1093 million by 2020. In addition, if some of the measures already introduced by the government are not fully implemented[6] (scenario 1, red line – high deficit), the cumulative deficit would rise even further

[4] To assess the financial gap and identify short-term and medium-term options to financially stabilize the power sector, the World Bank built a sector-wide financial model. The model covers the 2013–15 (historical) and 2016–20 (forecast) periods. It provides a broad overview of, and framework for assessing, the financial situation of the sector.
[5] In August 2016, the European Commission did not raised objection to a reduction of the contribution to finance the support for electricity from renewable sources for energy-intensive users. The discount is between 40% to 85% of the so-called 'green component' which is included in the Contribution to Society Fee according to the level of electro-intensity of industries. The measure is effective since August 1st 2015 until December 31st, 2020. http://ec.europa.eu/competition/state_aid/cases/265056/265056_1780807_70_2.pdf
[6] Key differences with scenario 2 (status quo) are that RES mandatory purchase volumes, and the revenues from the sale of CO2 quantities are back to historical levels, and the 5 percent fee on generators' revenues is not extended to the power transmission and gas transmission companies. The accumulated debt is also repaid over a shorter tenor with higher interest rates.

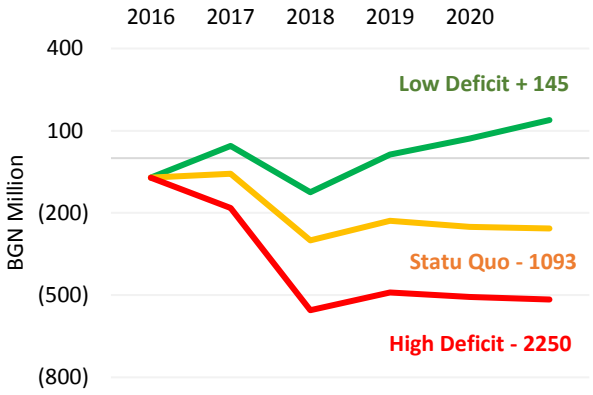
to BGN 2,250 million by 2020. This sensitivity analysis underscores the fragility of the recent recovery and highlights the risk that the sector deficit will remain a burden for Bulgaria.

Figure 3a: Regulated sector forecasted financial position



Source: World Bank staff calculations.

Figure 3b: Regulated sector financial position – sensitivity analysis



Source: World Bank staff calculations.

The measures recently implemented by the government leave little room for maneuver since they already use most of the levers available for achieving cost reductions. For this reason, two additional measures would be required to provide adequate resources to cover all system costs on an annual basis and to repay the existing stock of debt:

Measure 1: Reduce the cost of repaying the accumulated debt by refinancing BEH bonds on better financing terms. As discussed above, past government policies have led to the accumulation of a large stock of debt in the sector. To reduce the burden of the repayment of the debt, BEH bonds have to be refinanced over a longer repayment period ("tenor") and with lower interest rates. To this end, we recommend that the government either issues bonds itself or provides a sovereign guarantee in line with EU's State Aide rules. Government support would help reduce substantially the amount of debt repayment required by extending the tenor and lowering the interest rates. For example, extending the tenor of the debt from 8 to 15 years and reducing the financing cost from about 5.0 percent to 3.25 percent would reduce the required provision every year from 286 BGN million to 162 BGN million (assuming a mortgage-style repayment).

An important consideration regarding the tenor for policy makers is to choose an adequate time period for the sector to carry the burden of the accumulated debt. If it is too short (e.g., 5 years), the burden may be too high. However, if it is too long (e.g., 20 years), the burden would be unfairly passed onto future customers and would require repeated financial restructuring.

Measure 2: Increase the Obligation to Society fee for all consumers. Assuming that the measures adopted by the government are fully implemented, we estimate that a 5 percent increase of the Obligation to Society fee every year until 2019 is also needed (in nominal terms, without the inflation impact for the 2016–20 period). Because the Obligation to Society fee is only one component of the end-user tariffs (for regulated consumers) and prices (for consumers in the free market), the actual increase for consumers would be modest. For regulated consumers it is estimated to be about two percent per year in addition

to the inflation adjustment. The specific adjustment to the Obligation to Society fee should be determined by the regulator, ERWC, based on more detailed and updated data.

Focus Area 2: Transition to a new market model

To form a fully competitive electricity market compatible with the EU target model, the following challenges would need to be addressed:

- **The current single-buyer model is not suitable to form a fully competitive market.** The process of market liberalization cannot be sustained within the existing market structure, consisting as it does of (a) a *regulated* market (covering about 40 percent of the net generation, with the NEK acting as a de facto single buyer) and (b) a *free* market, covering the remaining 60 percent and implemented through bilateral over-the-counter trading.
- **The Day Ahead Market (DAM) had a good start, but more liquidity is needed so that it becomes a trusted reference price.** Liquidity in the DAM will be supported by BEH's Liquidity Provider Agreement with IBEX under the EU Directorate-General for Competition case.[7] This agreement will have a positive effect on market liquidity. However, it is important that DAM trading grows beyond such volumes to a point where it can serve as a reliable reference price in Bulgaria. In the medium to long-term, market coupling with the EU electricity market will the only sustainable way to address liquidity issues and the fact that Bulgaria is a relatively small market with few players (see below).
- **Market structure is concentrated, leaving it open to potential abuse of market power, and a large share of generation is tied to existing contractual and legal obligations.** Subsidiaries of the BEH hold a dominant position in the Bulgarian electricity market with about 60 of gross domestic generation. Although these entities have operational autonomy, there is a risk of market power if adequate market surveillance is not put in place. In addition, about 23 percent of domestic generation is contracted under long-term power purchase agreements (PPAs) or benefits from feed-in tariffs (FiTs) with prices set by the specific clauses/provisions set out in the contracts/regulations.

Within this context, the following four measures are recommended:

Measure 1: Implement market-based purchase of losses. Additional traded volumes in the DAM could be secured if the transmission system operator (TSO/ESO) and distribution system operators (DSOs) are obligated to buy at least a share of their losses from the DAM, with the remaining share to be bought through tendering a long-term contract. This approach is implemented in many European markets for liquidity reasons. It could be envisioned, for instance, that both the ESO and the DSOs procure up to 70 percent in long-term contracts to secure the base cost of the losses, and then procure the remaining volumes from the DAM. It should be noted, however, that while this measure will have positive effects in terms of improving the liquidity in the DAM and providing the right incentives to decrease losses, it may

[7] Case number 39767. http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=1_39767. According to this agreement, BEH subsidiaries will provide fixed quantities on the DAM Platform with an "offer price" based on their marginal costs. Such fixed quantities will increase from 293 MW (9.2 percent of net domestic consumption) in Year 1 to 807 MW (23.6 percent of net consumption) by Year 5.

have an adverse impact on the sector's financial deficit,[8] which would need to be collected so that the system's financial balance is not affected.

Measure 2: Integrate IPPs with long-term power purchase agreements and producers benefiting from feed-in tariffs into the competitive wholesale market*.** Integration holds the promise of benefiting consumers through increased competition, liquidity and efficiency in the power markets while protecting the IPPs and RE revenue stability during the transition. One approach that has been used in other EU countries and is deemed adequate in the Bulgarian context is to convert the power purchase agreement, or offtake obligation, into a financial mechanism known as a ***contract for difference **(CfD).** It is also important to take into consideration some phasing in of CfDs into the marketplace. It is recommended that contract volumes for IPPs with long-term PPAs be introduced first, followed by that of the large RE producers and, finally, medium and smaller-scale RE producers and perhaps cogenerators. CfDs could also be used a transition mechanism support market liberalization for the regulated sector. In this case, supply companies could benefit from a CfD to procure the power required to cover "regulated volumes'. This would progressively expose consumers to market prices (see Focus area 3 for more details).

Table 1 illustrates the key design parameters. Specific studies and consultation with stakeholders will be required to translate these parameters into CfDs with defined rules and implementation procedures.

Table 1. CfDs - key design parameters

Design parameter	Comment
The strike price	To be based on the original terms set out in the contract/regulation
The counterparty	Security of the Electricity System Fund (see discussion below)
Reference price	The day-ahead market price from IBEX should be used as the reference price for the settlement
Physical delivery	Even though the CfD will result in a financial flow of money between the parties, it also represents an underlying physical volume that has to be produced or consumed
Sourcing	This physical volume requirement needs to be sourced in the market from which the reference price is obtained (e.g. the DAM)
Additional key design parameters that would apply to specific stakeholders	
Independent power producers with long-term PPAs	• Supply caps • Strike prices taking into account capacity payments and supply price
RE generators benefiting from feed-in tariffs	• Volume caps or net specific generation • Individual balance responsibility or as part of a balancing group, • Phasing (integrate larger producers first)
Supply companies serving regulated consumers	• strike price could be set at the estimated forward market price in neighboring countries (no forward markets in IBEX yet) • The methodology of, and responsibility for, estimation of regulated volumes, strike price, etc. to be done by EWRC.

Measure 3: Prepare for market coupling and implement import-export zones. Coupling with the EU electricity market is the only sustainable solutions to address the competition issues arising from the fact the Bulgaria is a relatively small market with few generators. The EU target model for the day-ahead timeframe is the European Price Coupling (EPC), which simultaneously determines volumes and prices in all relevant zones, based on the marginal pricing principle. Market coupling would benefit Bulgaria

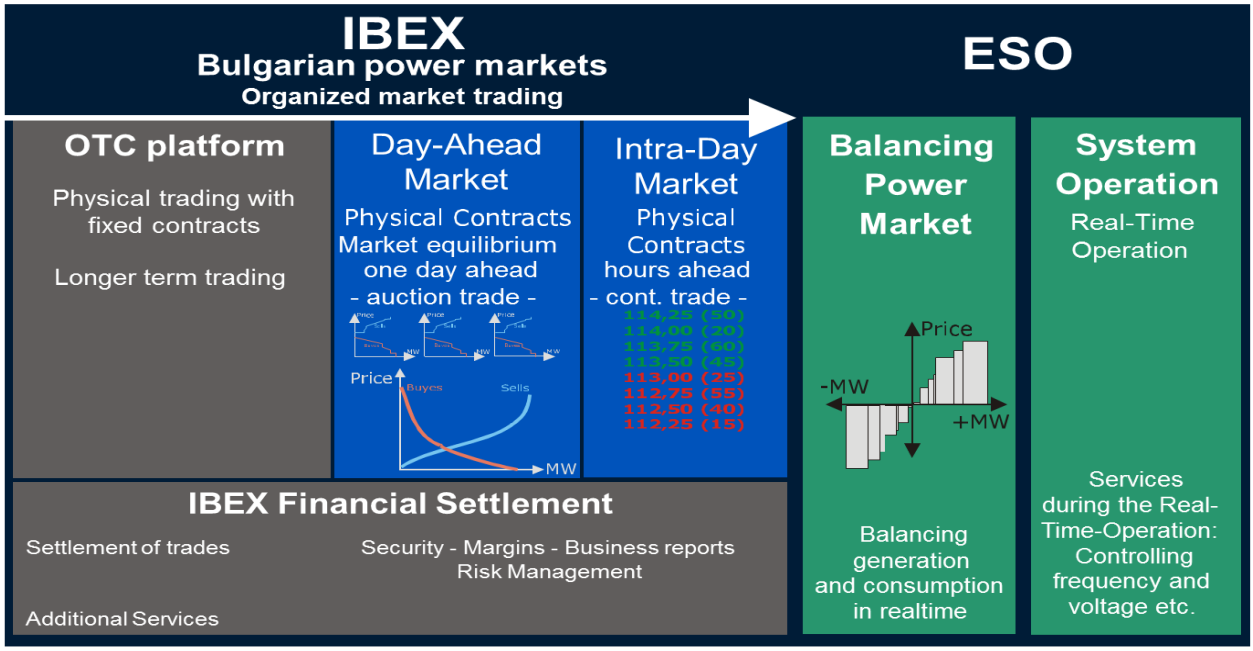
[8] Currently, losses are purchased at a price regulated by EWRC, which is about 30 BGN/MWh for the 2015–16 regulatory period (excluding the Obligation to Society contribution, fees for access to the high-voltage grid, and transmission fees). If losses were to be priced at market levels, they would be at least double current DAM prices.

because IBEX is a member of both Price Coupling of the Regions (PCR) and Multi-Regional Coupling (MRC), which are the established cooperation mechanisms for implementing market coupling. This means that the Bulgarian market will be able to couple as soon as MRC has reached one or more of its neighboring countries. An option for Bulgaria is to join the 4M Market Coupling (4M MC) project, which integrates the electricity DAMs of OTE in Czech Republic, HUPX in Hungary, OPCOM in Romania and OKTE in Slovakia. It is recommended that IBEX initiates discussions with Romania's TSO and power exchange (OPCOM) to prepare the implementation of an implicit-auction–based market coupling for the RO-BG (Romania-Bulgaria) interconnector, which would allow for full coupling once 4M MC implements MRC.

The implementation of import/exports zones should also be explored as a transitional measure to increase regional trade and liquidity in the DAM prior to the full coupling of the Bulgarian market area to the Pan-European market. Import/export zones have been used as a transitional measure in other EU countries (Latvia, Poland, Nordics, etc.) for power trade with neighboring areas prior to coupling. For the import and export areas to work, the ESO has to give some amount of cross-border trading capacity to the DAM for implicit auctioning. Options for establishing import/export zones include Turkey (as a non-EU member), Greece (not fully implementing the EU target model), and FYROM. It is recommended that IBEX, ESO and the EWRC jointly decide on their preferred set-up and key parameters for the import-export zone and approach at least one of the three potential candidates listed above.

Measure 4: Develop organized OTC and Intraday electricity markets: To complement the DAM and make available options to trade in different time-frames to market participants, it is also recommended that an organized Intraday Market (IDM) and Over-the-Counter Market (OTC) are developed. The conceptual market design is presented in Figure 4.

Figure 4: Conceptual market design



Source: Nord Pool Consulting.

The Intraday Market is a next step designed to augment and enhance physical power trading in the DAM. The IDM opens after the DAM auction results are finalized. This allows market participants to adjust their positions closer to the delivery hours. The introduction of the IDM in Bulgaria is likely to benefit generators

that are balance responsible and face uncertainty in forecasting their output. For example, the unpredictability of wind power generation makes it harder to trade in the DAM, where participants need to schedule binding physical deliveries one day in advance. As a result, the introduction of the IDM could help reduce the balancing costs of such market participants. It is recommended that IBEX implements its plans to open its IDM platform by the second quarter of 2017.

The Over-the-Counter Market is important because all trading in the free market is conducted through bilateral deals. Putting in place an organized OTC platform would create an open and transparent marketplace for long-term trading for physical delivery with standardized products. Auction session results are publicly available; this includes volumes, prices and entities participating in the session. It would allow the trading of base load, peak load, and off-peak load, among others, for different delivery periods including day, week, month, quarter, semester and year. This would help generators with less flexibility in their output volumes (such as nuclear power plants) to more actively participate in the organized market.

With the objective of improving transparency and efficiency in OTC transactions, it is recommended that state-owned generators transition to an organized OTC platform for all the volumes to be sold beyond the hourly and daily timeframe. Currently, these generators run public tenders managed through individual trading platforms to sell their output above the quantities required to supply the regulated sector. IBEX has selected a service provider to develop an electronic trading platform for the OTC market, and it is expected that the platform will be fully operational by the fourth quarter of 2016. It is recommended that all state-owned generators transition to the new platform within a 12-month period, which corresponds to the maximum duration of contracts currently auctioned.

Focus Area 3: Market liberalization and affordability

Bulgaria has liberalized its electricity market since 2007, meaning that consumers may choose their supplier. As of 2016, only residential consumers have the right to opt for regulated prices set by the EWRC. The question now is whether Bulgaria should also consider removing regulated prices for residential consumers. While retail-market and end-user price deregulation could increase competition between the suppliers and give end-users greater choice, it also exposes them to greater price volatility. In addition, the recommendation to increase the Obligation to Society fee by 5 percent per year would likely imply a tariff adjustment for households. Therefore, price de-regulation, if pursued, and adjustments to the Obligation to Society fee, should be accompanied by improvements in (a) protection of the poor and vulnerable via social assistance programs in the short term and (b) the efficiency of energy use in the medium-to-long term. To achieve these goals, the following challenges need to be addressed:

- **Regulated tariffs are not based on market prices.** The commodity component of regulated tariffs is determined by EWRC based on the revenue required for NEK to cover its purchase costs. Such approach might distort the market for end-users when suppliers can procure their electricity from the open wholesale market through IBEX DAM at lower prices (expected between BGN 50 to 75 BGN/MWH) than the prices at which they are obligated to sell electricity to their customers (set at 78.70 BGN/MWh not including the Obligation to Society Fee).

- **There are about 444,000 households that are most vulnerable to increases in electricity prices.** These are households that are both income-poor and energy-vulnerable, in the bottom 25 percent of income distribution and spending more than 10 percent of their budgets on energy. Such households are dispersed throughout the country, with 49 percent living in thinly-populated areas, and 26.2 percent living in densely-populated areas. About 6.7 percent of these households

have a disabled member, 18.8 percent have an unemployed head of household, and 24.5 percent are single elderly adults above age 70. An additional 149,000 households are income-poor and could quickly become energy-vulnerable should energy prices increase.

- **The existing social assistance programs are inadequate to cover households at risk**. They have low coverage and make up a relatively small share of the incomes of the poor. Only 14 percent of poor households are covered by the heating allowance, and only 5 percent are covered by the minimum income program. For the households that do receive these benefits, the heating allowance makes up 5 percent of their incomes.

- **The proposed social tariff would only partially mitigate the poverty effects of the increase in electricity tariffs.** The social tariff is a positive first step in improving the affordability of electricity services to poor and vulnerable households. However, the protection afforded by the social tariff would be constrained by its relatively small size and the proposed eligibility criteria. The social tariff is expected to amount to about BGN 187 per household per year, making up about 7 percent of the incomes of the poor. Many poor households, in particular those with many children, would not be eligible (Figure 5). Those households that are eligible would be only partially be covered, since their consumption usually exceeds the 100-150 KWh allowance for the social tariff. Implementation mechanisms such as the method and process for beneficiary identification will also be critical to the success of the program in the short-term.

Figure 5. Social tariff eligibility (share of poor households)

Source: World Bank estimates based on 2014 EU SILC.

Based on these challenges, it is recommended that the government implements the following measures:

Market liberalization

Measure 1. Implement market-based regulated pricing for households, meaning that the supply costs in the regulated tariff (e.g. commodity) is based on the DAM price. Experience worldwide with full de-regulation of end-user prices has been mixed. In the case of Bulgaria a stepwise approach is recommended to retail market deregulation. In the first phase, it is recommended that households are exposed to market prices gradually. This could be achieved by indexing the commodity part of the tariff for households to the DAM price based on three levels, with the remaining part of the tariff to be covered by a CfD between the suppliers (supply companies) and the CfD counterparty. The following is an example of this mechanism:

- *Base level*: [50 percent] of the underlying supply costs (i.e., commodity costs) of the end-users are based on market prices (DAM) and [50 percent] are covered under a CfD.
- *Medium level*: [70 percent] of the underlying supply costs (commodity costs) of the end-users are based on market prices (DAM) and [30 percent] are covered under a CfD.
- *High level*: [100 percent] of the underlying supply costs (commodity costs) of the end-users are based on market prices (as set in the DAM).

This will allow the end-users to adapt to the market prices gradually. The number of steps, and the percentage of the commodity price to be covered in each, can be further refined and adjusted over time. Once full indexation to market prices is achieved, full removal of regulated prices should be considered.

Measure 2. Implement actions aimed at informing and empowering consumers about the process and market-based pricing and the rationale for tariff adjustments. Explaining the need for tariff adjustments clearly and consistently, as well as raising public awareness to the social protection measures to be undertaken, before the full removal of regulated prices helps build credibility and public understanding of the process. Such measures could include national information campaigns, citizen dialogue on energy issues, as well as EWRC initiatives to facilitate switching, such as decision on standard profiles and reduction in switching times.

Protection of vulnerable consumers

Measure 3. Maximize the use of existing administrative data to ensure that eligible beneficiaries are automatically enrolled in the social tariff scheme. For the social tariff to be effective, eligible individuals and families need to take advantage of the social tariff scheme. In other EU countries that have implemented social tariff schemes, beneficiary identification is done through either (a) electricity distribution companies (such as in UK and Belgium); (b) administrative bodies, such as ministerial departments or municipalities, that identify vulnerable beneficiaries for other programs (such as in Lithuania, Serbia, and Greece); or (3) a combination of the two. In the case of Bulgaria, it is recommended that, to the extent possible, existing administrative data are used to automatically enroll those eligible individuals and families (e.g., recipients of the heating allowance, disabled adults and children). This would help avoid the risks of lower take-up rates (as has happened in France) – particularly if broad-based, effective communication campaigns are absent and if the application involves time-consuming procedures. Once eligible beneficiaries are identified, the benefit could be administered via supply companies' billings and payments systems.

Measure 4. Consider expanding the eligibility criteria for the social tariff to cover large households with income below the poverty line while increasing the benefit amount. To further strengthen the effectiveness of the social tariff program the government could include large families (e.g., households with more than three members) living in thinly-populated areas with a per-capita income below the poverty line as a beneficiary group and increase the social tariff from 150 KWh to 250 KWh of electricity consumption per month for these households. This would address the fact that most households in villages consume more than 150 KWh of electricity per month, as well as the fact that many large households in thinly-populated areas would otherwise not be eligible. We estimate that expanding the coverage to this group would reduce the poverty impact by one 0.8 percentage points – that is, 220,000 households in poverty at an overall program cost of BGN 205 million per year in 2017-2019 (compared to an average of BGN 69 million now).

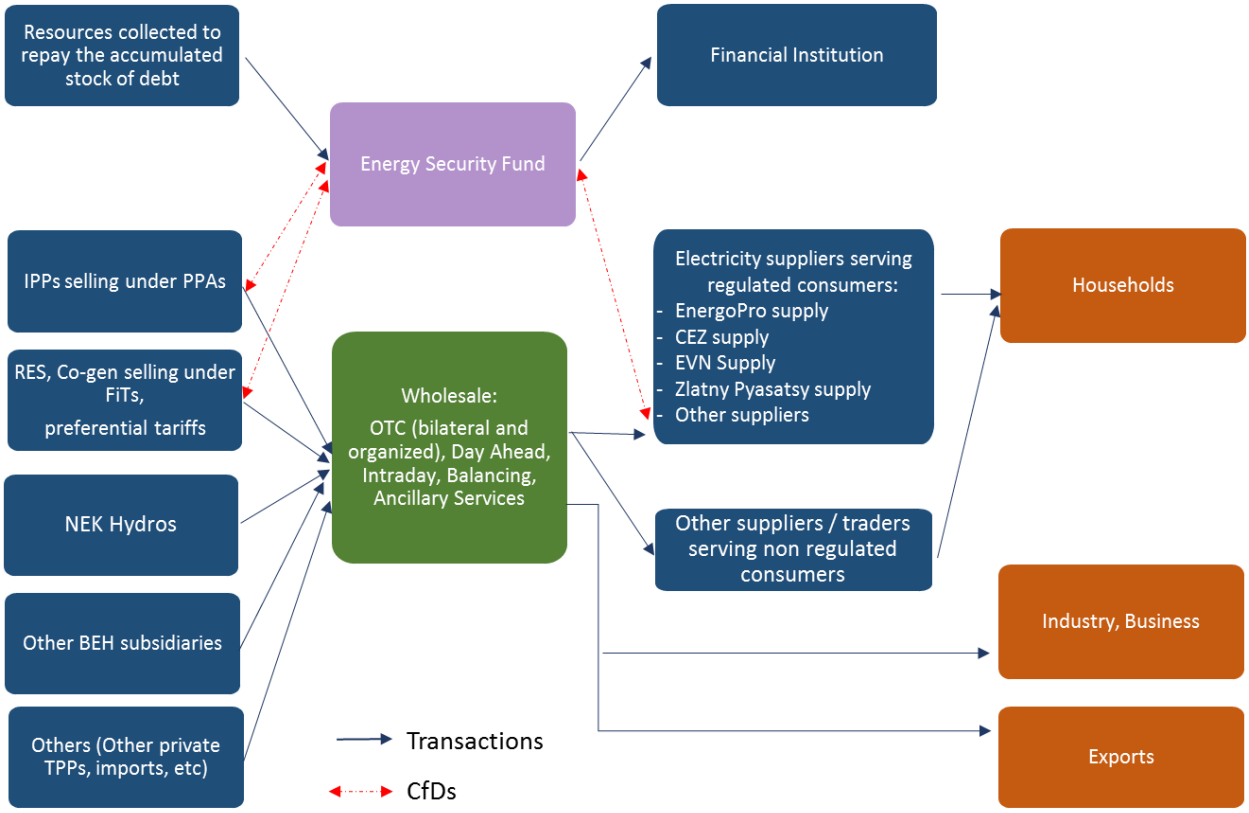
Measure 5. Integrate the social tariff with the existing social assistance system in the medium term by expanding social assistance programs. The temporary nature of the social tariff scheme is predicated on the move towards a more holistic approach to social protection. This approach would (a) integrate electricity support within existing social assistance schemes and increase their coverage, and (b) combine financial support with non-financial measures to support energy-vulnerable consumers. Among the non-financial measures, the ongoing energy efficiency programs (such as the National Program for Energy Efficiency in Residential Buildings) could be revisited to provide targeted grant support to low-income households.

Focus Area 4: Institutional set-up to support the transition

The transition to financial recovery and to a competitive market based on these recommendations would require an institutional set-up supported by adequate legislation and regulations. Implementation challenges will also be significant. Capacity would need to be built within sector institutions to design, consult with sector stakeholders, translate into legislation and regulations, and oversee the implementation of such measures. Sector stakeholders would also need to build internal capacity to operate in the new market and institutional environment. Critical components for putting in place the institutional set-up for the transition include:

Measure 1: Enhance the role of the Security of the Electricity System Fund (SESF). In the case of Bulgaria, the SESF already collects funds aiming at covering – at least partially – the tariff deficit. It is recommended that the role of the SESF is expanded to (a) become the entity collecting resources (the Obligation to Society fee and other revenues) earmarked to compensate the tariff deficit, (b) becomes the counterparty to the CfDs and (c) is the entity responsible for repaying the accumulated stock of debt. The set-up is illustrated in Figure 6. As mentioned earlier, some form of indirect government support, through state guarantees, would be necessary to improve the terms of the debt repayment and enhance the creditworthiness of the SESF as a CfD counterparty. Finally, given the central role of the SESF, ensuring professional management and operational independence will be critical in ensuring that resources will be managed in an efficient and transparent way.

Figure 6. Transition scheme to competitive electricity markets



Source: World Bank staff.

Measure 2: Build capacity and ensure the independence of the EWRC. Progress has been achieved at improving the independence of EWRC with the amendments to the Energy Law in April 2015. Based on this new legal framework, continuous efforts will be needed to ensure the effective independence of EWRC. The implementation of organized competitive power markets in Bulgaria will also require active surveillance by EWRC to ensure market integrity and transparency. Specifically, EWRC would have to build internal capacity to enforce the EU's Regulation on Energy Market Integrity and Transparency (REMIT).

Measure 3: Improve the independence and governance of IBEX. IBEX is at the core of the proposed transition. Ensuring its operational independence and good governance will be critical to the establishment of a competitive electricity market. A first positive step to achieve this goal is transferring the ownership of IBEX's capital from BEH to the Bulgarian Ministry of Finance in connection with EU above mentioned Directorate-General Competition case[9]. Going forward, it is recommended that the government undertakes the divestiture of the power exchange to a buyer (unconnected to BEH or the Bulgarian State) to address transparency and management concerns highlighted by stakeholders.

The recommendations made in this summary report are presented to the government of Bulgaria as a potential path toward a more financially and socially sustainable energy sector.

[9] Case number 39767. http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=1_39767.