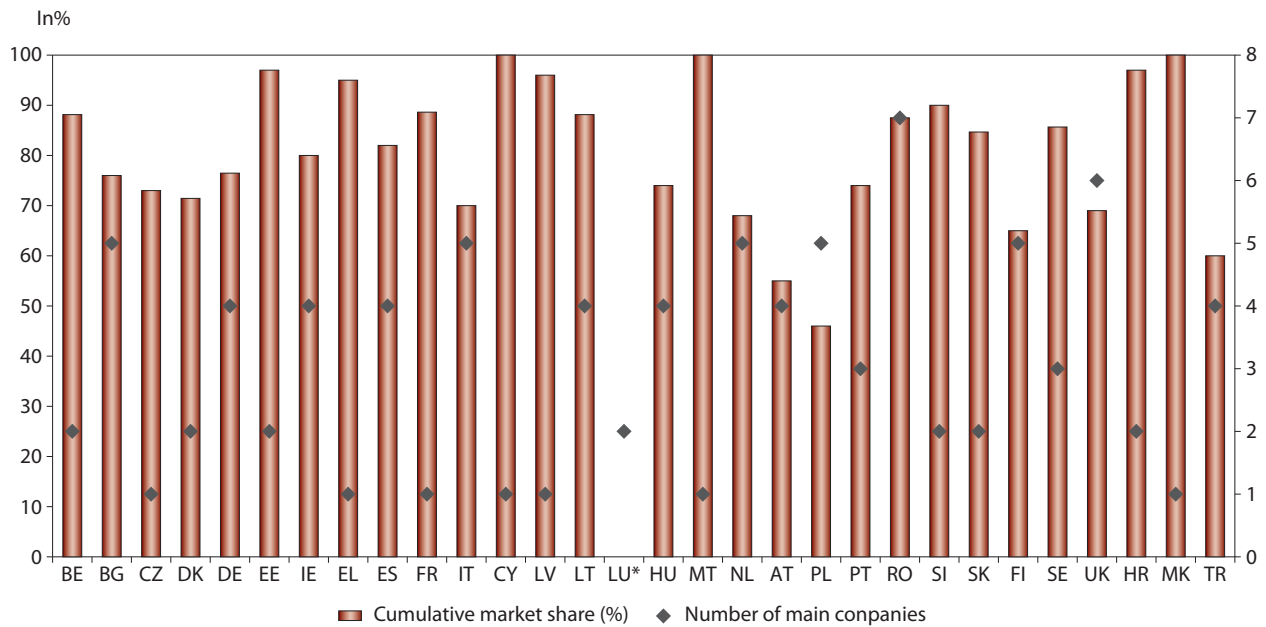


IV. GOVERNANCE RISK AREAS

4.1. MANAGEMENT OF STATE-OWNED ENERGY COMPANIES

The energy sector by default is one of the most complex – it is technically challenging, it is heavily monopolized, it has a large number and variety of vested business and geopolitical interests and it is second only to the military sector when it comes to security concerns and the respective abuse of those concerns. Those are some of the reasons why the sector is heavily regulated and on the whole largely consolidated. These sector-specific complexities, taken in the environment of high level of corruption risk and actual ‘state-capture’, which were touched upon in the previous section, make the task of state management of the energy sector almost impossible to handle. In order to have an effective policy making and decision making process in existing governance structures, roles and responsibilities should be revised and transparency increased.

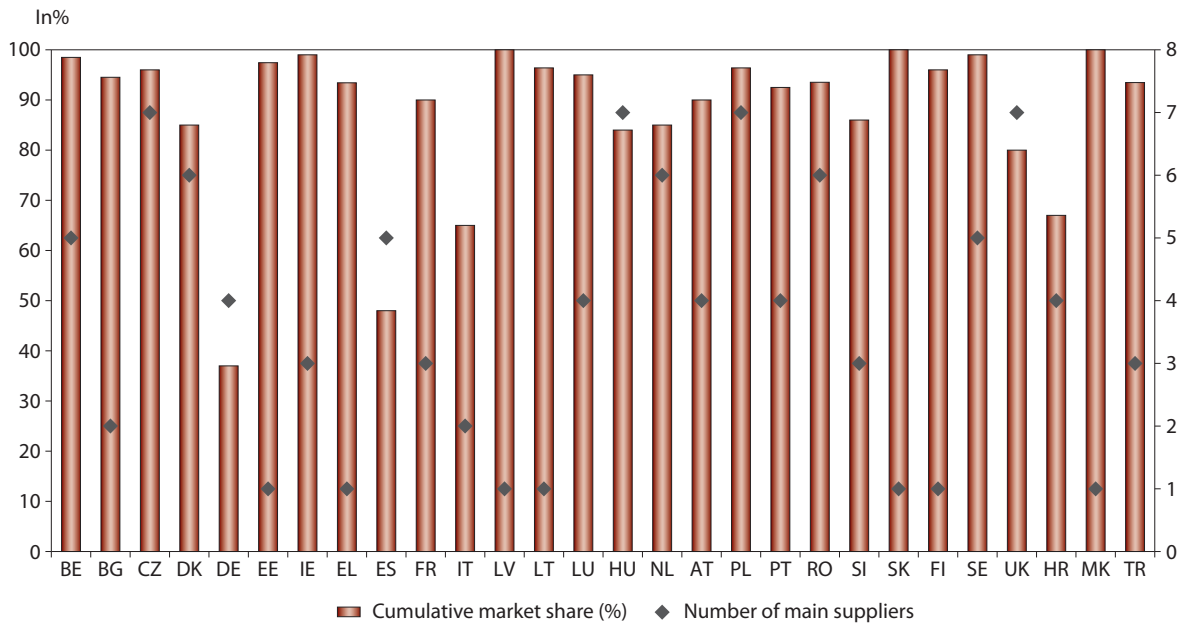
FIGURE 19. NUMBER OF MAIN ELECTRICITY GENERATING COMPANIES AND THEIR CUMULATIVE MARKET SHARE (2006)



* Information on market shares in generation not available

Source: In-depth Review of Energy Efficiency: Bulgaria (2008), Energy Charter Secretariat; Eurostat

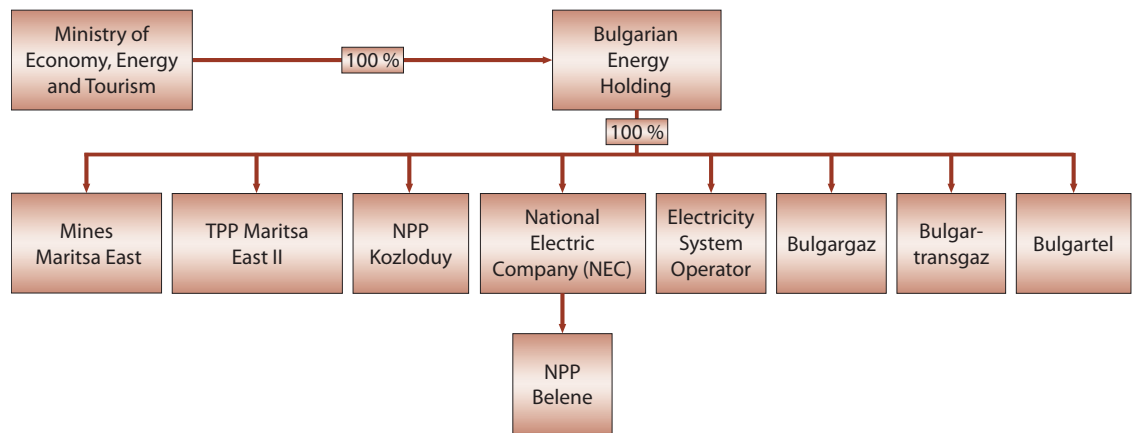
FIGURE 20. NUMBER OF MAIN NATURAL GAS SUPPLIERS TO FINAL CONSUMERS AND THEIR CUMULATIVE MARKET SHARE (2006)



Source: In-depth Review of Energy Efficiency: Bulgaria (2008), Energy Charter Secretariat; Eurostat

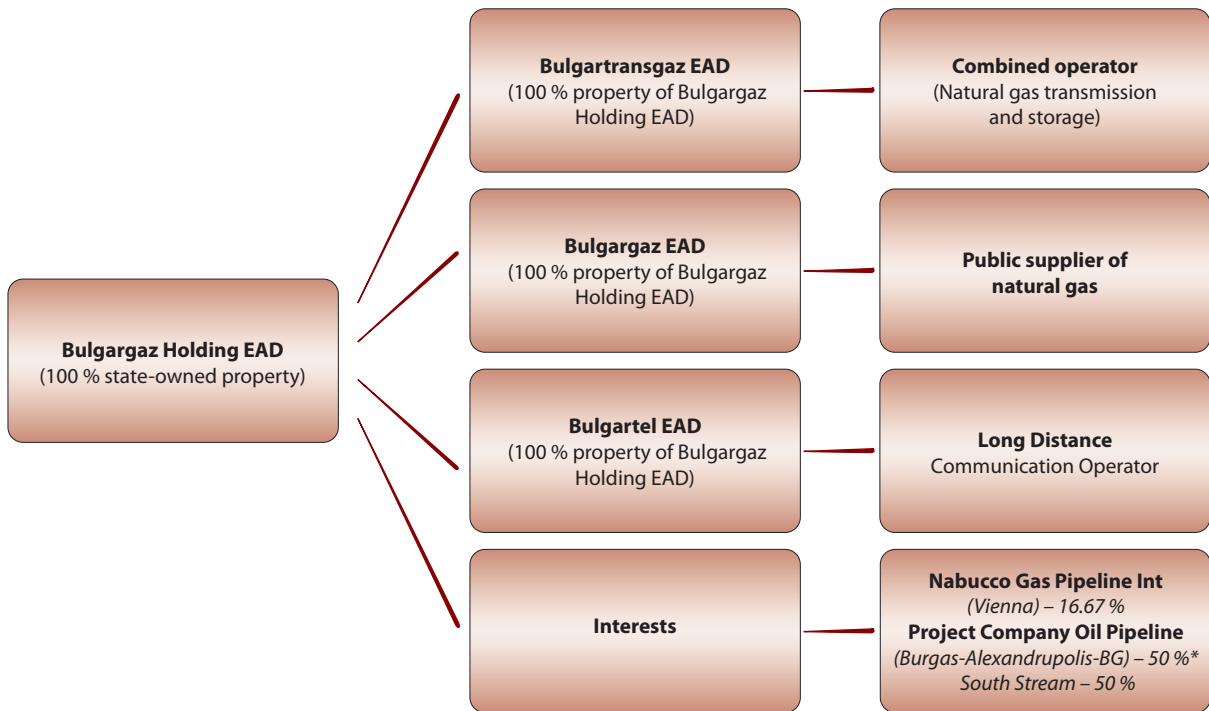
In an effort to address these complexities and centralize management Bulgarian Energy Holding (BEH) was created in Sept 2008. BEH’s listed activities cover the full range of possible energy-related activities: from extract and exploitation, to electricity production and its trade. BEH is 100% state owned, although its legal format of “акционерно дружество” (roughly translated as ‘shareholder company’) would make a potential IPO in the future much easier to perform. The Holding includes: Maritza-Iztok mines, TPP Maritza-Iztok 2, NPP Kozloduy, NEC, ESO, Bulgargaz, Bulgartransgas and Bulgartel. The separate companies within the holding structure retain their operative independence and licenses but they are wholly owned and directly subordinate to the corporate headquarters of BEH. The result of this consolidation, as BEH itself boasts, is the creation of one of the biggest energy companies in the region and a country leader, whose assets are valued at ~8.5 bln BGN, consolidated revenues amount to ~ 3.6 bln and the total number of employees is 21 000 people. The new NPP under construction (Belene) comes under NEC, while the Nabucco and Burgas-Alexandropolis come on Bulgargaz’ ‘books’.

FIGURE 21. STRUCTURE OF BULGARIAN ENERGY HOLDING



Source: Bulgarian Energy Holding (<http://www.bgenh.com/>)

FIGURE 22. STRUCTURE OF BULGARGAZ HOLDING



* BEH divested its shares in 2010.

Source: Bulgargaz Annual Report 2008.

Adding to the ‘spaghetti bowl’ structure is BEH’s participation in other holdings and large projects as seen from Table 18.

TABLE 18. INVESTMENTS IN OTHER COMPANIES/PROJECTS

Investments <i>(in thousands BGN)</i>	2008		2007	
	Share	Amount of investments	Share	Amount of investments
Enel Maritsa East 3 AD	27%	116,327	27%	132,011
Enel Operations Bulgaria AD	27%	612	27%	617
ZAD Energy	48.08%	24,824	48.08%	24,702
POD Allianz Bulgaria AD	34%	7,133	34%	7,675
NECO	50%	4,494	50%	549
PKN Burgas-Aleksandrupolis*	50%	8	50%	8
Ecological exploitation of fuels and energy oils	69.90%	3	69.90%	3
		<u>153,401</u>		<u>165,565</u>
<i>Other investments</i>				
Company created under the Law for liabilities and contracts "St. Ivan Rilski"	50%	400	50%	400
Nabucco Gas Pipeline International	16.67%	248	16.67%	248
EI Bank	0.05%	43	0.045%	43
ZEUS Holding	4%	2	4%	2
		<u>693</u>		<u>693</u>
		<u>154,094</u>		<u>166,258</u>

* BEH divested its shares in 2010

Source: BEH Consolidated Financial Statement 2008

The complex structure of the new holding makes the task of efficient and transparent financial and operational management even more complicated. Without going in details on the latest developments in the big energy 'scandals' such as Belene and Toplofikacia, below will be outlined some of the major risks and challenges in the management of these state-owned companies. The list is far from comprehensive or detailed, but it will give a good picture of where some of the key 'intervention' points lie.

4.1.1. Public Procurement⁴⁴

As mentioned in Section II, the energy sector is one of the biggest 'clients' for public procurement. Both smaller and larger deals need to be revised as to: whether the procurement is needed, whether the proposed size

⁴⁴ Section is taken from *Corruption in Public Procurement: Risks and Reform Policies*, Center for the Study of Democracy, 2007.

and scope is realistic, what are the bid procedures, who are the bidders and who the winners. Section II explained in detail the main corruption risks and how they can be mitigated. The degree of possible damage to the budget and the tax-payer could be seen from the size of planned expenditures on purchase of land, machinery and facilities by BEH.

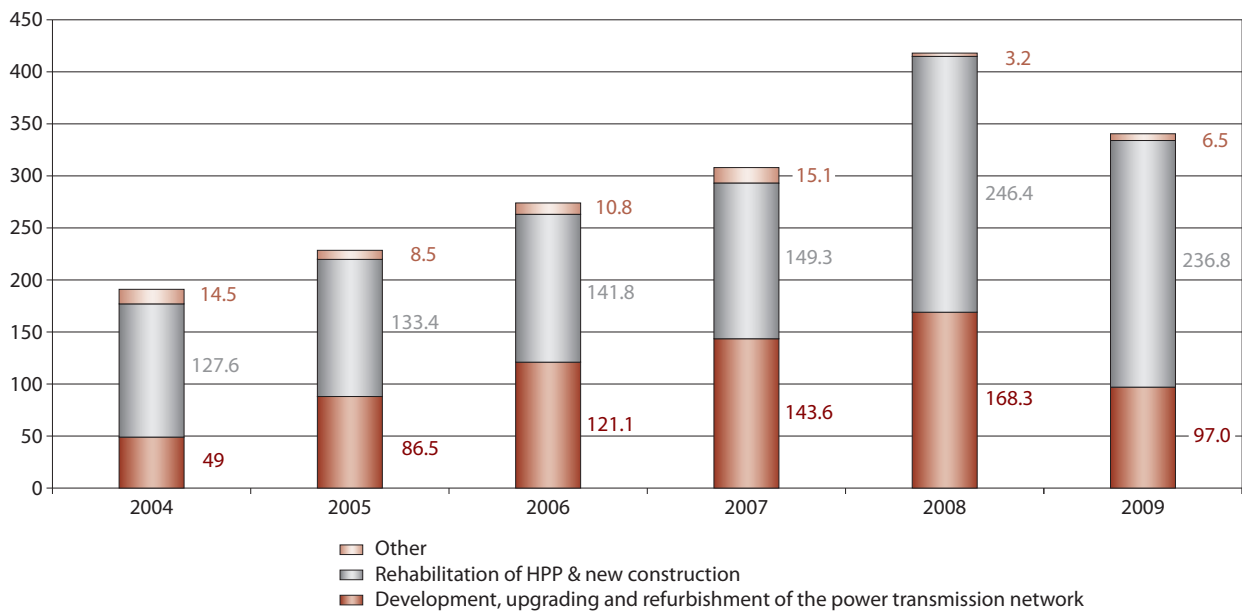
TABLE 19. PLANNED EXPENSES ON PP&E (THOUSANDS BGN)

Engagements for acquisition of property, plant and equipment (continuation)								
Investment project	2009	2010	2011	2012	2013	2014	2015	Total
Total for the group	402,434	575,727	309,914	125,121	12,000	12,000	10,000	1,447,196

Source: BEH Consolidated Financial Statement 2008

The available data points to a dramatic increase in investments in the past 2-3 years. Most of the investments seem to be in the area of hydro-power projects.

FIGURE 23. INVESTMENT ACTIVITIES OF NEC BY YEAR (MLN BGN)



Source: NEC Annual Report 2008, 2009

Also sizeable seem to be the sales of assets. Going through the respective sales bids and documents would probably reveal some interesting findings.

Box 8. BEH NET INCOME AND SALES

With the most significant profit from sales of real estate, machinery and equipment is the framework contract signed on 28 November 2007 with the contractor for the construction of NPP Belene. According to this contract the existing equipment found at the territory of the NPP Belene site, which will not be integrated in the project for construction of the new plant, will be bought by the contractor. In 2008 a sale of some of this equipment was completed. **The reported profit accounts for 844 thousand BGN (2007: 77814 thousand BGN).**

Source: BEH consolidated financial statement 2008

4.1.2. Financial Management and Transparency

With so many 'branches' of the holding 'tree', so many contracts signed by many different governments (often under vague conditions) and with so many technicalities of the sector, it would not be hard to manipulate or even unwillingly mistake financial data. Transfers of assets, provisions for all sorts of foreseen events, non-operational losses, consulting fees, etc – these are some of the many possible avenues for financial mismanagement and outright financial fraud. Currently we have not focused on detailed financial analysis but a thorough investigation would certainly reveal a lot of missing 'parts of the puzzle'. A specific example of how hard it would be to manage transparency in financial decision-making is the following abstract from BEH's consolidated 2008 statement, which explains that due to defects and inability to use some assets on the construction site of NPP Belene, those same **assets will be taken off the books**, with a marked loss of ~50 million BGN. Also sizeable share take the undefined category of 'Other' expenses.

Box 9. SCRAP OF MATERIAL ASSETS, REAL ESTATE, MACHINES AND EQUIPMENT

In 2008, an assessment was made of the technical condition of the assets found on the territory of NPP Belene. Part of the buildings, installations, separate construction elements and constructions are with considerable defects, other elements have also been assessed which will be dismantled due to the fact that they will not be used in the project for construction of NPP Belene, and have been scrapped. The balance amount of the scrapped assets found at the site of NPP Belene **amounts to 50,527 thousand BGN.**

Source: BEH consolidated financial statement 2008

TABLE 20. 'OTHER' EXPENSES SECTION, BEH 2008 CONSOLIDATED STATEMENT

Other expenses	2008	2007 (unaudited)
<i>In thousand BGN</i>		
Payments to the fund "Decommissioning of nuclear installations" and fund "Radioactive waste"	80,224	59,950
Free clothing and food	13,157	11,482
Expenses for fines and defaults	506	850
Depreciation of machines and equipment	1,145	-
Depreciation of financial instruments	326	-
Depreciation of material assets	142	10,142
Expenses for business trips	6,534	5,021
Expenses for training and qualification	1,308	1,075
Expenses for uncollected accounts receivables (sales)	419	109
Scrapped material assets, real estate, machinery and equipment	55,936	25,281
Expenses for one-time taxes	2,893	3,085
Expenses for local taxes and fees	4,618	4,389
Others	21,903	29,797
Total other expenses for the core activity	189,111	151,181
<i>Additional information by type of activity:</i>		
Activities related to electricity sale	169,156	140,638
Activities related to natural gas sale	9,454	1,448
Activities related to coal sale	9,358	8,024
Activities related to the group's administration	1,143	1,071
Total other expenses for the core activity	189,111	151,181

NEC's financial expenses also jump considerably in 2008 and almost double compared to 2007.

TABLE 21. NEC INCOME STATEMENT 2008, 2009

Income statement for the year ended 31 December 2009, in thousands of BGN							
Revenue	2009	2008	2007	Expenses	2009	2008	2007
Revenue from sales	2,754,548	2,912,988	2,340,363	Operating expenses	2,806,707	2,855,180	2,410,703
Other operating income	50,998	38,345	133,063	Net financial expenses	16,730	70,212	39,499
Income from dividends received from associated companies	24,634	20,896	18,255	Total expenses	2,823,437	2,925,392	2,450,202
				Profit before tax	6,743	46,837	41,479
Total revenue	2,830,180	2,972,229	2,491,681	Income tax expense	1,790	6,762	7,516
Loss		0	0	Net profit for the period	8,533	40,075	33,963

4.1.3. General 'Risk' Management

BEH operates in an industry that is quite dependent on source prices, currency fluctuations and simply the whim of foreign companies and oligarchs. A case in point is the recent 'gas' crisis. The Bulgarian government then claimed losses of 500 million BGN, while the final compensation requested from Gazprom were 20 million USD in direct damages and 80 million USD in opportunity costs. The crises revealed a number of flaws in the system such as the fact that the reserve storage facility could barely meet one-third of the needs and that there were no alternative transit routes. The overall moral of the story remains that with all the discussions around energy security and energy strategy, Bulgaria remains at high exposure and risk to Russian actions.

On a 'micro' level a more detailed analysis will show that there is high potential for not only mis-management of risk but also of 'corrupted' risk management. The Holding incurred losses of 75 million BGN due to exchange rate fluctuations. While this is a valid loss having in mind the large sales to Macedonia in USD, for example, it remains unclear whether the hedging strategy used is indeed the optimal.

TABLE 22. BEH LOSSES DUE TO EXCHANGE RATE 2008, 2007

	2008	2007
Loss from currency exchange rate, net (thousand BGN)	(75,725)	-

Source: BEH consolidated financial statement 2008

Box 10. BEH CURRENCY RISK***Currency exchange rate risk***

The group is exposed to currency exchange rate risk when buying, selling or procuring for investment projects, when the transaction is done in a currency different than the functioning currency. In order to manage the currency **exchange rate risk the exposition is hedged according to a received loan in Japanese yens.**

The group performs deals in Euro in relation to received technical and other services. These purchases are made in Euro. The exchange rate risk in these purchases, related to possible fluctuations in the currency exchange rate, is minimal because of the existing fixed exchange rate of Euro to BGN, set by the Bulgarian National Bank (BNB).

Source: BEH consolidated financial statement 2008

4.1.4. Risks Connected with the Trade of Green House Gas Emissions

Although the trade with such emissions is EU-regulated and therefore corruption risks should be limited, there is still need to keep related 'losses' and 'provisions' on the radar. For example, as we mentioned previously, we see in the 2008 BEH statement provisions for 'going over the allowed quotas for green house gas emissions' (related to the coal power plants) amounting to 38 million BGN.

An explanatory text in the notes to the 2008 consolidated statement describes the green house gas emission provisions. There is not enough public information to do deeper analysis of the used accounting and financial management practices in this case.

Box 11. PROVISIONS FOR EXCESS GREENHOUSE GAS EMISSIONS BEH***Provision for going over the quotas for greenhouse gas emissions***

For 2008, based on preliminary Plan for allocation of quotas for greenhouse gases (see also note 33 "Events after the date of the balance"), a shortage has been calculated for quotas for Enel Maritsa East 3 AD and TPP Maritsa East 2 EAD. Based on the market price of greenhouse gases, a provision has been estimated for going over the quotas for greenhouse gases.

The provision for going over the quotas for greenhouse gas emissions of Enel Maritsa East 3 AD has been issued as a result of an Agreement of NEC EAD for purchasing of electricity produced by Enel Maritsa East 3 AD. NEC EAD has the responsibility to compensate Enel Maritsa East 3 for any additional expenses it undergoes because of changes in the legal framework.

Source: BEH consolidated financial statement 2008

TABLE 23. PROVISIONS – BEH 2008

Provisions*In thousand BGN***2008****2007
(unaudited)****Long-term provisions**

Provisions for protecting the environment

1,169

1,326

Provisions for recultivation

35,940

29,012

Provision for going over the quotas for greenhouse gas emissions

-

-

37,10930,338**Short-term provisions**

Provisions for conserving the environment

979

485

Provisions for recultivation

1,611

1,611

Provision for going over the quotas for greenhouse gas emissions**38,585**

-

Constructive liabilities

306

-

Legal liabilities

320

-

41,8012,096**Total for the group****78,910****32,434***Source: BEH consolidated financial statement 2008***BOX 12. GREENHOUSE GAS EMISSIONS LIABILITIES BEH****Liabilities for the greenhouse gases**

With a letter from the European Commission the national plan for allocation of emission quotas, to which the big industrial installations have a right in the period 2008 – 2012, has been returned for reconsidering. In relation to that there is uncertainty regarding the exceeding of the allowed quantities of emissions of greenhouse gases by the operators of installations, which could bring a change in the allowed provision (see note 29).

Source: BEH consolidated financial statement 2008

The whole debate around the emissions trading – how it is going to affect energy companies, the price of electricity, etc is still a heated one and deserves a separate research and analysis. In this debate there are many vested interests (mainly from coal plants) since the new regulation will change the cost of produced electricity from the different sources dramatically.

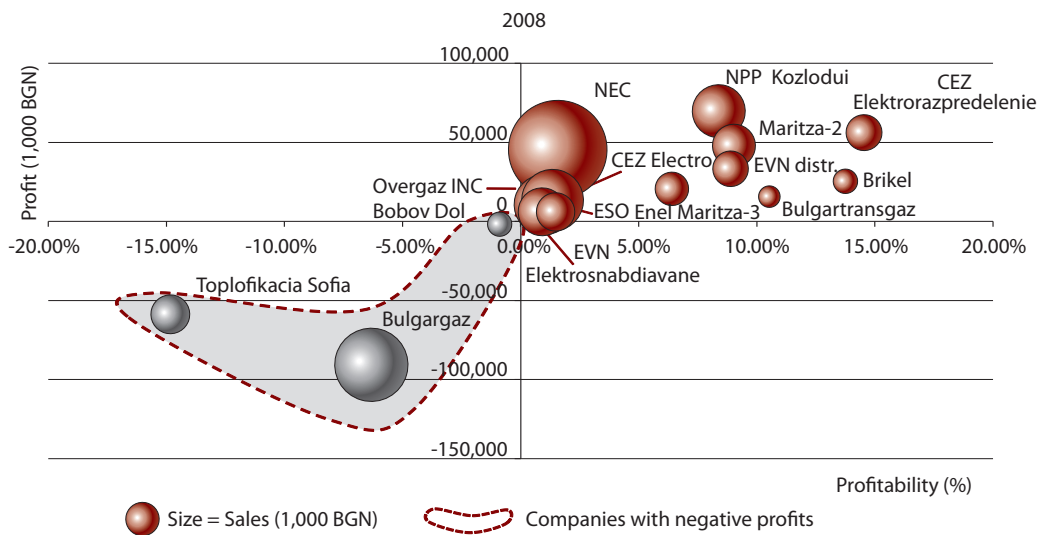
4.1.5. Export of Electricity

As mentioned in previous sections, there is a high risk of opportunity costs incurred due to limited participation of NEC in the export of electricity. The latest data is not available in order to assess what share of the trade market BEH has given up to private companies, but previous experience shows that the ‘unrealized’ profit could be quite large. What is needed is an efficient trading system that will bring transparency and ease of management, and will cut off speculations on the need and functions of intermediaries on the energy market.

4.1.6. The ‘Apex’ of all these Issues Remains: How BEH Manages its Operations and Profitability

The profitability of the Holding is a function of the profitability of all its subordinated companies. Although their profitability varies from company to company and from year to year, depending on cost of supplies, level of demand and price of sold energy and services, overall profitability is extremely low across the board. While NEC is the giant in sales, it is also one of the worst performers in terms of profitability. On the other hand private companies like Brikel have minute sales but mark comparatively high profits of ~ 14%.

FIGURE 24. 2008 SALES, PROFITS AND MARGINS



Source: Data sourced from Capital Weekly

Table 24 below also clearly drives the point home: NEC has an unacceptable profit level relative to its sales.

TABLE 24. NEC'S PROFITABILITY

	2009	2008	2007
Net Profit (after tax)	8,533	40,075	33,963
Sales	2,754,548	2,912,988	2,340,363
Profit margin %	0.3%	1.4%	1.5%

Source: NEC annual reports 2008, 2009

In the consolidated 2008 statement, there are already signals that the 2009 performance will be even worse due to unfavorable price and overall business conditions, decrease of demand, etc.

BOX 13. REALIZED LOSSES FROM TRADING ACTIVITIES – BEH

Realized losses from trade activities

NEC EAD and ESO EAD are performing their activities during 2009 in the environment of unfavorable price and business conditions. We are witnessing decrease in electricity consumption in the country, worsening of the export trade with decrease in the demand and decrease in the market prices. At the same time, with a decision of the State Commission for Electricity and Water Regulation, there was an increase in preferential prices of electricity produced by combined methods in power plants that use natural gas, starting from 01.01.2009; there was also an increase in preferential prices of electricity produced by renewable sources of energy and hydro power plants with installed capacity of up to 10 MW, starting from 01.04.2009. That led to realization of losses for NEC EAD amounting to 42 mln BGN for the period of the first six months of 2009.

In ESO EAD there was a rise in expenses for purchase of availability of cold reserve as a result of the decrease in consumption of electricity and the stopping of units in some of the condensation plants. As a result ESO EAD realised a loss amounting to 37 mln BGN for the period of the first six months of 2009.

Mines Maritsa East EAD has realised a loss amounting to 19 316 thousand BGN. The decrease in consumption in the country and the region resulted in decrease in orders for the company in the first half of 2009. As a result and because of stagnant coal prices sales revenue has considerably decreased, which led to a realised loss during the first half of 2009.

Source: BEH consolidated financial statement 2009

The profitability of an energy company, due to the complexities of the sector, explained above, is harder to manage. However, there are certainly avenues that could and should be pursued in order to improve overall performance. A non-exhaustive list would include:

- Losses along electricity production and distribution process: due to facilities mismanagement and stealing;
- Lack of lean operations;
- HR costs – in the table below we see that salaries expenses have increased dramatically in the last 1 year. Special cases are the NPP projects where security concerns would prevent any HR optimization projects;

TABLE 25. PERSONNEL EXPENSES OF BEH

Personnel expenses*In thousand BGN*

	2008	2007 (unaudited)
Salaries and bonuses	346,568	284,344
Pension and healthcare contribution	139,275	99,325
Change in surcharges for annual paid leave that was not used and for social security over the obligation for unused annual paid leave	14,117	14,611
Change in the liabilities for pension compensations	15,386	10,189
Social expenses	63,869	74,409
Total personnel expenses	579,215	482,878
<i>Additional information by type of activity:</i>		
Activities related to sale of electricity	453,028	369,314
Activities related to sale of natural gas	28,734	25,906
Activities related to sale of coal	94,398	85,591
Activities related to administration of the group	3,055	2,067
Total personnel expenses	579,215	482,878

The average number of the personnel for 2008 is 22 223 people (2007: 22 256)

Source: BEH Consolidated Financial Statement 2008

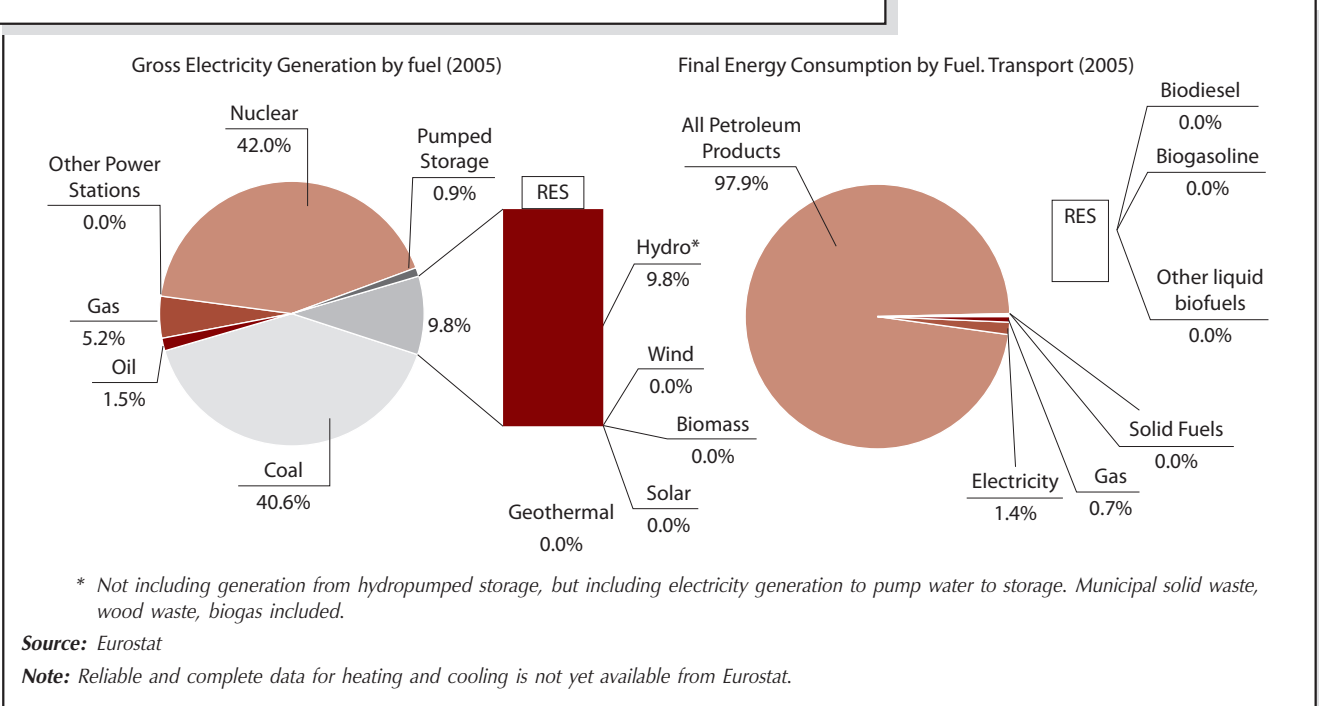
- Administration of the Holding and sub-companies;
- Divesting of losing parts of the holding/going public – There have already been considerations of restructuring BEH to allow IPO and privatization moves. However a very careful due diligence should be made as to whether this would be the right financial and managerial decision as well as to what precise parts of the holding to offer publicly or divest;
- Overall leaning/‘cutting the fat’ out – that includes a variety of solutions from better asset management/divestment, through network optimization, HR optimization, going digital, etc.;

- Improving successful collection rate – possible hiring of private collection agencies, etc.;
- Improving the use of IT in overall operations – CRM systems, electronic data collection, etc.

4.2. MANAGING THE ‘GREEN’

The sustainability issue has been discussed widely in the press and the public. The growth in interest in RES projects the last few years has been dramatic – mainly wind and hydro projects although the RES share is still low.

FIGURE 25. GROSS GENERATION AND FINAL CONSUMPTION BY FUEL (2005)



The decision to how ‘green’ we should go is influenced strongly by a number of conflicting pressures: EU directives, strong coal and nuclear lobbies, concern for energy poverty, etc.

The inclusion of RES producers to the network raises a large number of administrative, managerial, financial and corruption questions, among which:

- Unpredictability of RES – wind and sun, less so water, could not be precisely predicted and managed as sources of energy;
- Quality of the resource (ups and downs of wind and sun light) which lead to wavering of the current in the network;
- Inability to store produced energy;
- Lack of supply/demand balance – wind is strongest at night while consumer demand drops drastically then;

Box 14. 'GREEN INVESTORS' INTEREST

By the end of 2008 in NEC have been filed requests for addition to the electricity distribution grid of wind energy parks with total installed capacity of 7690 MW and photovoltaic parks with total installed capacity of 440 MW. Preliminary contracts for addition to the grid have been signed with 16 investors with total installed capacity of 1112 MW (of which 965 MW are wind plants and 147 MW are photovoltaic parks).

Source: NEC Annual Report 2008

- Inability to produce energy all the time;
- Production costs are still very high; fixed purchase prices are much higher than fixed sale price to final consumers;
- Large investments to get 'green' producers on the grid – currently not shared by RES producers;
- Potential speculative money in those investments;
- Potential abuse of structural funds;
- Corruption of the environmental impact assessment process.

In an attempt to control these challenges the regulating body started discussing a 20% cap of 'green' production from total capacities. This however, is not a sustainable solution and does not seem to be based on any thorough cost-benefit analysis. What is needed is a more precise prediction mechanism for the RES potential as well as better management of loads and peaks.

The main pillar of the 'anti-green' lobby argumentation remains the cost of green energy. Although it is true that currently RES are not as cheap as coal and nuclear, this is bound to change due to a number of factors:

- 1. RES technologies are improving rapidly** and there are in R&D phase a number of solutions that in 2-3 years will be cost competitive with traditional fossil-based producers. Cases in point are the upcoming CSP (Concentrated Solar Power) solutions that are times cheaper than PV (Photo Voltaic) installations both in up-front investment but also in the generation itself. PV technologies themselves are being improved to generate much cheaper electricity. Here comes the question, when solar projects are being approved in Bulgaria – do consultants and investors factor in those technological advances, or do they simply go after available EU funds and profitable long-term power purchase agreements?
- 2. Coal and nuclear are not as cheap as we are made to believe**
Millions and millions are poured worldwide from the traditional energy lobbies into the pockets of policy makers and media to create the illusion that 'green' energy can never be as cheap and functional as coal and nuclear. The introduction of the green house gas markets will change that for good.

Even the untrained eye will easily spot a number of issues:

1. If added the CO₂ cost will drastically change the balance between traditional and RES producers in terms of price
2. Coal and natural gas have very high price sensitivity and import de-

TABLE 26. KEY INDICATORS BY SOURCE

Energy resource	Cost 2005 (EURO/MWh)	Cost 2030 (EURO/MWh, CO ₂ =20-30 EURO/ton)	Emissions (kg CO ₂ /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	64 yrs
Oil	70-80	80-95	550	82%	93%	30%	Very High	42 yrs
Coal	30-50	45-70	750-800	39%	59%	40-48%	Medium	155 yrs
Nuclear fuel	40-45	40-45	15	100% uranium ore		33%	Low	85 yrs
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: 2020 Bulgarian Energy Strategy (draft 2008)

pendence – which decomposes another myth – that of energy ‘security’. In a world of diminishing resources, dependence on fuel imports could not be a wise decision in terms of security.

3. RES are much more efficient than traditional power plants
4. Endless reserves of renewables – that is obvious but often forgotten as an argument

These factors are key when policies are made regarding:

- Consumption prices;
- Long-term energy strategy;
- Large-scale investments in nuclear and coal.

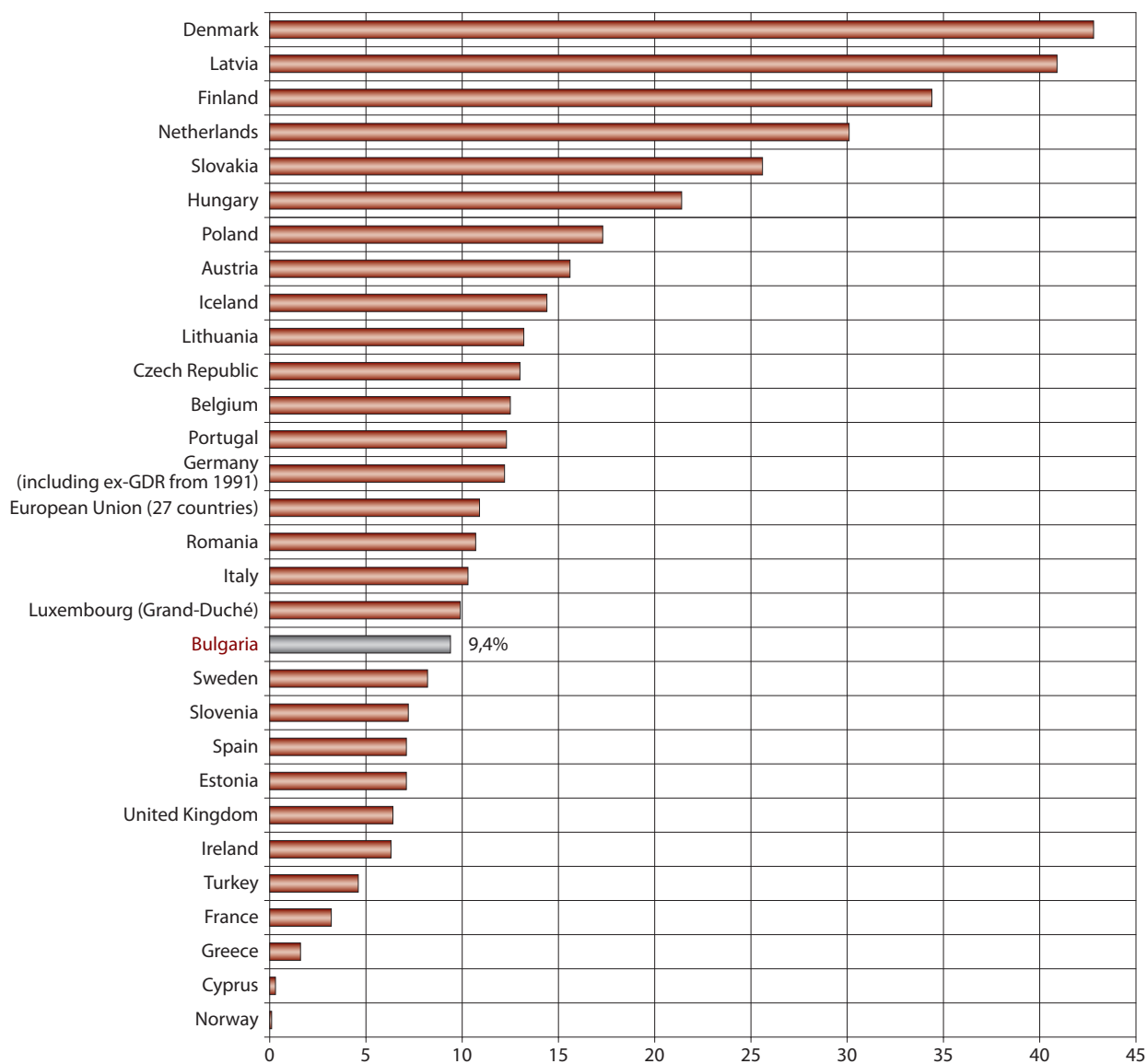
Therefore putting a cap to ‘green’ production cannot be an informed decision. A careful cost-benefit analysis of the overall energy mix as well as the individual investment project is the only correct route.

Another major shortfall of Bulgaria is the low share of **combined heat and power generation**. Bulgaria should further utilize the technology in order to reduce emissions and increase energy efficiency.

Some possible ways to address the challenges of adding more ‘green’ capacity are outlined below:

- Laws that oblige NEC to add new RES to the grid in a speedy and efficient manner. Currently NEC is dis-incentivized to add new ‘green’ capacities because of taking the full associated cost and technical burden;
- RES producers and consumers to have their share of ‘green’ cost. Share contributed to ‘green’ energy can be printed on consumer in-

FIGURE 26. COMBINED HEAT POWER GENERATION (CHP) – % OF GROSS ELECTRICITY GENERATION (2007)



Source: Eurostat, Combined Heat and Power Production (CHP) in the EU, 2001 (SAVE Programme)

- voices in order to increase transparency;
- RES producers to join the international trade with 'green certificates';
- A balance to be sought between giving 'green' investors guarantees and lowering the burden to NEC of long-term purchase price agreements
- CHP capacity to be increased;
- The newest and most efficient RES technologies to be reviewed before approving projects.

4.3. LIBERALIZING MARKETS: ELECTRICITY AND GAS

Since July 2007 Bulgaria has formally liberalized its electricity markets. In theory that should allow all consumers to choose their supplier company as well as have access to the electricity network itself in accordance with the Electricity Directive of the EU. However, in practice, the markets are only partially liberalized – consumers are not yet able to choose providers.

Although there is some increase in players and activity on the liberalized market, its share is still not sufficient to create competitive and balanced market conditions.

TABLE 27. PURCHASED ELECTRICITY ON REGULATED AND ON FREELY-NEGOTIATED PRICE (GWh; %)

Purchased electricity at regulated prices

Contracting party	2009		2008	
	Amount of electricity purchased, GWh	Relative share of total amount, %	Amount of electricity purchased, GWh	Relative share of total amount, %
NPP and TPP	20,068	82.03	21,672	68.93
District Heating Plants	1,699	6.95	1,646	5.24
Autoproducers	2,133	8.72	2,078	6.61
Renewables-based plants:				
– hydropower	439	2.02	330	1.05
– wind	69	0.28	48	0.15
Total	24,462	100	25,774	81.98

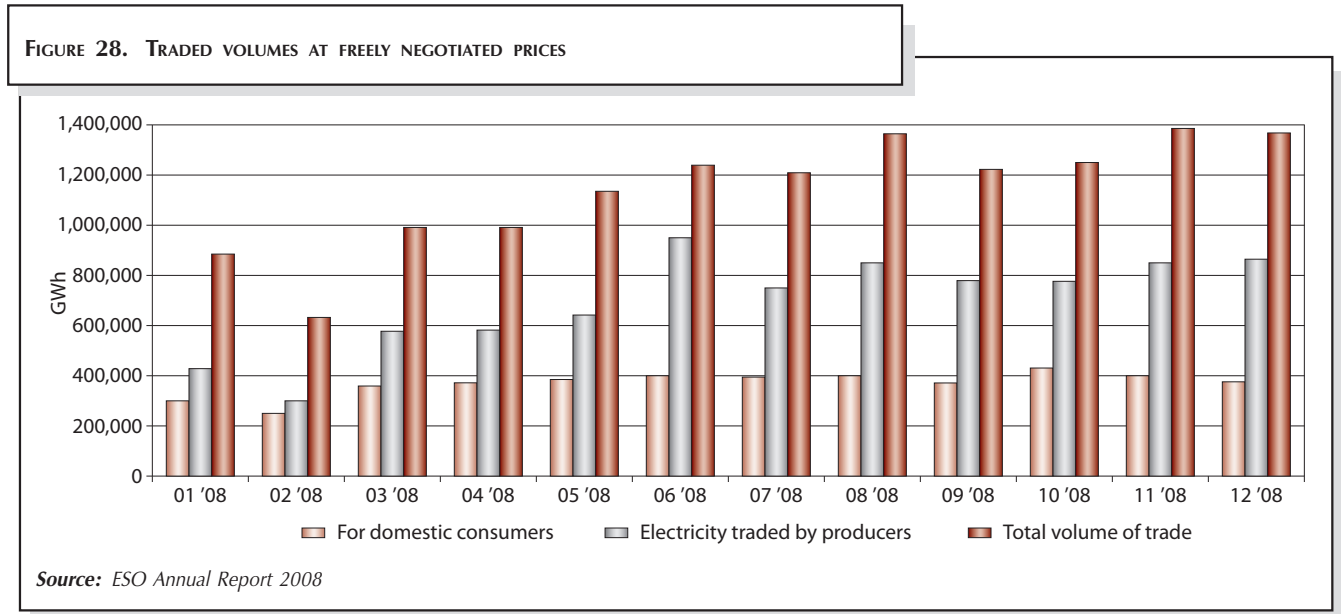
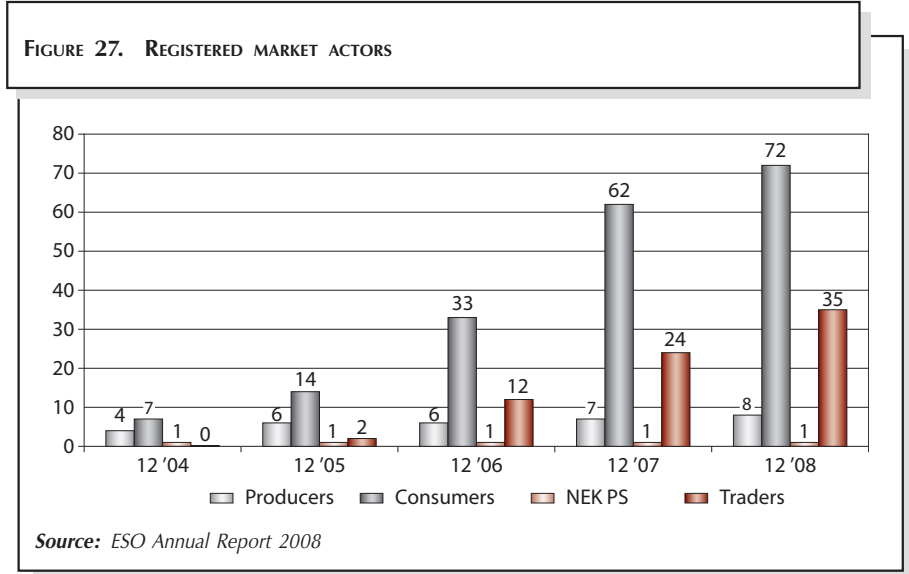
Purchased electricity at non-regulated prices

	2009		2008	
	Amount of electricity purchased, GWh	Relative share of total amount, %	Amount of electricity purchased, GWh	Relative share of total amount, %
Internal market			4,858	15.45
Import for re-export			808	2.57
Total			5,666	18.02

Source: NEC Annual Report 2008, 2009

Also since July 2007 the regulator set quotas to the producers that aim at covering the need for electricity of all 'protected customers'. Such protected customers are all households and businesses with up to 50 employees and annual turnover of 19.5 million BGN.

The current model is transitional and will be transformed after finalizing the new Rules for trade of electricity, under development by ESO. Some



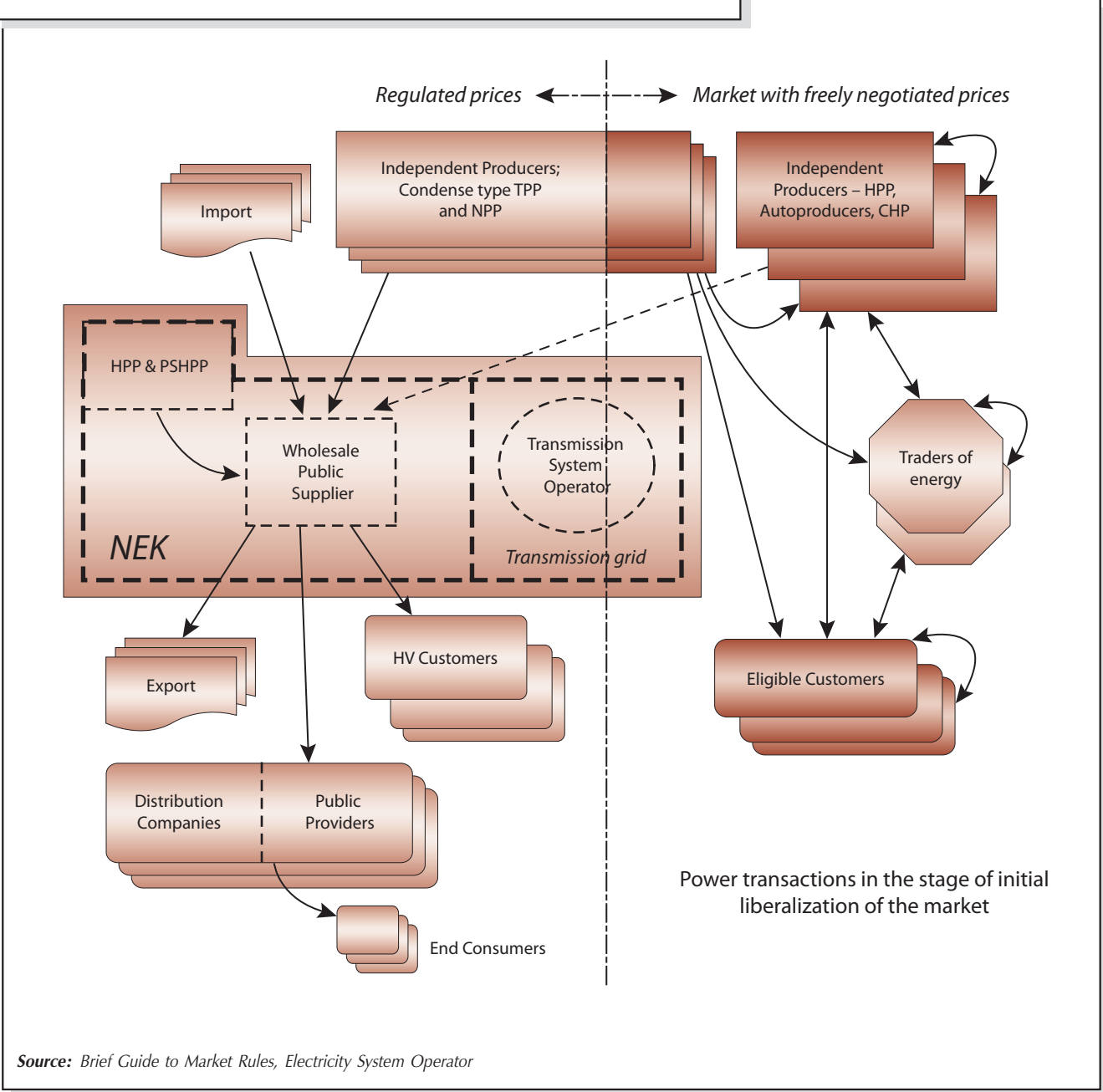
of the main issues under consideration for the new rules are the definition of the ‘balancing groups’ as well as the potential development of a future trade exchange mechanism. Under review is also whether Bulgaria should have its own energy exchange or it should join a regional one.

In any case the development and creation of the trade platform should be done in a **transparent** and **cost-efficient manner**. The platform should allow NEC to have higher participation in energy export and it should also allow gathering of data for the needs of the government analytics.

Some key shortfalls of the current market could be summarized:

- All prices along the generation-supply axis are still **regulated**;
- Trading with energy is not done in a **transparent and financially responsible manner**;
- **Long-term contracts** are signed to limit energy quantities and the number of players on the liberalized domestic electricity market;

FIGURE 29. LIBERALIZED MARKET STRUCTURE



Source: Brief Guide to Market Rules, Electricity System Operator

- **Mandatory purchase and non-market prices** (this concerns mainly RES and co-generation) limit the development opportunities of a truly competitive energy market;
- There is still **no exchange-type market** despite the favorable pre-conditions set up in 2003.

The gas market is in an even earlier stage of development. Bulgaria is seriously lagging behind not only EC-27 but also behind its neighbors in developing its gas networks and household gasification. The short statistics below⁴⁵ show the huge gap between Bulgaria and the EU:

⁴⁵ Gas market – liberalization and functioning, Ministry of Economy, Energy and Tourism.

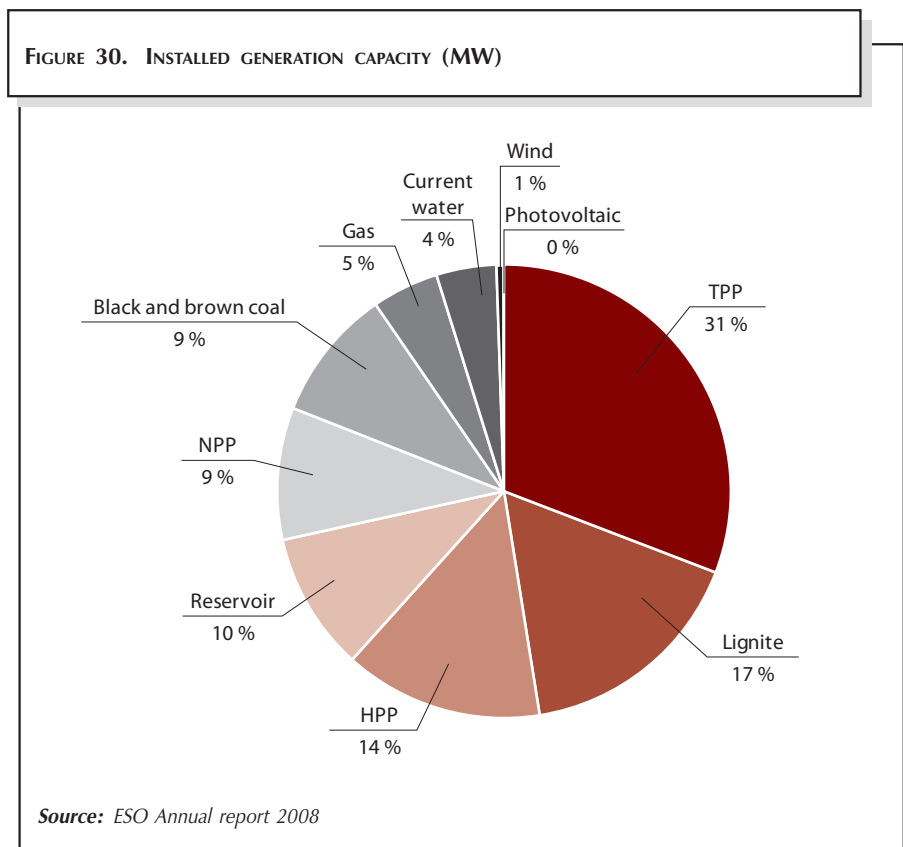
Share of municipalities on whose territory gas distribution is performed: BG=15%, EU>80%

Share of municipalities which are licensed to distribute gas or are in the process of acquiring such license (in 2/3 of them there is no actual gasification): BG=49.5% (as of 2005), EU=90%

Share of gasified households: BG<1% (~30 000 households), Romania=2million households, The Netherlands=92%, Slovakia=90%, UK=82%(2005), France=76%, Hungary=75%, CZ=66%, Poland=52%

Serious steps need to be taken in order to bridge that gap. Although increasing gasification is one of the priorities in the 2020 strategy, serious political and financial support will be needed in order to deliver gas to the majority of Bulgarian households.

4.4. THE 2020 STRATEGY REVISITED

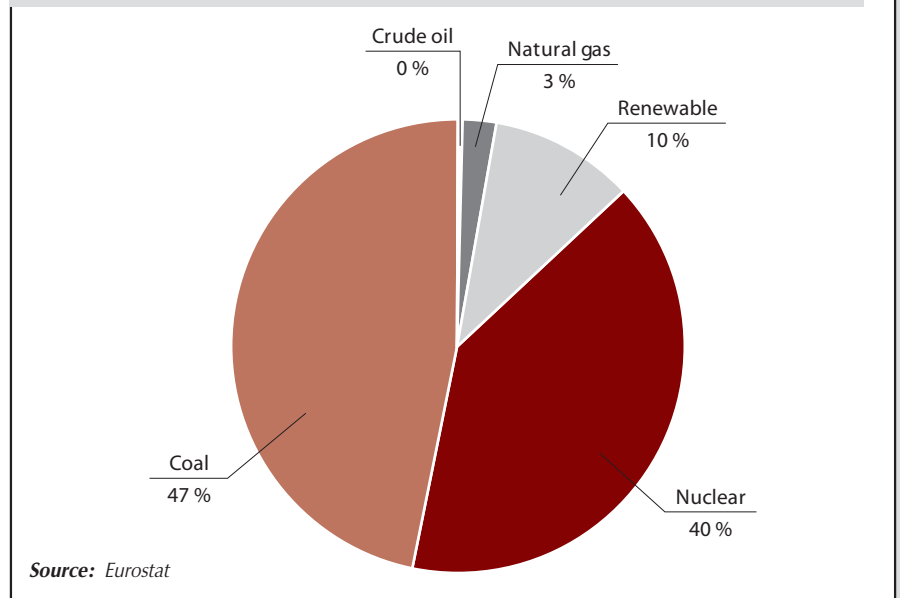


The 2008 version of the Bulgarian Energy Strategy is largely mirroring the EU strategic documents – their 2020 targets, their priorities and the means to achieve these priorities. It is a very informative and comprehensive document of ~80 pages that introduces the main goals and the main challenges of the industry. Below are outlined some of the key issues that can be considered as either flaws of the strategy or potential ‘risk’ areas for allowing special interests to influence policy-making.

One general remark is that the strategy overall is heavily influenced by the strong coal and nuclear lobbies in the country. While renewables and energy efficiency are put forward as prime strategic goals, the energy mix of the country will remain

heavily unbalanced in the direction of coal and nuclear. The figures below show the current energy mix.

FIGURE 31. PRIMARY ENERGY PRODUCTION BY SOURCE (2007)



General flaws of the strategy:⁴⁶

- There are no provisions for **revising the strategy** in relation to the actual achievement of the goals and the changing macro-economic and geopolitical situation. There should be specifically defined periods for such revisions;
- The strategy does not take into account the **dynamics of the changing markets** in EU – Section I already discussed the shrinking Balkan export market as an example;
- The strategy does not take into account the **technology development curve in RES** – very soon RES will be price competitive to traditional sources due to improved RES technologies as well as the development of the Emissions Trading Scheme (ETS) in Europe;
- The strategy clearly states that **coal** will remain the pillar of Bulgarian energy industry and that the country is willing to spend even more on coal plants through introducing ‘state of the art technologies’. This leaves room for even further expansion of the coal industry and new huge expenses such as the planned **Carbon Capture and Storage System (CCS)**. Bulgaria has stated its willingness to make a demonstration project in ‘Mariza Iztok’, which would be part of the EU program of building 10-12 pilot plants with CCS by 2015.⁴⁷ Such CCS project would mean accessing huge subsidies from the EC – would that be yet another avenue for huge corruption schemes? Analysts from Bellona share that: ‘It is already rumored that certain interest groups would use the CCS as an instrument to decrease CO₂ emissions by increasing subsidy frauds.’ Not only EU funds are at risk, the 2020 strategy in itself allows for the use of local funds for the CCS project (page 59):

⁴⁶ Largely based on the declaration of opinion of the participants of the National conference *Energy strategy of Bulgaria – analysis and recommendations*, February 2009.

⁴⁷ http://www.bellona.org/articles/articles_2009/1247472841.24

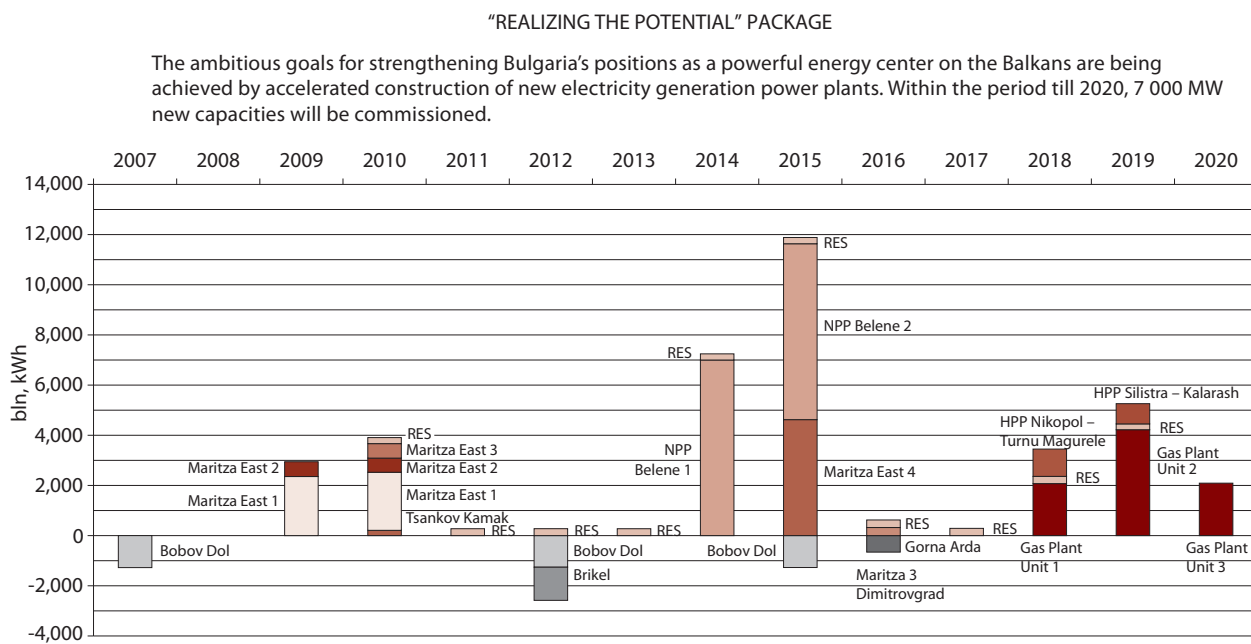
Box 15. 2020 STRATEGY – 2008 DRAFT

Use of at least 60% of the national revenues from emissions trade and the new liberal regime related to state aid in the environmental field to encourage the introduction of innovative, high-efficiency and clean generation technologies, including carbon capture and storage technologies.

The government should therefore:

- Base the decision on whether to pursue the CCS plan on a careful cost-benefit analysis.
- Make sure that there is a clear mechanism for financial monitoring and corruption prevention.
- The strategy has a **top-down approach** – instead it should allow for decentralization and the introduction of energy efficient solutions bottom-up – from households and small energy independent communities;
- The strategy should push even more for adopting in reality **the national allocation plans for emission quotas** related to Bulgaria’s participation in the **ETS system**;
- The strategy also relies heavily on the increase of nuclear capacity. There are two problems with this:
 - The risk of not going through with the NPP Belene project which will multiply by zero all current calculations in the strategy.
 - Not factoring in the social, environmental and fiscal costs of nuclear storage. The nuclear lobby clearly tries to avoid the issue, but a truly ‘independent’ document such as a national strategy should highlight this long-term burden.

FIGURE 32. CAPACITY BUILDING PLANS BY 2020



Source: Bulgarian Energy Strategy 2020 (2008 draft)

- In view of the dynamically changing market environment and risks related to the completion vs. non-completion of huge energy projects such as Nabucco, South Stream and Belene NPP, the strategy should include **more than one projected scenarios**. The model on which calculations are based should be revised and more than one scenarios should be given, with adjusted action plans in accordance;
- There are no clear mechanisms outlined in the strategy as to how funding (internal and external) will be **managed efficiently and transparently**. Previous sections showed that there are huge mis-management and fraud risks in the sector. Special provisions should be made in the strategy to counter this risk;
- The strategy should also highlight more the need to support **scientific research and development**;
- The need of a modern **system for communication and automatization** of the energy transmission network should be clearly stated. Such modern system is key for the 'unlocking' of the market for small RES producers;
- Provisions should be made for **further analysis** such as:
 - Impact assessment;
 - Macroeconomic impact of the strategy;
 - Ecological assessment;
 - Social assessment;
 - Cost-benefit analysis;
 - Assessment of RES utilization potential;
 - Assessment of the true energy efficiency capacity of the country.
- Provisions for the optimization of the process of **energy planning** and a wide **public debate** on the set priorities should be made;
- There should be provisions for financial incentives for using **'green' transportation**;
- Clear note should be made on **NOT defining** the energy produced by **burning household waste as 'clean'**. There are high environmental risk connected with this technology.









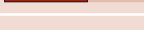




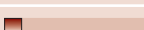
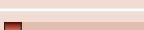
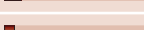



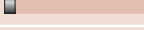
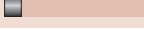




4.5. REDUCTION OF GREENHOUSE GAS EMISSIONS

When setting national targets the Commission uses an approach that takes into account the GDP level per capita in the respective Member State, the progress achieved and the economic growth forecasts. It is not surprising that in the process of negotiating these targets Bulgaria joined a group of ~8 countries⁴⁸ (mainly SEE) that lobbied for higher emission caps relying on their low income levels. As a result for Bulgarian sectors not covered by the ETS, **an increase of 20 % over 2007** levels was proposed for emissions by 2020, which is the **highest in EU** (Member states are given targets that range from -20% to +20%). This is most likely also the result of the efforts of the local 'coal' lobby which is the biggest air polluter in the energy sector. On a macro level, Bulgaria is given a high emissions cap also within the Kyoto protocol.

⁴⁸ Interview with Za Zemiata, August 5, 2009.

Existing data shows that Bulgaria is doing well in terms of the 2012 Kyoto target.

TABLE 28. KYOTO TARGETS

EU member state	2003	2004	2005	2006	2007	Kyoto target 2012	% Under Kyoto target
Latvia	10.7	10.7	10.9	11.7	12.1	23.3	 48.07 %
Estonia	21.2	21.2	20.7	19.2	22.0	40.0	 45.00 %
Lithuania	16.7	21.1	22.6	22.8	24.7	44.1	 43.99 %
Romania	no data	160.1	153.7	153.9	152.3	259.9	 41.40 %
Bulgaria	no data	68.9	69.8	71.5	75.7	127.3	 40.53 %
Hungary	83.3	79.5	80.5	78.8	75.9	114.9	 33.94 %
Slovakia	51.1	49.5	48.7	49.0	47.0	67.2	 30.06 %
Poland	382.5	396.7	399.0	399.3	398.9	551.7	 27.70 %
Czech Republic	147.5	147.1	145.6	149.1	150.8	180.6	 16.50 %
Sweden	70.9	69.7	67.0	66.9	65.4	75.2	 13.03 %
United Kingdom	658.0	660.4	657.4	647.9	636.7	678.3	 6.13 %
France	560.9	556.1	553.4	541.7	531.1	564.0	 5.83 %
Greece	137.2	137.6	139.2	128.1	131.9	139.6	 5.52 %
Belgium	147.6	147.6	143.8	136.6	131.3	135.9	 3.38 %
Germany	1024.4	1025.0	1001.5	980.0	956.1	972.9	 1.73 %
% Over Kyoto target							
Netherlands	215.4	218.4	212.1	208.5	207.5	200.4	 -3.54 %
Portugal	83.7	84.6	85.5	84.7	81.8	77.4	 -5.68 %
Ireland	68.4	68.6	69.9	69.7	69.2	63.0	 -9.84 %
Finland	85.4	81.2	69.3	79.9	78.3	71.1	 -10.13 %
Slovenia	19.7	19.9	20.3	20.5	20.7	18.6	 -11.29 %
Italy	577.3	580.5	582.2	563.0	552.8	485.7	 -13.82 %
Denmark	73.6	68.2	63.9	71.0	66.6	54.8	 -21.53 %
Austria	92.5	91.2	93.3	91.6	88.0	68.7	 -28.09 %
Spain	407.4	425.2	440.6	433.0	442.3	331.6	 -33.38 %
Luxembourg	11.3	12.8	12.7	13.3	12.9	9.1	 -41.76 %

Source: Europe's Energy Portal (www.energy.eu)

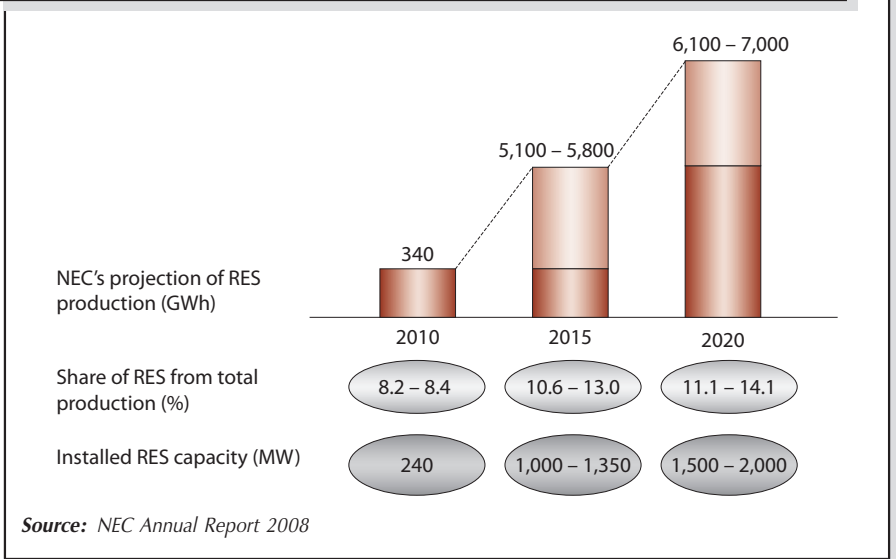
However, there are already signs that Bulgaria would not remain one of the air polluting havens in Europe for much longer. Changes proposed by the Commission in the ETS will force Bulgarian coal-fuel plants from 2013 to purchase/pay the allowances for all the emissions emitted. This invariably will change the balance between production cost for traditional energy producers and RES.

4.6. INCREASING OF RES SHARE IN GROSS FINAL CONSUMPTION OF ENERGY

The target set for 2020 for Bulgaria is 16% of final consumption to be from RES. Bulgaria, again, is expected to provide among **the lowest additional increase (7.1%) as compared to other Member States.**

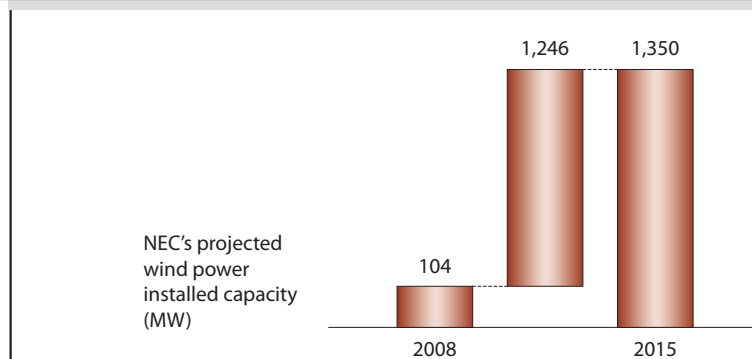
As seen from the figures below, based on NEC’s 2008 annual report, Bulgaria has ambitious plans when it comes to RES – mainly hydro and wind projects. However, it is unclear what part of this projected increase will actually materialize.

FIGURE 33. NEC’S PROJECTIONS FOR RES INCREASE



The key issues for the government are the creation of a balanced mix of sources within RES over time. Large hydro and wind projects are much more harmful to the environment than localized solutions that allow **energy ‘independent’ local communities** that rely on small solar, wind and hydro projects. At the moment the existing legal and physical infrastructure does not allow for such energy independent communities to be formed. Such communities are very common and successful in countries like Denmark and the Netherlands.

FIGURE 34. NEC'S PROJECTIONS FOR WIND CAPACITIES INCREASE



Source: NEC Annual Report 2008

4.7. ENERGY EFFICIENCY IMPROVEMENT

Since Bulgaria is consistently the least performing country in Europe in terms of energy intensity, its 2020 targets are correspondingly more ambitious – a 50% decrease by 2020 compared to the 20% of other EU members.

The biggest potential for reduction comes from the process of energy generation and distribution itself, including: the development of the gas distribution network, reducing transmission and distribution losses, improving the efficiency of thermal power plants, increasing the share of energy generated from high-efficiency co-generation.

4.8. IMPORTANT ENERGY INVESTMENT PROJECTS

The huge ongoing and planned investment projects have been a constant topic of debate in the media and within policy circles. So far it has been clear that the guiding principle in decision making has not been sound economic analysis but rather accommodation of the strongest political and financial interests within the country and abroad (mainly Russia).

Some of the key projects are:

- **NPP Belene;**
- Second electrical/energy connection with Greece: **Galabovo – Nea Santa;**
- **Bourgas-Alexandroupolis** oil pipeline;
- **Regional terminal for Liquid Natural Gas (LNG)** – either at the Bulgarian Black Sea or at the Greek coastline;
- **AMBO** – project for petrol transmission line from the Caspian region: Bourgas-Skopie-Vlora(Albania);

- **Nabucco** – gas pipeline from the Caspian region, through Bulgaria and Turkey, to the Western countries;
- **South Stream** – gas pipeline to connect Russia with Italy and Austria, bypassing Ukraine;
- **Rehabilitation** of existing capacities – mainly coal plants in ‘Maritza Iztok’;
- **Large Hydro project ‘Tsankov Kamak’;**
- **Large wind projects** – such as those planned near Kavarna, Shabla and Balchik.

It would not be efficient for this report to go into detailed cost-benefit analysis of these projects. First, there have already been many discussions in the public space and much of the pro’s and con’s have already been outlined. What is more, all necessary data are not available at the moment to do an independent cost-benefit analysis. Finally, projects like Nabucco and South Stream will eventually be economics-based decisions of stakeholders outside Bulgaria. Therefore what is more beneficial to do is to outline the **key considerations and analysis that should govern policy makers** when deciding upon and implementing large infrastructural projects:

- **Solid financial analysis**
 - Thorough analysis of all financials of the project. For ongoing projects, independent audit of previous expenditures should be performed;
 - Sensitivity analysis that builds alternative scenarios based on pre-defined indicators such as: cost of fuel, demand fluctuations, export conditions, etc.;
 - Analysis of the Balkan region energy market (part of the sensitivity analysis) – new capacities, planned regulations, demand trends, etc.;
 - Time sensitivity analysis – how much it will cost, including opportunity cost, to build it in 3 years, in 5 years, etc.;
 - Analysis of ‘cost of NOT building it’ – opportunity costs, security costs, etc.
- **Specific key areas of economic analysis:**
 - Economic and political assumptions on which initial investment plans are made – market demand, regulations, etc.;
 - Detailed break-down of cost per MWh – including waste management cost, CO2 emission trading, share of cost to get on the grid (for RES especially);
 - Inflation projections;
 - Effects of the financial crisis;
 - Increasing cost of HR;
 - Increasing cost of capital;
 - Currency risks;
 - Increasing building/construction costs – materials, security regulations, etc.
- **Fraud analysis**
 - What damage has been done so far – existing fraud cases;
 - What are the potential risk areas – EU subsidies, Public Procurement, etc.;
 - Revision of Public Procurement plans – procedures, items to organize bids for, criteria set for the bids, etc (see Public Procurement section of the document);

- **Revision of current management mechanisms and key management figures**
 - Is the current management structure optimal?
 - Where is power concentrated – is this optimal in terms of efficient and timely decision making; is it free of corruption?
 - Who are the key figures – their clean corruption record, their capacities, their vision for the development of the project?
 - Ways to optimize operation and management.
- **Environmental Impact analysis**
 - Long-term waste management;
 - Biodiversity;
 - Environmental Impact Assessments – currently they are not 100% transparent and independent, as they are performed by experts, paid by the investor, which produces conflict of interests;
 - Assessment for compliance with 'Natura 2000' – currently investors choose their experts, again – conflict of interests.
- **Social Impact analysis**
 - Effect on energy poverty;
 - Effect on local employment.
- **Strategic position and importance of the investment**
 - How it 'sits' in the overall revised energy strategy (see comments on current strategy above)?
 - How realistic is the project's relevance to security – e.g. dependence on Russia for nuclear fuel vs. inexhaustible RES?
- **Legal analysis**
 - Revision of all key contracts;
 - What would be the penalty payments if the government decides to freeze or permanently block the project?
 - Ability to amend current contracts with more favorable conditions.

These are some of the key analytical steps that should go into an informed-decision making. As governments are usually stretched thin of resources and time, in the next section we propose some practical steps and solutions to tackle not only large investment projects but the energy sector overall.

