DIAGNOSIS ANALYSIS OF THE EXISTING SITUATION OF C.E. HUNEDOARA (*PART I)*

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1. Necessity and opportunity of the restructuration of the company CEH

The Company Complexul Energetic Hunedoara was established as a result of the merger of SC Electrocentrale Deva and SC Electrocentrale Paroşeni,four hard coal mines: EM Lonea, EM Livezeni, EM Vulcan ,EM Lupeni,the Coal preparation Valea Jiului and Mining Rescue Station.

The objective of CEH was to increase the efficiency, in the context of the energy market at that time, of both hard coal operation activity in Valea Jiului and the activity of producing electricity and heat based on hard coal, of the two existing plants in the area (Paroseni TPP and Deva TPP).

The further developments in the electricity market and the lack of financial resources needed for the investment programs, which should have been made especially in the mining field to reduce the coal extraction costs, led to deterioration of the financial situation of the company, the current net debt of it at the end of 2014 reaching to about 462.7 million lei. The same year, CEH recorded a loss of 352.3 million lei.

Analysing the economic situation of CEH,indicate the necessity to issue adequate measures for restructuring and reorganization of the company,to allow its recovery in the context of an unfavourable energy market for the producers of energy based on coal.

2. The analysis of CEH operation on the energy market

The power plants belonging to CEH had on 1st of January 2015, an installed power of 1225 MW and 1063 MW net power, through networks of 220kVand 400 kV,situated into the middle of the Banat area installed hydropower plants of about 3143Mw,2788 Mw net.Considering that the total electricity consumption of Banat area in 2012 was 1220 MW on peak load, and 515 MW at low load, we could say that this area has an excess power

On the other hand, in this area, only power plants belonging to CE Hunedoara can be operated without constrains connected to the meteorological conditions. So, **CE Hunedoara power plants are the only which can ensure stability of the NPG in this region and, in the same time, the stability of Transilvania NPG area, which is an area of NPG with high deficit of electricity generation units.**

Entering into the electricity market, in the latest years, of electricity produced from renewable energy sources, especially wind and photovoltaic power plants, had the following consequences:

- Reducing market share especially for the producers of coal based electricity (hard coal and brown coal);
- Uneconomical operation at partial loads, of the power units operating on coal;
- Increasing the cost of electricity to the final consumer level due to the application of the support schemes, etc.

According to the data presented above, the market share of CEH during 2012-2014 was reduced from 5.9% to 4.25%. This reduction should be analysed in connection to the evolution of wholesale market transactions during this time period. According to the reports presented by ANRE, during 2012-2014 there was a reduction in the average selling price of electricity, as follows:

- from 215,2 lei/MWh to 173,9 lei/MWh on bilateral contracts centralized markets;
- from 217,47 lei/MWh to 153,0 lei/MWh on day ahead market; - from 297,57 lei/MWh to 162,63lei/MWh on the intraday market;
- from 291,61 lei/Mwh to 243,35 lei/MWh on the balancing market.

With an average price of 271 lei / MWh, CEH is situated among the electricity producers with the highest price.

In these circumstances it is difficult to participate to the competitive internal energy market.

If we also analyse the export average selling price evolution during 2012-2014, it can be notice the decrease of price from 223.15 lei/MWh to 173.47 lei/MWh in 2014 when Romania's exports reached a peak of around 7 TWh.

It results that CEH, in the current operating conditions, does not have competitive conditions to participate to the electricity export.

2.1 The general analysis of the regional coal market. Identification of the main implications for the company

The coal plays an important role in the European economy. Over 25% of EU electricity comes from coal, in this industry and related businesses working more than 200.000 people.

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Balancing the need for coal with the environmental impact, is a challenge for both the coal industry and European policy makers.

The economic arguments for coal have recently changed the balance in its favour. After years of decline, the demand for coal in the EU has started to rise again. On the other hand, many coal power plants will face closure due to new air pollution limits that shall come into force in 2016. Coal production in EU shall be affected by the stage of granting state aid for the closing of coal mines by 2018.

Furthermore, the policies to reduce the greenhouse emissions have profound implications in the coal industry. 87% of EU CO2 emissions come from electricity generation. The only way to reconcile the use of coal in the power system is a greater flexibility of approach and efficient absorption of carbon dioxide.

The European Union is the third coal region, after China and North America. Each year, there are extracted about 130 million tons of coal and other 210 million tons are imported. 25% of electricity comes from burning hard coal and brown coal. Despite these statistics, the use of hard coal and brown coal to produce electricity is not always seen positively. These resources are abundant, known and accessible to contribute to the EU's energy security and competitiveness. 88% of primary fossil energy reserves in the EU are hard coal and brown coal. Important to be noted, is that EU energy policy with its objectives, has enabled the energy consumers to switch to gas. This is one of the reasons why gas is so expensive.

Worldwide, the hard coal and brown coal reserves are sufficient for the next 137 years at current production levels. Unlike oil and gas, the coal is widely distributed around the world with the largest reserves in the US, Russia and China.

For this reason, the coal gives a higher level of security. Most of the coal produced (extracted) is used in the countries in which extraction is performed. Where there is an internal source of coal, the supply guarantee is obvious. Where coal is imported, the economy is supported by a competitive market and a developed infrastructure. The 3% share of the EU of global reserves of energy resources is quite low.

2.2 Main implications for CEH

- At European level, even if there is the approach of necessity, continuance and increase the coal production (because there shall be provide energy stability by exploiting the existing reserves of coal and thus create the position reserve in relation to oil and gas), the existence / non-existence of coal mining in Romania, producing 11.5 million tonnes per year is insignificant as quantity and quality, also involving high operating costs;
- Even if there is a discussion on an improvement in operating conditions required to the coal power plants emissions -related, it shall not produce a reversal of maintaining in function, respectively maintaining the production capacities of Romanian hard coal mining parameters currently performed and their operation must be carried in a competitive Europe;
- The only mention is that at this point if it is strategically chosen to maintain the capacity of coal production, there should be given time and adequate financial funds for optimization/ rehabilitation / restructuring.

2.3. The analysis of the strategic direction and competitive position of CEH

By nature, scale and the economic, social and political activities involvement, Valea Jiului mining field has occupied, and is still occupying a national distinctive position. As limited, relatively geographically isolated area, Valea Jiului has generated a particular social and economic problem.Valea Jiului hard coal production has increased continuously from 4,182,953 tons in 1960, 7,816,152 tons in 1970, 9,236,400 tons in 1980and 11,890,368 tons to 1989.The economic results still continued to go done because the staff layoffs were not preceded or followed by technical restructuring and reorganization. It can be estimated that the development of production costs and the elimination of subsidies on production (required by the EU) shall led to the reduction of the competitiveness of the domestic hard coal production price, compared to the coal prices on international markets and therefore to the significant reduction of the production. The deposits in Romania are situated in complex geo-mining conditions and the mineralogical characteristics, those influencing the quality of coal, are at the bottom end. In terms of economy and energy for the electricity production, the domestic hard coal, without subsidies to support an investment program necessary to achieve quality production, is not competitive against the imported energy coal.

3. Income structure analysis and identification of main risks and of critical constraints

The incomes of CE Hunedoara come from sale of electricity on different markets, sales of heat and from ancillary services provided within NPG (secondary frequency control, fast tertiary reserve and slow tertiary reserve). The income structure of CE Hunedoara in 2014 is shown in Figure 1.

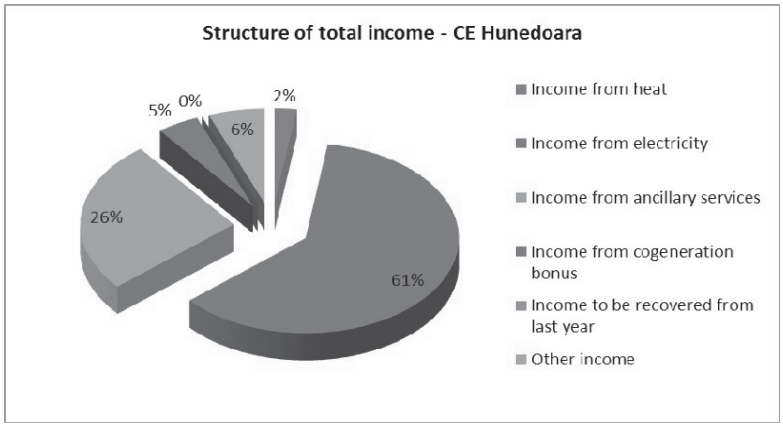

Fig. 1. *Income structure of CE Hunedoara in 2014*

This chart shows that the income achieved from sale of electricity on specialized markets had the highest percentage among the income of CE Hunedoara in 2014(61%), followed by the income achieved from ancillary services (26%).

Revenues achieved from sales of heat are 2%, plus revenues obtained from cogeneration bonus (5%) from total income of the company. The incomes achieved from cogeneration bonus were obtained due to cogeneration operation of power units within CE Hunedoara correlated with heat demand of consumers.

In 2014, electricity delivered by CE Hunedoara was traded mainly on Day Ahead Market (DAM), on the balancing market and to eligible consumers. Thus, electricity sales on DAM represented more than 87% of transactions, while sales on the balancing market accounted for about 7%.

Average sale prices used by CE Hunedoara

The average price of secondary frequency control (SFC) has the highest value during the analyzed period. At the same time, the price for slow tertiary reserve (STR) had a substantial increase in 2013 compared to 2012

Within the mining sector, the object of activity is the exploration, development, preparation and exploitation of hard coal and accompanying gas, clays, sludge, ballast and sand inside the perimeters that the Company received operating permits.

The mining branches own permit for coal exploitation inside the leased perimeters up to 2024. The leased perimeters have a hard coal reserve of 300 million tons.

The exploitable coal reserve is of 56 million tones, providing exploitation continuity at current extraction level during the next 37years.

Table 1 *Technical condition of mining branches*

No	Description	Lonea	Livezeni	Vulcan	Lupeni
1	Number of exploitation permit (availability period)	1571/2000 (20 years)	1573/ 2000 (20 years)	1575/2000 (20 years)	1577/2000 (20 years)
2	Geological condition of coal deposit	Trap with SW-NE direction of layers and 10^o-35^o hade towards North-West, faulted	Anticlinal fold faulted towards NW – SE or SW - NE	Synclinal towards N 3555^o and S 15^o – tapered out and divided layers-	Synclinal with asymmetric walls. Layers are inclined towards N-S or NE-SW
3	Reserves balance $A+B+C_1$ on 01.01.2015	7.186.609 tone	71.078.000 tone	23.155.000 tone	30.793.000 tone
4	Open reserve on 01.01.2015	1.376.520 tone	1.420.400 tone	1.219.050 tone	529.900 tone
5	Provision level with open reserves on 01.01.2015	5,68 years	3,5 years	4,76 years	1,2 years
6	Prepared reserve on 01.01.2015	173.180 tone	359.400 tone	491.050	216.200 tone
7	Provision level with prepared reserves	8,57 months	12 months	22,99 months	5,89 months
8	Volume of opening works necessary for 2016 – 2024 (according to FS)	3460 m	1105 m	3700 m	1832 m

No	Description		Lonea	Livezeni	Vulcan	Lupeni
9	Index of required opening ml/1000t		0,83	0,58	0,76	0,29
10	Volume of preparation works necessary for 2016 – 2024 (according to FS)		17.493 m	16.508	19.643 m	17.147 m
	Index of required preparation ml/1000t		4,22	3,56	4,5	3,06
12	Coal layers under current exploitation		Layer 3	Layers 3 , 13	Layer 3	Layers 3 and 5
13	Coal Quality Parameters	Moisture	3,7 %	4,29 %	1,10-7,90 %;	0,50-17,20 %;
		Ash on dry coal	36.43 %	22,95 %	5,30-49,60	6,00-38,40 %;
		Total Sulphur	2,01 %	3,08 %	0,54-6,18 %;	1,08-10,94 %;
		Lower heating value	3743	5731	4243-7107	3400-
			kcal/kg	kcal/kg	kcal/kg	8100kcal/kg
14	Production estimated in 2015 Total CEH - 1340 thousand tones		240.000 tones/year	400.000 tones/ year	260.000 tones/ year	440.000 tones/ year
15	Total number of employees		**916**	**951**	**777**	**1326**
16	Exploitation methods used	using long wall of thin layers with tall inclination pillars	-	Layers13 and 5	-	-
		using long wall of thick layers	-	Layer 3	-	-
		Framework method with undermined bed for thick layers and average inclination (α LAYER=$25^0 \div 45^0$),	Layer 3	- -	Layer 3	-
		Exploitation of thick layers in horizontals slices with short long walls, with partial airing	Layer 3	- -	-	-
		Exploitation of thick layers in horizontals slices using long walls	Layer 3	- -	-	-
		Exploitation of thick layers with average inclination through undermining behind the front line		-		Layer 3
		Combined exploitation forward-backward under the form of slices with long walls		-		Layer 3
17	Technical condition of equipment (worn, with normal operation time exceeded)		x	x	x	x
18	Environmental permit granted on		HD 28 31.01.2013	HD 151 11.05. 2012	HD 29 31.01.2013	HD 6 17.02.2013
19	Other important parameters		Undermining layer 5, Layer 3 in preparation works delayed	Long routes for underground transport except layer 13 limitation of general airing	Undermining layer 5 coke 47,80-72,50 %;	Large water inflow Noncompliance with opening and preparation parameters

For analyzing the generation capacity at Lonea, Livezeni, Vulcan and Lupeni mining branches, Table 1 shows the technical condition of the mining units.

The above-mentioned data show that the reserve level (availability) of coal open reserves ranges from 1.2 years (Lupeni) to 5.68 years (Lonea), while the provision level (coal availability) of prepared reserves ranges from 6 months (Lupeni), to 23 months (Vulcan).

Internal limitations in optimizing production level within the mining units are related to:

- Difficult geological conditions/cracking of coal deposits, presence of methane and coal self-ignition tendency.
- Failure to comply with the principle of mining exploitation starting from the extremities to the central axis (not applied in order to get into operation in a short time and with reduced operating expenses), led to a reduction of development opportunities and of available coal-mining areas.
- Failure to perform opening works (see the provision level at Livezeni and Lupeni) and preparation works (see Lupeni, Livezeni and Lonea)
- High volume of preparation works and opening works to provide replacement capacity for production.
- High content of ash and Sulphur;
- Low contribution of mechanized technologies in coal extraction,
- All mining units use old mining machinery and equipment, whose lifetime is exceed.
- Lack of supply and available materials mainly due to low financial resources.
- Providing more personnel in the extent of rating the mining activities;
- Undermining the coal layers;
- Long routes for underground transportation;
- Limitations of providing fresh air of working faces;
- High level of underground inflows that require continuous discharge to surface performed at high costs.

References

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