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# INFORMATION MEMORANDUM FOR THE TURCENI ENERGY COMPLEX



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# INFORMATION MEMORANDUM FOR THE TURCENI ENERGY COMPLEX

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## 1.0. EXECUTIVE SUMMARY

### Introduction

The Government of Romania, in the context of its program of economic reform and support for the revitalization of its domestic energy industry, intends to privatise its interests in the state-owned Turceni Energy Complex (*Complexul Energy Turceni, S.A.*) This Information Memorandum provides specific information on the assets of the Turceni Energy Complex (TEC) and on the legal, regulatory, commercial, and market environments in which the TEC presently operates and which will likely endure after its privatisation. No representation is made as to the infallibility of the information provided in this Information Memorandum, and prospective investors are cautioned to conduct their own due-diligence with respect to the TEC before entering into any transaction for the purchase of the TEC or associated assets.

### Country Background

Romania is one of the largest countries in the Central European region, located on the Western shore of the Black Sea, in Southeast Europe and covering an area of over 238,000 sq km. Romania's neighbours are Hungary, Ukraine, Moldova, Bulgaria, and the State of Serbia and Montenegro, with the Black Sea to the Southeast. The capital city is Bucharest, with a population of over 2 million.

According to the Census of March 2002, Romania's population numbered approximately 22 million, with an average density of 91 inhabitants per square kilometer, 52.7% of who inhabited urban areas. Romania's population is relatively young with an average age of 34.6 as of the year 2000.

The Romanian economy is an industrial/agrarian one. The manufacturing sector, diverse both in composition and in geographic dispersion, includes: a metallurgy and steel industry, the oil industry and petrochemicals, wood & wood processing, shipbuilding, textile, leather, and food processing. Industrial output decreased sharply in the years following 1989 because of the collapse of the Romanian planned economy, followed by years of political instability, restructuring delays and insufficient investment. Romania's economy has begun to recover in recent years, with industrial output increasing by 3.2% from 2002 to 2003 and 5.3% in 2004, and with GDP growth among the fastest of any European country at 8.3% in 2004.

Romania has a diverse range of mineral resources, although in limited quantities: coal (mostly lignite), gold, silver, wood, uranium, and salt (important reserves). Oil and natural gas deposits are not sufficient to satisfy the current domestic consumption.

The total coal reserves of Romania amount to approximately 1 gigatonne of hard coal and 3 gigatonnes of brown coal and lignite and are sufficient to cover power generation needs for 70 years. More than 90% of the Romanian coal reserves are in the Oltenia Region, which is located between the river Olt and the Danube. This basin includes the lignite deposits of Rovinari, Motru, Jilt, Berbesti-Alunu and Mehedinti. More than 80% of Romanian lignite reserves can be mined profitably in open-pit mining, while the remaining 20% require underground mining.

### Energy Sector Development Strategy

Upgrading the Romanian national energy system to meet the growing demands of its modernizing economy and integration into a wider Europe will require large-scale investments for upgrading and rehabilitating existing assets, as well as for investments in new capacity. As part of its strategy to mobilize the necessary capital, the Romanian government resolved to accelerate the pace of the privatization processes of much of the country's energy infrastructure, including the country's eight



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electricity distribution companies, two natural gas distribution companies, and the bulk of power generation.

At this stage there are no plans for the privatization of the transmission companies (TransElectrica and TransGaz). However, the national strategy does provide for private development of new gas fields and private companies are already operating new gas production.

The main goal of privatization in the energy sector is the attraction of the necessary capital to support their long-term viability and Romania's energy security, rather than a maximization of proceeds for the state budget. The Romanian government has pursued the consolidation of the appropriate legal and regulatory environment and market structures with stable and transparent rules as a means to promote the privatization process in the energy field. The electricity regulatory body, ANRE, was set up with the objective to create and implement mandatory regulations for the proper operation of the electricity and thermal energy sectors alongside with ensuring efficiency, competitiveness, and transparency and consumer protection.

### **The Turceni Energy Complex**

Turceni S.A. ("Electrocentrale Turceni") was created in 2003 through Government Decision No. 1524/2002 regarding the re-organization of its predecessor company, Termoelectrica S.A. Decision No. 1524/2002 established Electrocentrale Turceni as a separate legal entity, albeit as a wholly owned subsidiary of Termoelectrica. The initial share capital of Electrocentrale Turceni was ROL 4,263,324,039,000 divided into 42,633,240 shares, each share having a face value of ROL 100,000 (\$3.40 as of May 2005.)

Turceni is located halfway between the towns of Craiova and Targu Jiu. The plant facilities occupy some 839 hectares. It is the largest lignite-fired power plant in Romania with a nominal installed capacity of 2310 MW (7 x 330 MW installed power, the eighth unit was never completed) and a current operational capacity of about 1260 MW (5 x 330 MW operational units, 1 unit in rehabilitation, one unit retired from operation, net power delivered into the system by one 330 MW unit at around 285 MW of actual capacity). The units were commissioned over the period from July 1978 (unit 1) through November 1987 (unit 7).

The plant currently has 1,312 employees, of whom 159 hold degrees from institutions of higher learning, 1140 are high school graduates, and 13 are low-skilled workers. These personnel figures reflect several recent lay-offs and the shedding of some non-core activities from the company.

Turceni plays an important role in the Romania's power balance. During summer 2003, when a serious drought led to a decrease in nuclear electricity output (because of not enough cooling water in the Danube) and to a decline of hydro electricity outputs (run-of-the-river Hydro Power Plants like the Iron Gates were affected by the lowest Danube water level in the last 160 years), the lignite-fired generation of Turceni and Rovinari helped cover a load that increased dramatically due to the demands of air conditioning. Turceni proved to be crucial for covering the Romanian electricity consumption. Moreover, as Romania has the largest and most stable power system in the Balkan Peninsula (and is synchronously interconnected within the UCTE), it contributed to stabilizing of the entire region, affected as a whole by the high temperatures and serious droughts.

Given the merit order dispatching of the output of Romanian power plants and the perspectives for further cost reduction, the Turceni TPP has excellent chances of being dispatched continuously at an optimum load level.

### **THE ASSOCIATED COAL MINES**

The Turceni TPP is supplied with lignite from various coalmines that are located within 15 and 120 kilometers from the power plant.



The Government of Romania has stipulated in the Government Decision 103/2204 regarding the measures for reorganizing of the thermal and electricity energy production base on lignite which mining assets will be bundled into the Turceni Energy Complex. A summary of the coalmines lignite supplies to Turceni TPP in 2004 is presented in the table below. The mines bundled with the Turceni TPP are presented in yellow. The indicated exploitations have proven reserves, which will cover a long period of operation of the plant and can almost entirely meet the plant lignite consumption. During 2004 some 120,000t have been supplied from the Anina mine, placed approximately 120 km away from TPP. More details on associated coal mines are provided in Chapter 7.

**Table 1.1: Year 2004 Lignite Quantities CNLO to Supply to Turceni TPP  
(by coalmine)**

Coalmine	Year 2004 Planned Off-take	Coalmine Annual Production Capacity	Annual Production (as % of Total Capacity)	Coalmine Industrial Reserves
Jilt Sud	3,100,000 t	3,395,000 t	91%	171,672,000 t
Jilt Nord	2,100,000 t	2,425,000 t	87%	127,024,000 t
Pesteană	1,900,000 t	1,900,000 t	100%	44,383,000 t
Rosia	1,350,000 t	3,800,000 t	36%	215,496,000 t
Dragotesti	380,000 t	500,000 t	76%	1,533,000 t
<b>Total</b>	<b>8,830,000 t</b>	<b>12,020,000 t</b>	<b>73%</b>	<b>560,108,000 t</b>

Source: Data Room Information

#### **RAILWAY INFRASTRUCTURE OF THE COMPLEX**

The Turceni Energy Complex will include railway assets whose primary purpose is for the delivery of coal to the complex. The railway assets to be included in the Turceni Energy Complex are:

- Turceni-Dragotesti railway track, electro-dynamic centralized, of 29km in length, on one track with two stations, Turceni and Dragotesti, and one halting place, Borascu;
- 6 maneuver lines, of 750m length each, inside Turceni station, i.e. lines 8, 9, 10, 11, 12, 13;
- A depot facility for locomotives inside the Turceni station, including the building and related assets;
- One electric device for revision (?) of the contact line;
- Borascu halting place, with 2 railway lines of 720m length each, including the related buildings and facilities;
- Dragotesti station, with 7 lines of 750m each, including the related buildings and facilities;
- FALS railway cars - 520 units;
- EA-5100 kW electric locomotives- 5 units;
- LDE 2100 CP Diesel electric locomotives - 1 unit;
- A hangar for rail cars inside the Turceni station, including 2 lines dedicated to repairs and maintenance, a compressing station and other facilities.



## Energy Sector Legal Reform and Market Development

In July 2003, the Romanian Government adopted the Roadmap for the Energy Sector, as a reply to the European Commission Roadmap for Bulgaria's and Romania's accession to the EU, elaborated after the Copenhagen EU summit in December 2002. The document has been published in July 2003. This entire document is available both in Romanian and English at <http://www.minind.ro>.

The energy structure and energy market model is undergoing a rapid transformation towards a fully liberalized and competitive wholesale market. The market will function through bilateral, freely negotiated contracts between internal producers and eligible consumers or with other suppliers who will sell electricity to eligible consumers. Eligibility will be increased step by step till the full opening of the market (see table below). On the open market, eligible consumers, power suppliers and even the distribution companies will have the opportunity to trade electricity by direct and free negotiation or through a spot market and a day-ahead market. Negotiated contracts will be concluded by producers and self-producers with distribution and supply companies.

Export contracts will be directly negotiated by the producer with customers abroad. Romania has implemented the regulated third party access both for transmission and distribution, and related tariffs have been published.

Both existing and the new entrant participants on the electricity market will be treated equally on a transparent and non-discriminatory basis, which also includes the regulated access to the transmission and distribution networks. In this respect, connection to the grid is a compulsory public service.

At present, the Romanian Wholesale Electricity Market (REM) comprises two parts: a competitive market, and a regulated market.

The role of the regulated market is to assure adequate transactions between producers and suppliers of captive consumers, corresponding to the final consumption of the captive consumers. Prices on this regulated market are established in order to cover costs and to include a reasonable profit. The quantity of electricity transacted on the regulated electricity market will decrease gradually as the competitive market evolves and grows to replace it.

The energy market liberalization will proceed per the following schedule:

**Table 1.2: Program for Electricity and Natural Gas Market Opening**

	Actual opening 1.01.2003	Opening on 31.12.2003	Opening on 31.12.2004	Opening 01.07.2005 (elect.) and 31.06.2006 (gas)	Opening 01.01.2007	Opening on 01.07.2007
Electricity	33%	40% (20 Gwh)	55% (1 Gwh)	83.5%	100% industrial	100% domestic
Natural Gas	30%	40%	50%	75%	100% industrial	100% domestic

The development of the competitive wholesale electricity market will include the introduction of Initial Contracts (replacing the present portfolio contracts) and the Initial Option Contracts, the development of the day-ahead and spot markets (compulsory in the beginning and later voluntary), opening of spot balancing market and possible introduction of a capacity-contracting obligation. A set of energy accounting and settlement arrangements will be introduced to support these transactions.



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## Regional Market

There is significant opportunity for Romania through the integration of the national power market into a developing regional market and a further integration in the Internal Electricity Market of the European Union.

Romania should play an important role in the South-Eastern Europe Electricity Market and, along with other countries of the region, should ensure the balance of capacities in the second synchronous zone. The evolvement of contractual relations should lead to the establishment of a regional energy market of the countries in the region in the context of the Regional Electricity Market initiative (Albania, Bosnia-and-Herzegovina, Bulgaria, Greece, Macedonia, Romania, Serbia, Montenegro, and Turkey.) The regional market, in which Romania will likely play an important role, represents a significant step for further integration within the EU energy market, and is expected to provide better opportunities for free trade and for marketing. Romania has announced an initiative to set up a national/regional power exchange in Bucharest, and multi-party discussions on this proposal are pending.





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## 2.0. GENERAL OVERVIEW OF TURCENI ENERGY COMPLEX (TEC)

### 2.1. Background

#### BRIEF HISTORY OF REORGANIZATION/RESTRUCTURING OF ELECTRICITY AND LIGNITE MINING SECTORS

The creation of the Company is the result of several reorganizations of Romanian **electricity-heat generation** and **mining** sectors carried out during the last 15 years as part of Romania's policy to head towards a market-driven economy.

The process started in **1990** with the creation of **Renel RA** a wholly state-owned enterprise, which included as business object, *inter alia*, the production, transportation and distribution of the electricity, and the production, transportation and distribution of heat, and of **RAL** a public enterprise, which included as main business object activities related to the lignite extraction.

RAL, a public enterprise, was set up through the Government Decision No. 1211 of 12 November 1990 on the basis of Law No. 15/1990 as an autonomous entity, including as main business object activities related to the lignite extraction. For more details regarding the legal framework please refer to Section 2.2.1, below. Concurrently, the Government set up another autonomous entity - *Regia Autonoma a Huilei*, through the Government Decision No. 1212/1990, a public enterprise which had as main business object activities related to the pit coal extraction.

In **January 1995**, RAL was reorganized, ceasing its existence. As a result, two new autonomous regias were set up, namely, **RALO** and the Autonomous Regia of Coal Ploiesti.

In **September 1997** RALO was reorganized into a new state-owned company **CNLO S.A.** or the National Corporation of Lignite Oltenia S.A. CNLO's main business object included, *inter alia*, the carrying out of mining activities and trading of mining products. The share capital was wholly owned by the state represented by the Ministry of Industry and Commerce (currently the Ministry of Economy and Commerce).

In **1998** Renel R.A. was reorganized and ceased its existence, the result being the setting up of two new companies and an entity of a strategic interest, specifically the National Electricity Company S.A. or **CONEL S.A.**, the National Company *Nuclearelectrica* S.A. and the Autonomous Regia for Nuclear Activities -an autonomous regia of strategic interest. In **2000**, **CONEL S.A.** was reorganized into three joint stock companies and a national corporation. One of these newly established companies was **Termoelectrica SA** or the Electricity and Heat Production Company.

In another change a few month later, in July 2000, through the Government Decision No. 627/2000 Conel S.A. ceased to exist by spin off into four new companies:

- (i) The National Electricity Transmission Company "*Transelectrica*" S.A., a national company whose business object consisted of the transport, dispatching, organisation and management of the electricity market and **OPCOM** the Operator of the Electricity Market S.A. was set up, a wholly-owned subsidiary of *Transelectrica* S.A.
- (ii) *Termoelectrica* S.A., a state owned joint-stock company whose main business object consisted of production and supply of electricity as well as production, transportation, distribution and supply of heat based on licenses granted in accordance with the law;  
*Hidroelectrică* S.A., a state owned joint-stock company whose main business object included production of electricity and supply of electricity; and



- (iii) *Electrica S.A.*, a state owned joint-stock company whose main business object consisted of supply and distribution of electricity as well as operation and development of the distribution, telecommunications and IT systems.

Termoelectrica S.A. had an initial share capital of ROL 24,612,370,400,000 divided into 246,123,704 shares, each having a face value of ROL 100,000. The sole shareholder was the State represented by the Ministry of Industry and Commerce (currently the Ministry of Economy and Commerce) such as in case of the other three companies.

*Turceni S.A.* (“**Electrocentrale Turceni**”) was initially a branch of Termoelectrica, without being a separate legal entity. In 2003, through the Government Decision No. 1524/2002 regarding the reorganization of Termoelectrica S.A., Electrocentrale Turceni was transformed into a wholly owned subsidiary of Termoelectrica. The initial share capital of Electrocentrale Turceni was ROL 4,263,324,039,000 divided into 42,633,240 shares, each share having a face value of ROL 100,000.

The share capital was made up by the takeover of a part of Termoelectrica’s patrimony, according to the balance sheet drawn up as of 31 December 2002. The shares were held by Termoelectrica S.A, on behalf of the State, until the transfer of shares to private Romanian or foreign natural or legal persons in the context of the privatization of Electrocentrale Turceni or to its legal successors.

Through the Government Decision No. 273/2003 regarding the setting up of several subsidiaries through the reorganization of several activities of Termoelectrica, a part of Electrocentrale Turceni’s patrimony in the amount of ROL 35,638,846,000 was taken over by a newly set up subsidiary of Termoelectrica, specifically Termoserv – Turceni S.A., making up its share capital. Thus the activity of service and repair of its core business assets was outsourced from Electrocentrale Turceni. Termoelectrica’s share capital decreased accordingly. The decrease of the share capital is reflected into the additional act to the statute of Electrocentrale Turceni, dated 14 January 2003.

The last major change occurred in **2004**, when through the merger of the three subsidiaries of Termoelectrica S.A. (including Electrocentrale Turceni) and parts of the patrimony of CNLO, three new state-owned companies have been set up. Through the Government Decision No. 102/2004 the Strategy of accelerating the investment inflow and privatization in the electricity and heat sector was approved.

In parallel move the Government issued in the same period the Decision No. 103/2004 regarding the setting up of the following state-owned companies:

- (i) Complexul Energy Rovinari S.A;
- (ii) Complexul Energy Turceni S.A.; and
- (iii) Complexul Energy Craiova S.A.

The new companies were set up through the merger of some subsidiaries/part of subsidiaries of Termoelectrica S.A. and a part of the patrimony of CNLO. The Appendix No. 2 to the Government Decision No.103/2004 contains the constitutive act of the Company under the form of a statute.

Through the Government Decision No. 103/2004 CNLO was partially reorganized. Consequently the National Company of Lignite Oltenia or **SNLO** was set up by the detachment of few mines and the mining operation from the patrimony of CNLO. As a consequence of this reorganization, the new corporate name of CNLO was changed to **SCIM** the Company for Closing and Preservation of Mines S.A. Targu Jiu.

The new business orientation of SCIM is the collection of claims and the payment of debts incurred by the mining exploitations, which merged with the thermo-electric power plants (Turceni, Rovinari and Craiova) as well as the closure of the remaining non-profitable mines to eliminate economic losses. SCIM can also make proposals to the Ministry of Economy and Commerce (in accordance with the Privatization Law) in relation to the privatization of certain assets that can be transferred in the privatization process.



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## THE TURCENI ENERGY COMPLEX

The Turceni Energy Complex was created through the reorganization and restructuring of the activity of lignite fired power generation by creating energy complexes in which mining exploitations be integrated as cost centers for the electricity generator. The Turceni Energy Complex includes the Electrocentrale Turceni S.A., the Jilt mines and the Dragotesti mine. This complex will also include the activity of lignite transportation by railway.

The Government Decision (GD) 102/2004 was shortly followed by GD 103/2004, focusing on several measures for restructuring the lignite-fired generation of electricity and heat. The social capital of the Energy Complex Turceni S.A. is 4.567.414.652 thousand ROL and is constituted by the social capital of the Electrocentrale Turceni S.A. and a part of the social capital of the National Lignite Company "Oltenia"- S.A. Targu Jiu, respectively the social capital pertaining to the Jilt open cast mines and Dragotesti mine, based on the balance sheet as of 31.12.2003.

### 2.2. The Turceni Power Plant

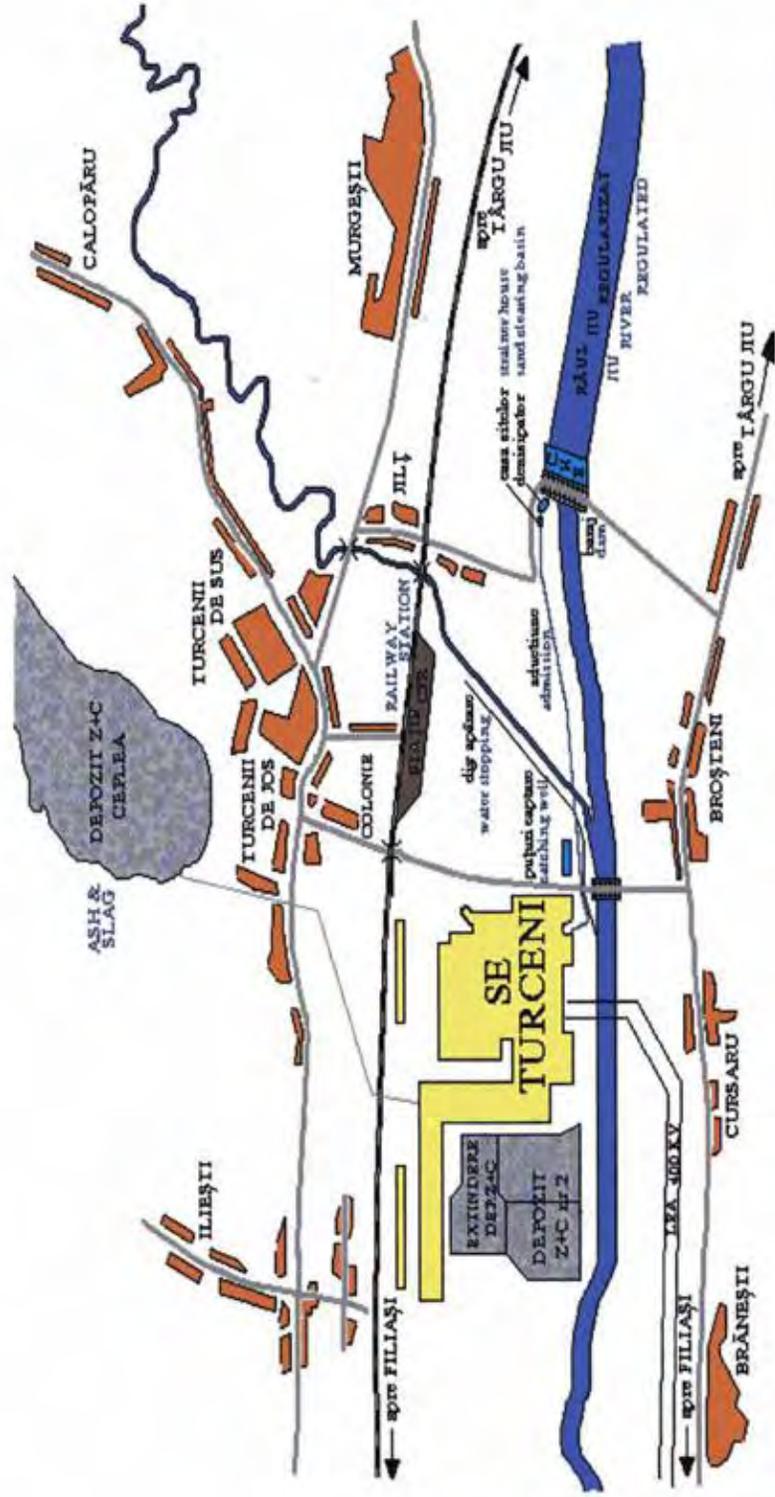
Turceni is located half way between the towns of Craiova and Targu Jiu. The plant facilities occupy some 839 hectares. It is the largest lignite-fired power plant in Romania with a nominal installed capacity of 2310 MW (7 x 330 MW installed power, the eighth unit was never completed – investment abandoned) and a current operational capacity of about 1260 MW (5 x 330 MW operational units, 1 unit in rehabilitation, one unit retired from operation, net power delivered into the system by one 330 MW unit around 285 MW actual capacity). The units have been commissioned during the period July 1978 (unit 1) - November 1987 (unit 7).

The condensation power generation units are of a block design: boiler, turbine, and generator, with the following main nominal parameters (more details are provided in Chapter 6):

- Boiler: tower type, with forced draught, intermediary superheating, Babcock license
  - Live steam flow: 1035 t/h
  - Live steam temperature: 540°C
  - Live steam pressure: 192 bar
  - Lignite consumption 470 t/h
- Turbine: Rateau-Schneider license, 4 cylinders on one rotor line
  - Nominal output: 330 MW
  - Economic output: 315 MW
- Generator: synchronous, Alsthom license, hydrogen cooling
  - Nominal active power: 330 MW
  - Apparent power: 388 MVA



Figure 2.1: General Plan of Plant Positioning

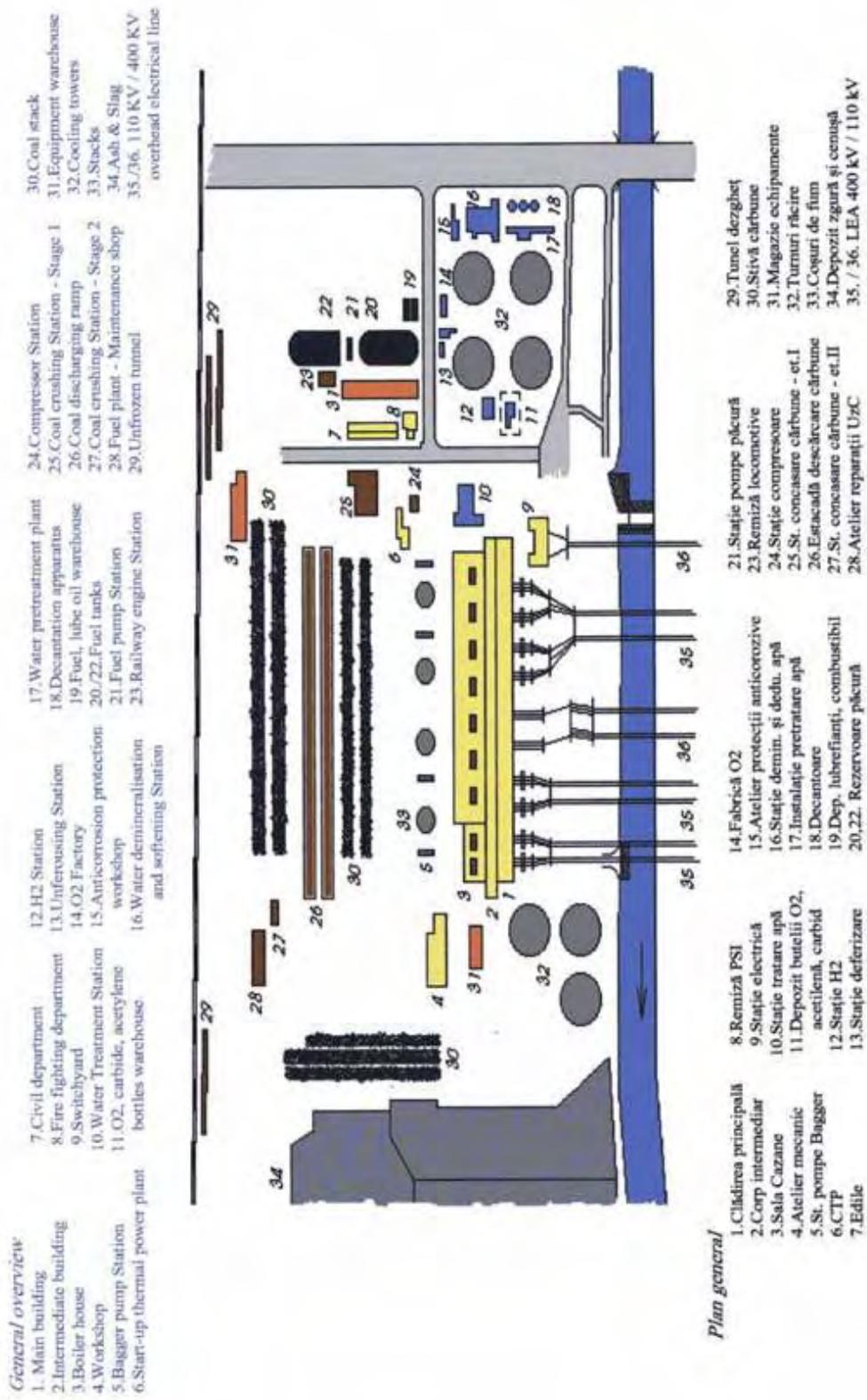


Plan de amplasare

Settlement plan



Figure 2.2: General Plant Layout





The plant power output is evacuated to the national power system via transformers of 24/400 kV and 4 lines of 400 kV (each line for two units), towards the system substation of Tantareni, located several km away. For reserve power supply of internal consumers, the plant is supplied via 6 lines of 110 kV (3 substations of 110/6 kV).

The main fuel is lignite with a low heat value of 1400-1800 kcal/kg, supplied by train from an average distance of 35 km. The plant is operating an unloading and storage system with a capacity of about 1 million tones (about 30 days of nominal consumption). The plant is supplied with heavy fuel oil (start-up fuel) by train from different sources and uses as main support fuel the gas extracted from a well belonging to Petrom and supplied by a direct pipeline to the plant.

The cooling water is supplied from the Jiu river, mixed with water from 7 cooling towers with natural draught (the ratio being 12 m<sup>3</sup>/s per unit open cooling circuit vs. 0.75 m<sup>3</sup>/s per unit closed circuit). Ash and slag is evacuated by hydraulic transport to the Valea Ceplea storage with a deposit capacity of about 18 million m<sup>3</sup> and a reserve in the second storage of about 8 million m<sup>3</sup>. A micro Hydro Power Plant was installed on the water inflow towards the plant, with an installed output of 10 MW (3x 3 MW + 1x 1 MW).

The operational history of the plant generating units can be described by the following two tables:

**Table 2.1: Turceni TPP Gross Energy Output, Including Hydro Plant, for Each Year (in GWh)  
From the Start-up Date Until December 31, 2004**

Year	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	TPP	HPP	TOTAL
1978	255							255		255
1979	441	302						743		743
1980	841	883	82					1806		1,806
1981	242	1,043	1,143	0.4				2,428.4		24,28.4
1982	834	407	682	954				2,877		2,877
1983	514	705	910	816	146			3,091		3,091
1984	528	512	755	814	1,097			3,706		3,706
1985	505	385	471	844	568	228		3,001		3,001
1986	213	630	395	226	687	730		2,881		2,881
1987	596	456	88	468	673	864	69	3,214		3,214
1988	829	106	658	721	493	492	1,248	4,547		4,547
1989	480	113	995	778	447	915	1,011	4,739		4,739
1990	0	461	667	58		486	886	2,558		2,558
1991	646	555	343			834	97	2,475	4	2,479
1992	854	994	816			307	1,084	4,055	3	4,058



Year	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	TPP	HPP	TOTAL
1993	1,001	418	156			275	1,028	3,878	7	3,885
1994	1,014	1,144	820			1,347	139	4,464	8	4,472
1995	877	1,421	343			1,273	714	4,628	9	4,637
1996	697	1,047	109			1,129	1,651	4,633	16	4,649
1997	357	650	1,207			340	953	3,507	15	3,522
1998	136	17	1,118			788	957	3,016	19	3,035
1999	540		1,100			637	1,171	3,448	20	3,468
2000	1194		1,672			400	1,782	5,048	7	5,055
2001	1296		1,453			1,269	1,160	5,178	6	5,184
2002	916		969	1,194		1,132	1,583	5,794	6	5,800
2003	1400		1,168	2,032		1,016	1,170	6,786	13	6,799
2004	573		1,450	1,689		630	1,323	5665	19	5,684
<b>Total</b>	<b>17,779</b>	<b>12,249</b>	<b>20,570</b>	<b>10594.4</b>	<b>4,111</b>	<b>15,092</b>	<b>18,026</b>	<b>98,421.4</b>	<b>152</b>	<b>98,573.4</b>

**Table 2.2: Turceni TPP – Operating Hours Since Start-up Until December 31, 2004**

Year	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	TPP
1978	1,329							1,329
1979	2,335	1,619						3,954
1980	4,780	5,056	591					10,427
1981	1,666	6,060	6,267	6				13,999
1982	5,200	2,615	4,104	4,339				16,258
1983	3,265	3,637	4,907	4,319	682			16,810
1984	2,916	3,031	4,713	4,651	5,583			20,894
1985	3,410	2,722	3,123	5,042	3,549	1,067		18,913
1986	1,538	4,097	3,158	1,481	4,394	3,766		18,434



Year	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	TPP
1987	2,859	3,159	701	2,993	4,431	5,283	374	19,800
1988	4,413	775	3,666	4,589	2,988	2,693	5,680	24,804
1989	2,603	610	5,966	4,994	2,730	4,667	4,340	25,910
1990	0	2,625	4,488	534		2,680	4,920	15,247
1991	3,310	2,727	2,005			3,896	581	12,519
1992	4,046	4,651	3,619			1,276	4,379	17,971
1993	4,672	1,952	5,331			1,185	4,616	17,756
1994	4,483	4,629	3,626			5,409	582	18,729
1995	3,880	6,013	1525			5,290	3,029	19,737
1996	3,464	4,844	,482			5,145	7,183	21,118
1997	1,437	2,719	4,511			1,466	4,000	14,133
1998	543	95	4,275			3,013	3,615	11,541
1999	2,017		4,014			2,425	4,152	12,608
2000	4,188		5,834			1,406	6,172	17,600
2001	4,733		5,374			4,603	4,169	18,879
2002	3,277		3,473	3,996		4,092	5,667	20,505
2003	4869		4,102	6,868		3,681	4,258	23,778
2004	2,113		5,339	5,874		2,433	4,773	20,532
<b>Total</b>	<b>83,346</b>	<b>63,636</b>	<b>95,194</b>	<b>49,686</b>	<b>24,357</b>	<b>65,476</b>	<b>72,490</b>	<b>454,185</b>

The units have been subject of several rehabilitation programs:

- A1 program – urgent repairs of units 2 and 6, in cooperation with ABB and Babcock Germany. It was financed via an IBRD loan and own financial resources. It has led to an increased time availability of units and an average output.
- A2 program – reconditioning of units 3 and 7, in cooperation with ABB, Babcock, Hannemann, Flender, Taprogge, Hartmann Braun (Germany), Voith (Austria), Alstom (France) financed by EIB loan and own financial resources. It has led to increased time availability and an increased average output.



- A3 program – rehabilitation of units 4 and 5, in cooperation with ABB Kraftwerke and Deutsche Babcock. Unit 4 was commissioned in April 2004; Unit 5 was scheduled for December 2004. It was financed via a KfW loan and own financial resources. It has led to increased time availability, average output, reduced fuel and internal electricity consumption.

The investment plan promoted by the plant management for next few years comprises has as main components:

- Rehabilitation of Unit 5 – the same basic engineering as for unit 4 – its commissioning expected for December 2005,
- Rehabilitation of units 3 and 6,
- Improvement of control capabilities as per UCTE requirements for two units,
- Installation of FGD (Flue Gas Desulphurisation) for units 3, 6, 4, 5,
- Cooling towers modernization,
- Increase of ash storage capacity,
- Covering one coal unloading facility for protection during winter and bad weather.

The intention of the plant management is to transform existing TPP into a plant with 4 generating units (No 3, 4, 5, 6), with a projected capacity for gross output as described in Table 2.4 below:

**Table 2.4: Management Projections of Plant Output**

	2003	2004	2005	2006	2007	2008	2009	2010
<b>Unit 1</b>								
Installed power (MW)	330	330	330	0	0	0	0	0
Available power (MW)	310	310	310	0	0	0	0	0
Functioning hours (h)	4869	5000	4500	0	0	0	0	0
Delivered energy (GWh)	1299	1340	1190	0	0	0	0	0
Energy output (GWh)	1400	1435	1280	0	0	0	0	0
<b>Unit 2</b>								
Installed power (MW)	0	0	0	0	0	0	0	0
Available power (MW)	0	0	0	0	0	0	0	0
Functioning hours (h)	0	0	0	0	0	0	0	0
Delivered energy (GWh)	0	0	0	0	0	0	0	0
Energy output (GWh)	0	0	0	0	0	0	0	0
<b>Unit 3</b>								
Installed power (MW)	330	330	330	330	330	330	330	330



	2003	2004	2005	2006	2007	2008	2009	2010
Available power (MW)	310	310	310	310	0	0	315	323
Functioning hours (h)	4102	5000	5000	5500	0	0	3500	6500
Delivered energy (GWh)	1087	1334	1330	1510	0	0	975	1907
Energy output (GWh)	1168	1430	1430	1620	0	0	1050	2050
<b>Unit 4</b>								
Installed power (MW)	330	330	330	330	330	330	330	330
Available power (MW)	315	323	323	323	323	323	323	323
Functioning hours (h)	6868	6500	6500	6500	6700	6500	6500	6500
Delivered energy (GWh)	1896	1795	1810	1840	1925	1870	1870	1907
Energy output (GWh)	2032	1924	1940	1980	2070	2015	2015	2050
<b>Unit 5</b>								
Installed power (MW)	330	330	330	330	330	330	330	330
Available power (MW)	0	0	315	323	323	323	323	323
Functioning hours (h)	0	0	3500	6500	6800	6500	6500	6500
Delivered energy (GWh)	0	0	970	1840	1950	1870	1870	1907
Energy output (GWh)	0	0	1040	1980	2100	2015	2015	2050
<b>Unit 6</b>								
Installed power (MW)	330	330	330	330	330	330	330	330
Available power (MW)	304	290	0	0	315	323	323	323
Functioning hours (h)	3681	3682	0	0	5000	6500	6500	6500
Delivered energy (GWh)	940	942	0	0	1400	1870	1900	1907
Energy output (GWh)	1016	1010	0	0	1510	2015	2045	2050
<b>Unit 7</b>								
Installed power (MW)	330	330	330	330	330	330	330	0
Available power (MW)	305	305	310	310	310	310	310	0
Functioning hours (h)	4258	4500	5300	5500	5500	5500	2000	0



	2003	2004	2005	2006	2007	2008	2009	2010
Delivered energy (GWh)	1085	1175	1400	1510	1510	1470	534	0
Energy output (GWh)	1170	1260	1510	1620	1620	1580	575	0
<b>TOTAL PLANT</b>								
Installed power (MW)	1980	1980	1980	1650	1650	1650	1650	1320
Available power (MW)	1544	1538	1568	1266	1271	1279	1594	1292
Delivered energy (GWh)	6307	6586	6700	6700	6785	7080	7149	7628
Energy output (GWh)	6786	7059	7200	7200	7300	7625	7700	8200

The plant currently has 1,312 employees, out of which 159 with college & university education, 1140 high school graduates and 13 low-skilled workers. These figures have been reached after several successive lay-offs and after spinning-off the repair entity, organized today as a subsidiary of Termoelectrica S.A. (TERMOSEV Turceni)

Turceni plays an important role in the Romania's power balance. During summer 2003, when a serious drought led to a decrease in nuclear electricity output (because of not enough cooling water in the Danube) and to a decline of hydro electricity outputs (run-of-the-river Hydro Power Plants like the Iron Gates were affected by the lowest Danube water level in the last 160 years), the lignite-fired generation of Turceni and Rovinari helped cover a load that increased dramatically due to the demands of air conditioning. Turceni proved to be crucial for covering the Romanian electricity consumption. Moreover, as Romania has the largest and most stable power system in the Balkan Peninsula (and is synchronously interconnected within the UCTE), it contributed to stabilizing of the entire region, affected as a whole by the high temperatures and serious droughts.

The electricity generated in Turceni is the second low-cost power producer among Romanian's TPPs, after the Rovinari TPP. It is therefore anticipated that the plant will continue to benefit from priority dispatching for two reasons:

- The relatively low cost of generating electricity (the actual regulated price for acquiring its electricity on the wholesale market is approx 43.2 USD/MWh); and
- The dispatching obligation of burning annually a planned quantity of coal. This is one of the most important for TPP features in the Regulation for Planning and Dispatching of the National Power System. It might be relaxed when the sum of must-runs exceeds the level of consumption, but Turceni TPP is still dispatched at the base of the load curve.

**Given the merit order dispatching of the output of Romanian power plants and the perspectives for further cost reduction, the Turceni TPP has excellent chances of being dispatched continuously at an optimum load level.**

The Turceni TPP is strategically placed not only in the center of the lignite mining area, but also on an important grid interconnection node. There is one connection via a 400 kV line to the Iron Gates node that constitutes the interconnection point with Serbia and Montenegro and in general with the former Yugoslavia's power system. A capacity of this system has been heavily restricted by the recent conflicts in the former Yugoslavia, and the efforts of its reconstruction were do not always matching the pace of economic growth of the countries in the region. There are potential export possibilities, as number of electricity traders request offers at the Iron Gates interconnection point.



The power sub-station of Turceni TPP (placed at Tantareni, 3 km SE from the plant) is an important node of the Romanian power system. It underwent recently complete modernization with state of the art technology financed by EBRD – EIB.. It is also connected to Kozloduy, the important node of the Bulgarian power system. There are possibilities for electricity export further to the Balkan Peninsula, with Greece being a traditional customer of electricity from Romania.

Another important role the Turceni TPP is playing is in securing the stability of the whole regional electricity network. Two of its generation units have been modernized in the framework program of the Romanian electricity sector for preparation of interconnection to the UCTE. These units are fully prepared to operate under UCTE rules and standards and have been tested on the occasion of the trial operation of the Romanian power system to demonstrate the ability to become an UCTE member. In a situation when a regional electricity market is being developed in the Balkans, with all systems operating based on UCTE standards, the Turceni TPP operators could play an important role on secondary energy markets (like the capacity markets, reserve markets, on a top of the usual physical contracts).

### 2.3. The Associated Coal Mines

The Turceni TPP is supplied with lignite from various coalmines that are located within 15 and 120 kilometers from the power plant.

The Government of Romania has stipulated in the Government Decision 103/2204 regarding the measures for reorganizing of the thermal and electricity energy production base on lignite which mining assets will be bundled into the Turceni Energy Complex. A summary of the coalmines lignite supplies to Turceni TPP in 2004 is presented in Table 2.5 below. The mines bundled with the Turceni TPP are presented in yellow. The indicated exploitations have proven reserves, which will cover a long period of operation of the plant and can almost entirely meet the plant lignite consumption. During 2004 some 120,000t have been supplied from the Anina mine, placed approximately 120 km away from TPP. More details on associated coal mines are provided in Chapter 7.

**Table 2.5: Year 2004 Lignite Quantities CNLO to Supply to Turceni TPP (by coalmine)**

Coalmine	Year 2004 Planned Off-take	Coalmine Annual Production Capacity	Annual Production (as % of Total Capacity)	Coalmine Industrial Reserves
Jilt Sud	3,100,000 t	3,395,000 t	91%	171,672,000 t
Jilt Nord	2,100,000 t	2,425,000 t	87%	127,024,000 t
Pesteană	1,900,000 t	1,900,000 t	100%	44,383,000 t
Rosia	1,350,000 t	3,800,000 t	36%	215,496,000 t
Dragotesti	380,000 t	500,000 t	76%	1,533,000 t
Total	8,830,000 t	12,020,000 t	73%	560,108,000 t

Source: Data Room Information

### 2.4. Railway Infrastructure of the Complex

The Government Decision 103/2204 regarding the measures for reorganizing of the heat and electricity production based on lignite intended to allow for incorporation of the Dragotesti – Turceni railroad into the Turceni Energy Complex. However, as per GEO 12/1998 and GD 27/2004, the Dragotesti-Turceni



railway line is classified as inter-operable railway and may be concessioned only to companies emerging from the reorganization of the former national railway company SNCFR.

### **TURCENI TPP INDUSTRIAL RAILWAYS**

In Turceni TPP the railway tracks have the following structure:

- 2 access lines for the unloading platforms 1- 4 from the steps 1-2, with a maximum declivity of 6‰, 190 m curve's radius, rail type 49, lengths of 933 m and 918 m
- 4 lines for the platforms 1-4 from the steps 1-2, 825 m in length and an available length of the unloading front of 580 m
- 2 tunnel lines split from the platform access lines of 300 m length each
- One exit line from the fronts 1-4 from the steps 1-2, of 488 m length, with access to the station through the 9CED switch point
- 2 service lines, 320 m in length, an access line of 400 m, connecting the entrance line to the platforms from the second step and the exit line to the station through the 1CED switch point, with 320 m in length, a maximum declivity of 6‰, 150 m curve's radius and rail type 49
- One access line to the technical group, split through the 2 bis switch of the "ash" line, with 2600 m in length, with a slope of 4.6% towards the technical group
- 3 lines in the technical group, with a maximum declivity of 2.9% in ramp on a 200 m distance towards the unloading fronts (cargo ramps) from the 3<sup>rd</sup> step, with the following lengths: 1<sup>st</sup> line of 685 m, 2<sup>nd</sup> line of 665 m, 3<sup>rd</sup> line of 675 m
- One connection line between the technical group and the unloading fronts (cargo ramps) from the 3<sup>rd</sup> step, of 935 m length, with a maximum declivity of 5.5% in ramp towards the 3<sup>rd</sup> step platform, 175 m curve's radius and rail type 49
- 2 platforms (cargo ramps) of 700 m length, with an available length of the unloading fronts of 500 m each
- One access line to the defrost tunnel from the 3<sup>rd</sup> step, with a 795 m length and the maximum declivity of 6‰, slope towards the tunnel
- One defrost tunnel line of 645 m length
- The wagon Tripler lines under construction will have the following lengths: line 1 of 415 m, line 2 of 350 m, line 3 of 335 m, line 1A of 410 m, line 2A of 350 m, line 3A of 335 m
- One line for pulling out the empty trains from the unloading fronts from the 3<sup>rd</sup> step, with 2405 m length and a maximum declivity of 7.3‰ slope towards the Turceni station
- Other lines, with a maximum declivity of 3‰, 150 m curve's radius, rail type 40, with the following lengths:
  - Materials warehouse line of 110 m
  - Turbines hall line of 252 m
  - Transformers access line of 299 m
  - Chemical treatment line of 248 m
  - Crude oil line 1 and 2, each one of 366m and an available length of the unloading front of 170 m
  - 82 m line of the locomotives' hangar.



The railway tracks allow a maximum axle load of 20.5 t/axle and the use of all locomotive series.

The maximum allowed speed for the entrance of the maneuver conveys to the unloading fronts in the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> step and in the technical group is 40 km/h and on the other maneuver lines is 30 km/h.

#### **List of Assets:**

- Electrical Diesel locomotive 2100CP, DA type – 5 units;
- Locomotive hangar – 1 unit;
- Administrative unit – 1 unit;
- Material warehouse – 2 units;
- Switchmen's cabin – 2 units;
- Railway tracks – 46 km;
- Railway bridge – 1 unit;
- Railway walking board – 2 units;
- Switches (crossings) – 51 units.

#### **EMC JILT AND EMS DRAGOTESTI INDUSTRIAL RAILWAYS**

A yard at Jilt Industrial Railway Station (CFU Jilt) has 7 lines dedicated for arriving, departure, assembling and disassembling of trains, with an available length of:

- Line 1 – 425 ml (linear meter), declivity of 3‰;
- Line 2 – 543 ml, declivity of 3‰;
- Line 3 – 875 ml, declivity of 3‰;
- Line 4 – 875 ml, declivity of 3‰;
- Line 5 – 1140 ml, declivity of 3-3.45‰;
- Line 6, 7 – 1270 ml, declivity of 3-7.8‰.

Connected from lines 6, 7 of CFU Jilt, with a current line of 2000 m, with the following declivities, towards the CFU Jilt station:

- from 0+600 km to 1+100 km – 3‰;
- from 1+100 km to 2+000 km – 7.8‰;
- from 2+000 km to 2+600 km – 2.28‰.

and a minimum curves' radius of 300 m, rail type 49, traffic speed of 15 km/h.

The line from the loading point comprises 2 lines, as follows:

- Line 7A – with an available length of 890m and declivity of 1‰, it is connected to the line 7 of the CFU Jilt, dedicated to car loading at the Jilt Sud loading point;
- Line 6A – with an available length of 886 m and declivity of 1‰, it is connected to the current (again, meaning?) line 6 of the CFU Jilt, dedicated to cargo loading and discharge

#### **Jilt Nord loading point**

Connected from the line 5 of CFU Jilt, with a line of 2480 m, with the following declivities, towards the CFU Jilt station:

- from 3+500 km to 4+200 km – 5.5‰;
- from 4+200 km to 4+700 km – 5.7‰;



- from 4+700 km to 5+700 km – 8.4‰;
- from 5+700 km to 5+830 km – 13‰.

and the minimum curves' radius of 300 m, rail type 49, traffic speed of 5 km/h.

The line from the loading point comprises 2 lines, as follows:

- Line 1 – with an available length of 1100 m and declivity of:
  - from 6+000 km to 6+750 km – 3.1‰ and slope towards CFU Dragotesti;
  - from 6+750 km to 7+200 km – 4.5‰ and slope towards North-West.

It is connected to the current (?) line 5 of the CFU Jilt, dedicated to car loading at the Jilt Nord loading point.

- Line 2 – with an available length of 1200 m and the same declivity as Line 1, it is connected to the current (?) line 5 of the CFU Jilt, dedicated to car loading at the Jilt Nord loading point.

**Dragotesti/Tehomir Loading Point:** It is connected to the second rail track of the CFU Jilt station, with a current (?) line of 540 m length, declivity of 4‰ towards the CFU Dragotesti station, rail type 49, traffic speed of 15 km/h.

Line 7 from the loading point has an available length of 560 m, declivity of 3‰, and it is connected to the second rail track of the CFU Jilt station, dedicated to car loading.

#### THE DRAGOTESTI – TURCENI RAILWAY

In accordance with the GD 103/2004, the railway assets to be included in the Turceni Energy Complex are:

- Turceni-Dragotesti railway track, electro-dynamic centralized, of 29.000m length, on one track with two stations, Turceni and Dragotesti, and one halting place, Borascu;
- 6 maneuver lines, of 750m length each, inside Turceni station, i.e. lines 8, 9, 10, 11, 12, 13;
- Hangar for locomotives inside Turceni station, including the building and related facilities;
- One electric device for revision (?) of the contact line;
- Borascu halting place, with 2 railway lines of 720m length each, including the related buildings and facilities,
- Dragotesti station, with 7 lines of 750m each, including the related buildings and facilities,
- FALS railway cars - 520 units;
- EA-5100 kW electric locomotives- 5 units;
- LDE 2100 CP Diesel electric locomotives - 1 unit;
- Hangar for wagons inside Turceni station, including 2 lines dedicated to wagons' repairs, compressing station and other facilities.



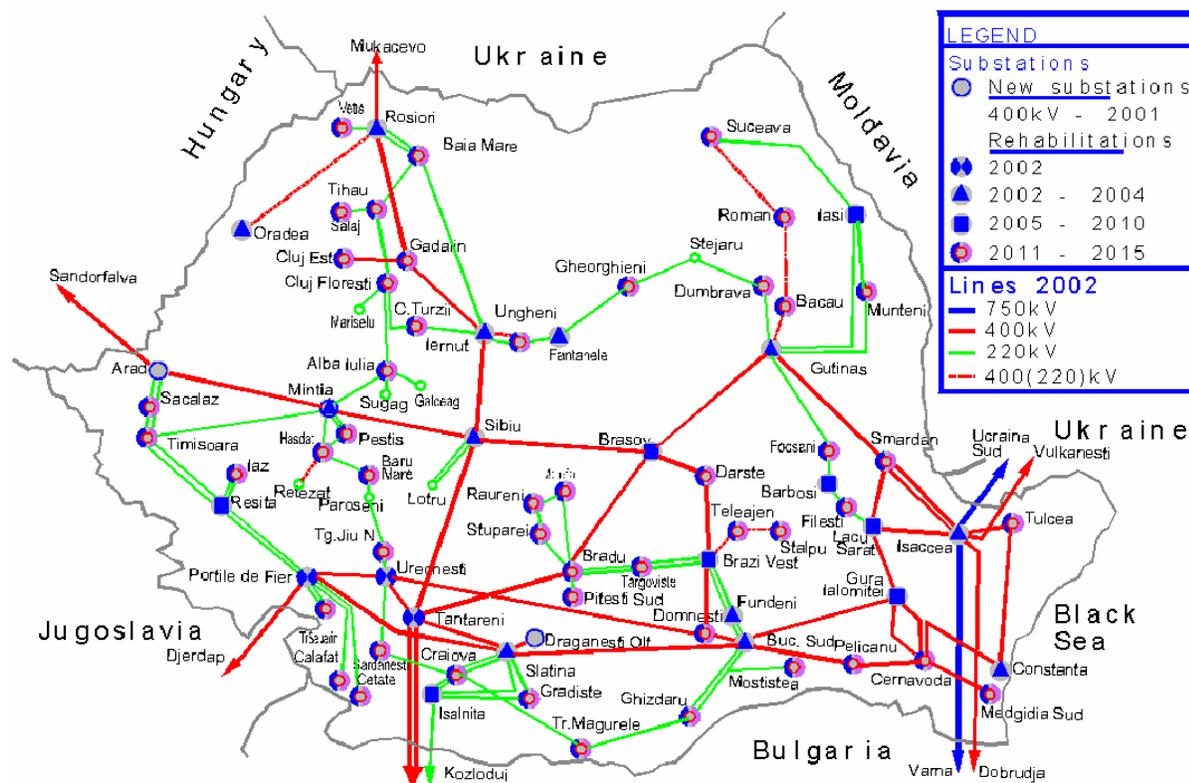


### 3.0. ROMANIAN POLITICAL AND ECONOMIC BACKGROUND

#### 3.1. Location

Romania is one of the largest countries in the Central European region (about 22 million inhabitants), located on the Western shore of the Black Sea, in Southeast Europe and covering an area of over 238,000 sq km.. Romania’s neighbours are Hungary, Ukraine, Moldova, Bulgaria, and the State of Serbia and Montenegro, with the Black Sea to the Southeast. The capital city is Bucharest, with a population of over 2 million.

**Figure 3.1: Romanian High Voltage Transmission Grid – Turceni TPP Power Evacuated via Tantareni High Voltage Substation (South West of Romania)**



Approximately 8,800 km of overhead lines (OHL) currently exist.

154.4 km of 750 kV	4,134 km of 220 kV
4,474.2 km of 400 kV	38 km of 110 kV

Transelectrica operates 76 transforming and/or interconnection substations in Romania.

1 of 750 kV	49 of 220 kV
26 of 400 kV	

The total transmission capacity is roughly of 22,000 MW.

Source: Transelectrica SA., 2nd Black Sea Energy Summit, Bucharest, 22-23 September 2003



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### 3.2. Population

According to the Census of March 2002, Romania's population was of about 22 million inhabitants, with an average density of 91 inhabitants per square km. Of the total population, 91% are ethnic Romanians, other major minorities including Hungarians, Roma, German and Ukrainian. Also, the last census revealed that 52.7% of the total population lives in the urban areas and that Romania's population is relatively young, with an average age of 34.6 years as of 2000.

### 3.3. Resources

The Romanian economy is an industrial – agrarian one. The manufacturing sector, with a diverse industry composition and spread all over the country, includes: metallurgy, steel industry, oil industry, wood & wood processing, shipbuilding, textile, leather, food processing. Industrial production was sharply reduced after 1989, because of a collapse of the political and economic system that was followed by the restructuring delays and insufficient investment.

The agriculture is lacking modern machines and equipment and fertilizers. There is a very wide and costly to maintain an irrigation network. The major crops are: wheat, corn, sugar beet, potatoes, sunflower, industrial plants, tobacco, grapes for wine and consumption. The animal production has been declined because of collapse of collective farming and privatization process that was lacking a firm legislation and capital. The common farm-kept animals are: cattle, sheep, pigs, and poultry.

Romania has a wide range of mineral resources, although in limited quantities: coal (mostly lignite), gold, silver, wood, uranium, and salt (important reserves). Oil and natural gas deposits are not sufficient to satisfy the current domestic consumption. The tourism had a set back after 1989 and is slowly recovering as only recently the seaside hotels has been privatized and an agro-tourism network is being created.

The transport and communication infrastructure, comprising railways (most of them are electrified), roads and commercial maritime fleet, is one of the most deteriorated in Europe. A program for the rehabilitation of the highways is implemented slowly through international collaboration. The most commonly used Romanian airports are: Bucharest (Henri Oanda/Otopeni) International and Banesa; Timisoara, Constanta, Cluj-Napoca etc.

The largest cities are: Constanta (a major port for the Black Sea), Timisoara, Cluj-Napoca, Galati (a major port for the Danube), Brasov, Craiova, Ploiesti, Iasi, Oradea, Arad, Tg. Mures, etc. University centers are in Iasi (1860), Bucharest (1864), Cluj-Napoca, Timisoara, Craiova, and Brasov.

The total coal reserves of Romania amount to approximately 1 Gt of hard coal and 3 Gt of brown coal and lignite and are sufficient to cover power generation needs for 70 years. More than 90% of the Romanian coal reserves are in Oltenia Region, which is located between the river Olt and the Danube. This basin includes the lignite deposits of Rovinari, Motru, Jilt, Berbesti-Alunu and Mehedinti. More than 80% of Romanian lignite reserves can be mined profitably in open-pit mining, while the remaining 20% require underground mining.

Coal deposits are of low quality; lignite has only 1400 – 1800 kcal/kg; hard coal contains about 3000 – 4000 kcal/kg. The average humidity varies from 42% in lignite to 10% for pit coal. The average sulphur content is 0.8 – 1.2% for lignite and 2% for pit coal. Practically all produced coal (ca 97 percent of total coal produced) is used for power generation.

### 3.4. Political Life

Romania is a constitutional democracy. Parliamentary elections are held every four years. A president is elected every five years. Mr. Traian Basescu is the current President, as of December 2004. The last



parliamentary elections were held in November 2004. A ruling coalition the Alliance has nominated its first cabinet led by Prime-Minister Calin Popescu Tariceanu.

### 3.5. Macroeconomy

Since 2001, Romania has experienced consecutive years of economic growth, registering one of the highest rates of growth among the European Union candidate states. This positive trend is expected to continue, as the country pursues structural economic reforms targeting integration into the European Union by 2007. During 2001-2002, the strong economic growth was combined with reduced inflation and current account deficit reduction, thus setting a platform for medium-term economic growth sustainability. Table 3.1 summarises some historical and forecast (for the years up to the expected EU integration) key macroeconomic indicators.

**Table 3.1: Romania's Key Macroeconomic Indicators**

	2002	2003	2004	2005f	2006f
GDP Growth	4.9	4.9	8.3	8.0	6.0
Industrial Output Growth (% end period)	8.6	5.9	5.3	6.8	7.5
Exports (bn US\$)	13.9	17.6	21.3	27.1	28.6
Imports (bn US\$)	16.5	22.2	24.0	31.8	32.7
Trade Balance (bn US\$)	-2.6	-4.5	-5.4	-4.7	-4.2
Foreign Reserves (bn US\$, end period)	7.2	9.0	10.5	10.5	11.3
External Debt (% GDP)	33.2	33.2	33.9	32.1	30.4
Exchange Rate ROL/Euro (end period)	34,919	38,674	36,825	33,600	33,200

*Source: NIS, NBR, IMF, BMI with recent updates*

Following the upward trend of the Romanian economy, Moody's, Fitch, Standard and Poor, Japanese Credit Rating Agency have all gradually upgraded Romania's credit ratings, based on the strong macroeconomic performance, improved bond market access, solid international reserves, and reduced government debt burden. The table below provides an overview of Romania's current credit rating by the main international rating agencies.

**Table 3.2: Rating of Romania**

Rating Agency	Foreign Currency Bonds & Notes	Foreign Currency Deposits	L/T Local Currency Sovereign Rights	S/T Foreign Currency	S/T Local Currency
Moody's	Ba3 Stable	B1 Stable	-	-	B1 Stable
Standard & Poor's	BB + Positive	-	BBB - Positive	B Positive	A - 3
Fitch	BB Positive	-	BB + Positive	B	B
Japan Credit Rating Agency	BB	-	-	-	-

Rating agency Moody's had upgraded in 2004 Romania's foreign currency LT debt rating to Ba3 from B1. The government's domestic currency bond rating had also been raised to Ba3. The outlook on all ratings is stable. Moody's said that the upgrade primarily reflects the fact that Romania's resilience to external shocks has strengthened over the past few years.



On September 14, 2004, Standard & Poor's raised Romania's long-term foreign currency sovereign credit rating to 'BB+' from 'BB'. At the same time, the long- and short-term local currency sovereign credit ratings were raised to 'BBB-' and 'A-3', from 'BB+' and 'B', respectively. The outlook is positive.

Rating agency Fitch has upgraded Romania's LT foreign and local currency ratings to BB from BB- and to BB+ from BB, respectively. The outlook on the long-term ratings is positive. The ST foreign currency rating remains unchanged at B. Fitch says that the upgrade primarily reflects consistent macroeconomic policies that have supported sustained economic growth, gradual decline of inflation and a reduction in the ratio of public debt to GDP.

Strengthening the external current account balance, further reducing inflation and sustaining rapid GDP growth against the background of an accelerated wide-ranging structural reform, aim to prepare the economy for EU accession in 2007.

Romania has become one of Eastern Europe's attractive countries for investment, as has been demonstrated by the progress being made towards European Union accession and attracting more foreign direct investments.

### FOREIGN DIRECT INVESTMENT (FDI)

FDI inflows increased sharply following the election of the center-right government in 1996. During the period 1998-2002, total FDI amounted to USD 6.3 billion. Most of the foreign investment in Romania came from Italy, France, Germany, South Korea, the Netherlands and the US. But in 2004 alone FDI volume was USD 4.2 billion and Austria took a lead among investors' countries

In 2004, the sale of Petrom, two distributors of natural gas (Distrigaz Nord and Distrigaz Sud), and four electricity distributors (Electrica Banat, Dobrogea, Oltenia and Moldova) was completed. In the forthcoming months, the privatization process for another electricity distributor (Muntenia Sud) is expected to be completed. A similar process is envisaged for the three newly created energy complexes, Turceni, Rovinari and Craiova, scheduled for starting the privatization process in 2005. The privatizations in the energy sector are anticipated to attract large foreign investments.

### INVESTMENT AND TAX TERMS

The Romanian government has direct investment legislation (Emergency Ordinance 92/1997) that encourages investments by offering equal opportunity for all investors, domestic or foreign. Tax incentives were largely abolished in 2000, but are still available for investments in free trade zones, disfavored zones and industrial parks, and small and medium sized enterprises. The tax regime is being conformed to EU guidelines in preparation for EU accession. The specific tax rates are outlined in Table 3.3, below.

**Table 3.3: Romania's Corporate and Sales Tax Rates**

Year 2004	
Corporate Income Tax	16 / 3*
Capital Gains Tax	16
Withholding Tax	Min 5%
Dividends	10
Interest	1
Trade Commissions	16
Commissions	16
Value Added Tax	19



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*\* Special case –the micro-enterprises that are taxed according to the turnover.*

*Source: Government of Romania*

The Ministry of Finance approved new accounting regulations in 2001 (Order 94/2001) which seek to harmonize the domestic accounting rules with the EEC 4<sup>th</sup> Directive and the International Financial Reporting Standards such that by the year 2006 all major companies should apply the IFRS rules in their accounting standards.

Foreign exchange controls are in the process of being liberalized to a fully open market. Currently, the currency market is a free market, although the reasons for purchases of foreign currency must be disclosed. According to the Emergency Ordinance 92/1997, foreign investors may transfer to their countries benefits, dividends, proceeds from sales of shares, and proceeds from liquidations.

### **PRIVATISATION LEGISLATION AND METHODS**

The legal background of the privatization process has been continuously improving to reach internationally acceptable standards in terms of transparency of procedures, fair and equal treatment of investors, customary representations and warranties for investment and property, and environmental obligations. The current legislation on privatization consists of Emergency Government Ordinance No. 88/1997, as amended, Law No. 137/2002, as amended, Government Decision No. 577/2002, as amended, which was approving the Methodological Standards for the application of these pieces of legislation.

The current legal framework provides for flexibility in structuring the privatization transaction in a way that meets the specific needs of investors. There are specific legal provisions allowing for transparent, non-binding negotiations of the framework contracts and agreements defining the transaction prior to submitting the final bids. Substantial investors' due diligence and full disclosure of relevant information are also specifically provided by law to support decision-making and substantiate the final offers.

Further flexibility is provided by law in terms of structuring the financial side of the transaction by allowing a combination of: (i) sales of shares owned by the state with (ii) an up-front capital increase which would secure at least 51% share-control by the investor and (iii) followed by later equity or debt investments. Various facilities allow the privatized companies to restructure debt to the state budget.

In terms of risk mitigation, the privatization legislation obliges the Ministry of Finance to issue fiscal obligation certificates for the company being privatized and the Environmental Authority to define the current and future obligations of the company. There are special provisions for companies in the utilities sector that allow for the whole transaction to be approved by Government Decision, reducing substantially third party associated risk.

## **3.6. Foreign Relations**

### **NATO MEMBERSHIP**

The Government was successful in reaching its major foreign policy objective of seeking integration into Euro-Atlantic alliances. NATO invited Romania to open membership discussions at its summit meeting in Prague in November 2002. In March 2003, Romania signed an accession protocol and formally became a NATO member in May 2004, subject to ratification of the protocol by the national parliaments of the current nineteen NATO members and future members.



## EU MEMBERSHIP

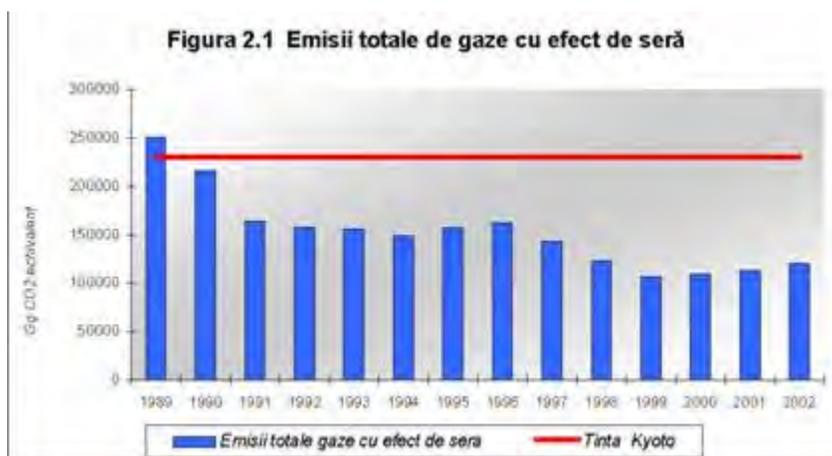
On 1 February 1993, Romania signed an Association Agreement with the EU, and on 22 June 1995 submitted its official application to join the EU. The government was invited to open membership negotiations with the EU in December 1999 at the European Council Summit in Helsinki. Thereafter, at the summit of the EU in Copenhagen on 20 November 2002, the target date of 1 January 2007 for its entry into the EU was incorporated in the report on enlargement passed by the European Parliament. The summit provided a “roadmap” to membership and increased pre-accession funding. This is an important achievement for meeting the accession targets: completion of the accession negotiations by the end of 2004, signing the Treaty of Accession in April 2005 and joining the EU in 2007.

## ROMANIA AND THE KYOTO PROTOCOL

Romania is an Annex 1 country to the Kyoto protocol and has committed to reduce by 2008 its total level of GHG emissions by 8% as compared to the 1989 (the reference year) level. Romania has created a provisional mechanism for approving Joint Implementation Projects and has signed protocols in this respect with The Netherlands, Austria, Switzerland, Denmark, Sweden, Norway and Japan. A similar cooperation has been started with the PCC (Prototype Carbon Fund) developed by the World Bank. Romania was the first country to ratify the Kyoto protocol, by Law 3 / 2001.

The evolution of the Greenhouse Gas Emissions Level in Romania can be described by the following graph published in the MWEP report “Environmental status 2003” (source: [www.mappm.ro](http://www.mappm.ro))

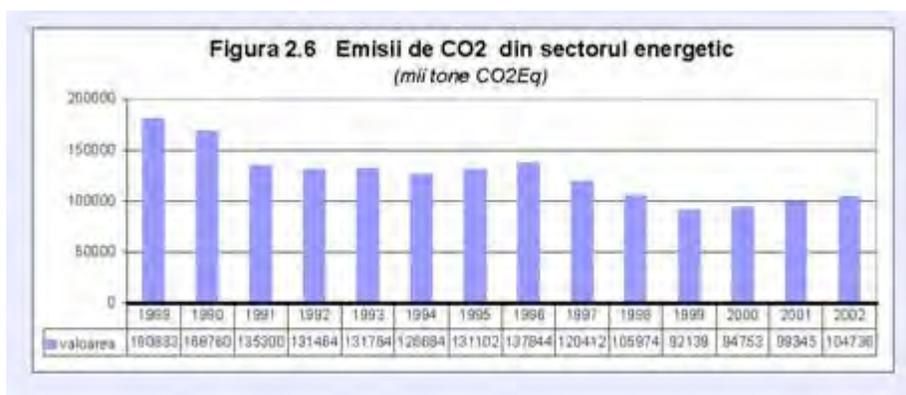
**Figure 3.2: Total Annual GHG Emissions in Romania, Versus the Kyoto Target for Romania**



Source: MWEP report “Environment status in 2003”



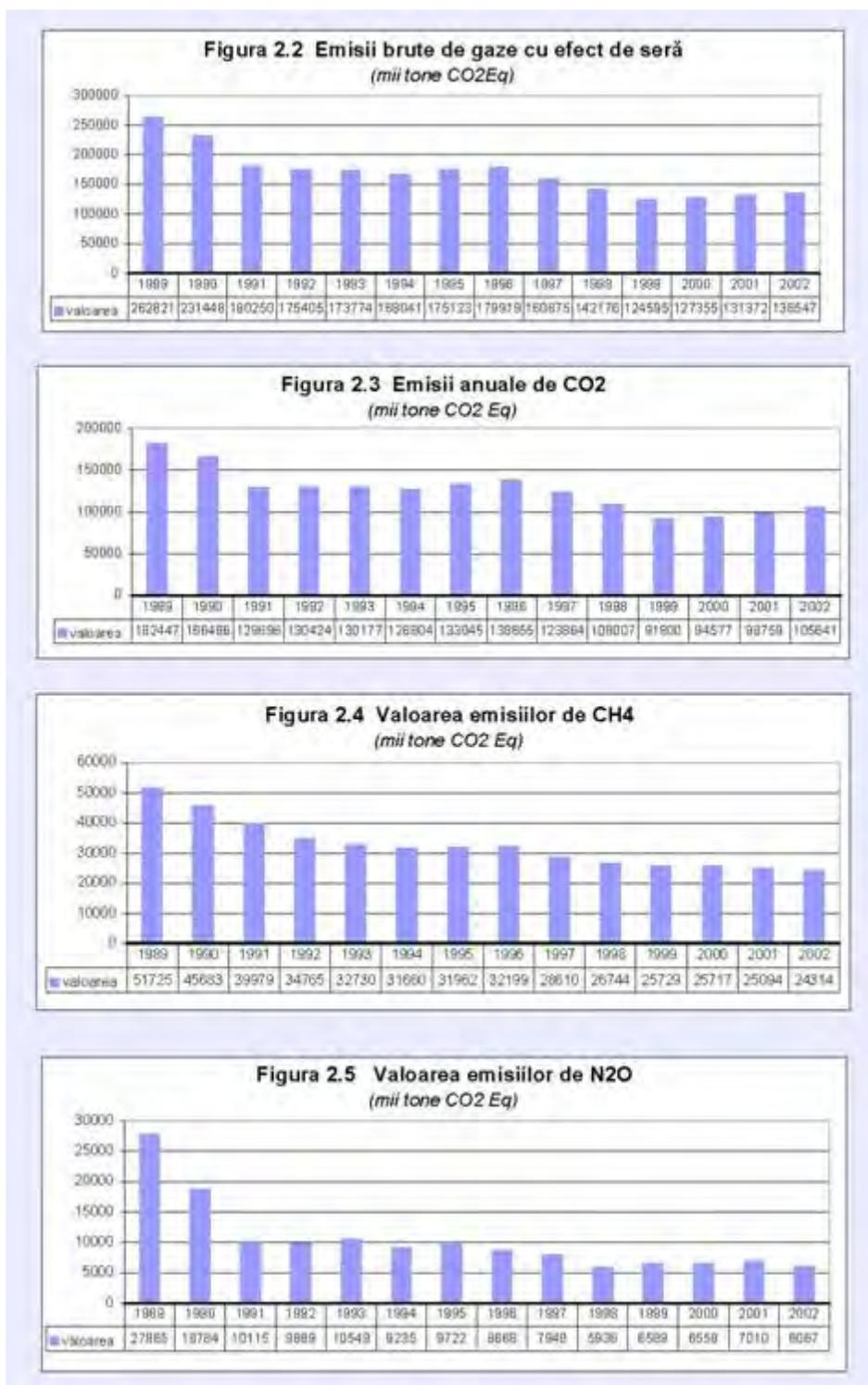
Figure 3.3: Annual CO2 Emissions in the Energy Sector



Source: MWEP report "Environment status in 2003"



Figure 3.4: Gross Emissions of Greenhouse Gases, Annual CO2 Emissions, Annual Methane Emissions, Annual N2O Emissions in Romania



Source MWEP report "Environment status in 2003"



### 3.7. Romanian Government Roadmap for the Energy Sector

In July 2003, the Romanian Government adopted the Roadmap for the Energy Sector, as a reply to the European Commission Roadmap for Bulgaria and Romania’s accession to the EU, elaborated after the Copenhagen EU summit in December 2002. The document has been published in July 2003.

As this document contains a large quantity of crucial information for the governmental intentions regarding the medium and long-term development of the energy sector in Romania, a lecture of the entire document, available both in Romanian and English on [www.minind.ro](http://www.minind.ro), is recommended.

#### THE NEED FOR ENERGY SECTOR DEVELOPMENT

The basic evaluation of energy development needs is based on anticipated consumption. The consumption projections done are defined by following factors:

- To sustain the socio-economic developing trend of the country,
- To improve the energy efficiency, environment protection, and the optimal use of resources.

Consequently, the consumption projection done is based on following components.

1. **GDP growth.** The Romanian Government policy is to sustain an accelerated growth of the GDP in view of achieving the strategic objective of reduction of the income gap between Romania and the EU countries. Two scenarios of GDP growth were basically considered for the period till the year 2015:

**Table 3.4: Scenarios for GDP Growth**

GDP growth in %	Achieved in 2000 – 2001	2002 – 2005	2006 – 2010	2011 – 2015	Average value 2002 - 2015
Base Scenario	5.2%	5.1%	6.0%	5.2%	5.46%
Alternative Scenario		4.4%	5.5%	4.8%	4.90%

*Source: The Roadmap for the Energy Sector*

**The base scenario** is the one the Government envisages to implement, based on the accelerated development of the economy, where industry development has a key role, as well as acceleration of the privatization in the electricity, gas and oil sectors, and the accomplishment of the privatization in other sectors of the national economy.

**The alternative scenario** has been considered having in view the possible negative impact of the worldwide economy trend on the Romanian market, which could slow down some economic processes.

#### ENERGY INTENSITY

**In the base scenario** as provided in the strategy for energy efficiency, the overall energy intensity has to be reduced by 30-50% till the year 2015, in a complex process which involves replacing of high-energy consumption technologies in a structural adjustment of the economy.

**The alternative scenario**, providing for a 25% reduction of the energy intensity, is related to the alternative scenario of the GDP growth, i.e. a slower development due to some unexpected effects.

Energy intensity measured as an amount of primary energy sources per GDP unit (a ton of oil equivalent to US \$ 1,000) is one of the key measures of energy efficiency and an important component of any



national economy, which has been considered in the energy planning. Energy intensity in Romania measured by this indicator is as follows:

**Table 3.5: Energy Intensity, in t.o.e. / \$ 1,000 of GDP**

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Romania:											
a)	1,33	1,21	1,06	1,07	1,02	0,92	0,88	0,89	0,99	0,96	0,83
b)	0,66	0,61	0,53	0,41	0,39	0,35	0,34	0,34	0,38		
UE	0,19	0,19	0,19	0,18	0,19	0,18	0,19	0,18	0,17	0,16	0,15

*For Romania: - Source of information ISPE (Institute for Energetic Studies and Engineering)*

a) Final energy consumption/GDP1997

b) Final energy consumption/GDP - parity purchase power (ppp)

\*\* - year 1989 has been calculated at the same ppc as in 1990;

- For the years 1998 - 1999 b) indicator has not been calculated due to the lack of ppp measure

The 3% drop in energy intensity is mainly due to the structural change of GDP i.e.:

- Drop of industry share in GDP from 40.5% in 1990 to 33.2% in 1996 and to 25.23% in 2000
- Increase of the share of services sector.

Specific targets to reduce emissions and energy intensity are included in the strategy for energy efficiency. Assumed changes in energy intensity are important for this road map from the point of view of their impact on the determination of the power demand.

In the strategy for energy the following prognosis for energy intensity is foreseen:

**Table 3.6: Energy Intensity During 2000 – 2015**

Indicator	MU	Scenario	Year			
			2000	2005	2010	2015
Final energy consumption/GDP	t.o.e./10 <sup>3</sup> \$	Optimistic	-	0.522	0.409	0.334
		Optimistic – moderate	-	0.522	0.426	0.352
		Medium	0.835	0.533	0.456	0.410
		Medium – pessimistic	-	0.547	0.482	0.434
		Minimal	-	0.557	0.499	0.451

*Source: ISPE. The year 1999 has been considered as base year*



## POPULATION

Population is increasing energy consumption by using more house appliances. The population of Romania is foreseen to reach 22.2 to 22.3 million inhabitants in the year 2007 and 22.6 million in the year 2015.

Based on the objectives of: GDP growth, Reduction of the energy intensity by 30-50%, and Population energy demand, the following projection of needs for **energy resources for Romania** was developed:

**Table 3.7: Needs for Primary Energy Resources  
toe /1000\$ of GDP (tons of oil equivalent)**

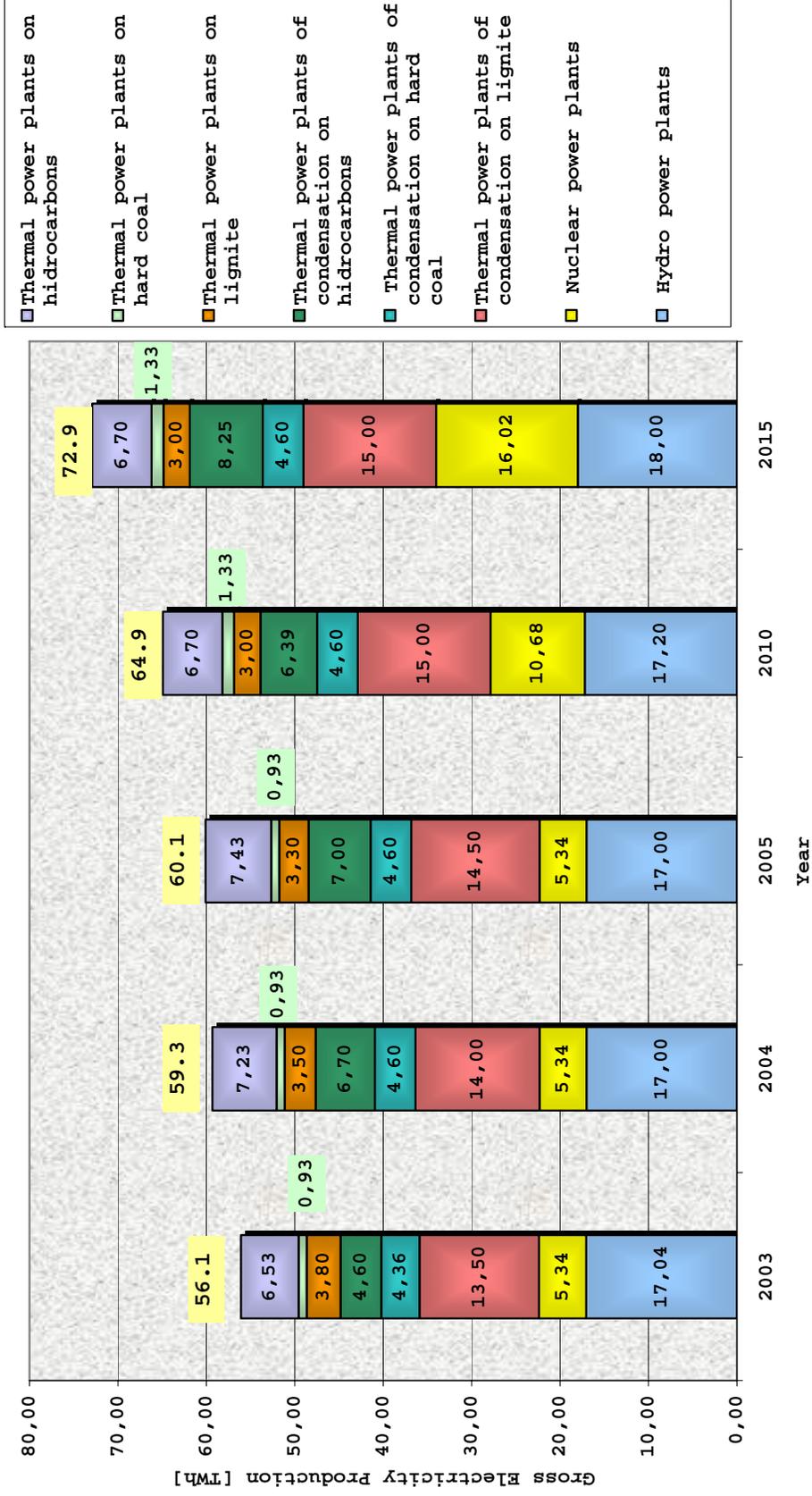
	Achieved 2001	2005	2010	2015	Increase 2015 / 2001
Reduction of energy intensity					
a) 50%	54.260	54.000	54.700	57.300	3000
b) 40%		57.770	63.800	68.500	14.200
c) 30%		58.300	66.900	74.500	20.200

Having in view the Strategy of Energy Efficiency the alternative of 40% reduction in energy intensity is considered a realistic achievable target.

Due to a more efficient energy use the average electricity consumption growth is 2.7%/year vs. GDP rate of growth 4-5%/year.



GROSS ELECTRICITY PRODUCTION STRUCTURE IN THE 2003-2015 PERIOD





## SECURING THE ENERGY RESOURCES

The basic criteria used in the projections for use of the energy resources, was the cost of energy. Some other auxiliary criteria have also been considered, such as:

- Security of supply by maximum use of the domestic energy resources available in the country, while responding to the need of cost efficiency;
- The need to import energy resources, but in a more diversified structure to secure competitive access to the energy resources.

Based on these criteria, the following domestic energy resources were identified in the strategy:

1. **LIGNITE:** Availability of domestic lignite reserves for the next 50 to 70 year at a production rate of 30-35 million tons/year in open pit mining exploitations. The mining strategy provides that the production of lignite is going to be concentrated in the most cost efficient exploitations, which are the open pits, and the unviable mining operation (mainly underground) will be closed. The lignite production in Romania is not subsidized, and represents a competitive source of energy, not influenced by the market tendency of rapid price increase of other fuels.
2. **HARD COAL:** Long-term availability of domestic hard coal is secured at a production rate of 3.5 million tons/year;
3. **NATURAL GAS:** Domestic natural gas production will register a sharp decrease due to limited natural reserves. Consequently the dependency on gas imports will be increased as follows:

**Table 3.8: Overall Consumption of Natural Gas in Romania in the Period 2003 – 2015**

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Consumption (bill. c.m.)	18.3	18.3	18.4	18.8	19.2	19.6	20	20.4	20.8	21.2	21.6	22	22.4
Domestic sources (bill. c.m.)	12.7	12.5	11.5	10.9	10.4	10.1	9.8	9.5	9.2	8.9	8.6	8.3	8
Import sources (bill. C.m.)	5.6	5.8	6.9	7.9	8.8	9.5	10.2	10.9	11.6	12.3	13	13.7	14.4
Import in yearly consumption (%)	30.6	31.7	37.5	42	45.8	48.5	51	53.4	55.8	58	60.2	62.3	64.3

*Source: National Regulatory Authority in Natural Gas Sector, Bucharest 2003*

4. **HYDRO POWER:** Using most the available hydropower reserves so that the annual hydro energy production will increased by 1.5-2.5 GWh thanks to installation of additional power generation capacities of about 500-900MW.
5. **NUCLEAR ENERGY:** Nuclear energy program will be continued by putting into operation of Cernavoda Nuclear Power Plant Unit nr. 2 in 2006 and at a later date Unit nr. 3.
6. **RENEWABLE ENERGY:** Renewable energy sources should be encouraged as provided in the national program for renewable energy sources; this represents a local source that can help reduce reliance on imports and improves the security of energy supply, meeting the environment protection criteria. The renewable energy sources (biomass, hydropower plants, geothermal energy, etc.) represent an important resource. However the high cost of initial investments represents a limiting factor to their expansion so that in order to overcome this obstacle a special incentive program should be enforced including a financial and/or a financing component.



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## CONCLUSION

The following conclusion can be derived for the year 2015:

- The domestic energy resources will be limited at 24-25 million toe/year.
- By operating the coal fired plants at a constant supply rate of 30-35 million tons of lignite/year and 3.5 million tons of hard coal/year additional electricity generation needs will be covered from increased the nuclear energy and hydro generation.
- Even so the need of import of energy resources will increase from 33.6% in 2001 to 39-40% in 2005 and 49-50% in the year 2015. In this respect the need of imports of natural gas will increase from 18.4% in 2001 to 64.3% in the year 2015.

Having in view the trend of increasing share of imported energy sources, the Energy Strategy of Romania has been based on making strenuous efforts in two key areas:

- Reduction in energy intensity per GDP unit in the economy;
- Increased use of renewable energy sources.

Additionally, dealing with cross-border transactions involving one or more countries would require a degree of harmonization of the tariff-setting and capacity allocation. Along with that, a significant effort should be done to improve the security of supply of the energy resources from imports, by increasing their availability, through consistent long term international arrangements and agreements, as wells as by diversification of energy sources, using Romania's key geographic location for the transit of energy resources (natural gas, and oil) located in the eastern part of the country.

## ENERGY MARKET MODEL IN ROMANIA

**The Strategy for Energy Sector and Energy Efficiency in Romania** is based on setting up long - term objectives reflecting the needs of the National Economy for:

- Reliability and security of sufficient energy supplies
- Energy efficiency
- Use of renewable energy sources
- Environment protection.

In order to reach these objectives in line with the “acquis communautaire”, the energy structure and energy market model is undergoing a rapid transformation towards a fully liberalized and competitive wholesale market.

The **competitive market** consists on:

- Bilateral, freely negotiated contracts between internal producers and eligible consumers or with other suppliers who will sell electricity to eligible consumers. Eligibility will be increased step by step till the full opening of the market. On the open market, eligible consumers, power suppliers and even the distribution companies have the opportunity to trade electricity by direct and free negotiation or by placing them on the spot market
- Negotiated contracts concluded by producers and self-producers with distribution and supply companies
- Transaction on the day-ahead market
- Export contracts, directly negotiated by the producer with the outside customers



- For the network use, Romania has implemented the regulated third party access both for transmission and distribution, and related tariffs were published.

Both the existing and the new participants on the electricity market are equally treated on a transparent and non-discriminatory basis, which also includes the regulated access to the transmission and distribution networks. In this respect, connection to the grid is a compulsory public service.

At present, the Romanian Wholesale Electricity Market (REM) is encompassing two parts:

- A competitive market
- A regulated market.

The role of the regulated market is to assure adequate transactions between producers and suppliers of captive consumers, corresponding to the final consumption of the captive consumers. Prices on this regulated market are established in order to cover costs and to include a reasonable profit. The quantity of electricity transacted on the regulated electricity market is gradually decreased, in line with the market opening and the increase of the competitive market.

On the **regulated market**, electricity is traded on a regulated contract basis (with regulated prices and regulated and usually firm quantities). The contracts concluded on the regulated market are:

- Portfolio contracts of main producers (firm quantities and prices established by the regulator)
- Contracts for electricity produced in cogeneration (quantities and regulated prices)
- Long-term contracts with regulated contracts, the “must run - must take” contract of Nuclearelectrica, concluded for the whole output of the nuclear power plant.

**Considering the length of the contractual arrangements**, REM can be considered as a two-tier market:

- **The first-tier of the market comprises (i)** bilateral (regulated) contracts between producers and D/S licensees; **(ii)** bilateral (freely negotiated) contracts between producers and suppliers/eligible customers. Beginning with 2005 the Initial Contracts and Initial Option Contracts will replace the actual portfolio contracts, and will have declining regulated quantities established according to the market opening (as of 2007 the market will be fully opened). After full opening of the market regulated energy prices will apply only to consumers who are not exercising their right to go on the open market and instead prefer to stick with regulated tariffs.
- **The second-tier the market comprises (i)** Day-ahead transactions which allow producers, suppliers and D/S licensees to adjust their contractual positions previously established in the “first-tier” of the market; **(ii)** Ancillary service transactions between producers and the System Operator (Transelectrica); and **(iii)** Real-time balancing transactions between the System Operator (Transelectrica) and producers and/or suppliers. During 2003-2004, the Market Operator (OPCOM) will design and monitor test run and launch a “Power Exchange” to accommodate all Day-ahead transactions. The regulated production of hydropower will be supplied on a non-discriminatory basis to all D/S licensees and Suppliers through the “Power Exchange” (see Chapter VII hereunder). Also, settlement of physical electricity sale/purchase transactions of the regulated segment of the “first-tier” market and all transaction in the second-tier market will be administered through the “Power Exchange”. When the OPCOM “Power Exchange” will be commercially launched, it will be mandatory for all market participants to handle short-term transactions through this “Power Exchange” facility.

Starting with 2007 and onwards, the volumes in the Initial Contracts will be reduced to a quantity corresponding to the acquisition need of the “Supplier of Last Resort”. A key part of the reason for introducing a market for “capacity tickets” in the OPCOM “Power Exchange” is to facilitate market liberalization by enabling D/S licensees, Suppliers and Producers to adjust the volumes traded in bilateral



contracts while also meeting “Supplier of Last Resort” obligations as well as stabilizing revenues for Producers.

The number of eligible consumers will increase under a pre-set schedule for opening of the market reflecting the requirements of the EU Directive on Electricity. The energy market opening will continue based on the following schedule:

**Table 3.9: Program for Electricity and Natural Gas Market Opening**

	Actual opening on 1.01.2003	Opening on 31.12.2003	Opening on 31.12.2004	Opening on 31.06.2006	Opening on 01.01.2007	Opening on 01.07.2007
Electricity	33%	40% (20 Gwh)	55% (1 Gwh)	80%	100% industrial	100% domestic
Natural Gas	30%	40%	50%	75%	100% industrial	100% domestic

Major features of a competitive, liberalized energy market:

- Transparent, stable and proper operation focus of the regulatory authorities and mechanisms;
- Clear market rules and structures;
- A legal framework adequate to the transparency and stability needs;
- The improvement of the competitive wholesale electricity market which will include the introduction of Initial Contracts (replacing the present portfolio contracts) and the Initial Option Contracts, development of the day-ahead spot market (compulsory in the beginning and later voluntary), opening of an on-the-day balancing market and possible introduction of a capacity-contracting obligation. A set of energy accounting and settlement arrangements will be introduced to support these transactions. The emergence of derivative markets and a more suitable clearing system are envisaged;
- The improvement of competition by maintenance or improvement of the quality of services to customers in terms of security and reliability; and
- The integration of the national power market into a prospective regional market and a further integration in the Internal Electricity Market of the European Union.

## **INVESTMENT AND PRIVATIZATION THROUGH PRIVATE CAPITAL PARTICIPATION AND STRATEGIC INVESTORS**

### **Need of Investments**

In order to upgrade the Romanian national energy system large-scale investments are needed for upgrading, reconstruction, as well as for expansion of the existing capacities and the construction of green field capacities.

Despite of the efforts done in the generation sector, this sector is and will be the most intensive investment sector to cover the target of upgrading and for new projects. It is very significant that for more than 5000 MW generation capacities in the fossil fuel generation, the equipment is very old.

Overall summary picture in the energy sector is the following:

- In the electricity generation sector based on fossil fuels more than 32% of the equipments are older than 30 year, and 50% are between 20-30 years old and only 0. 7% are less than 10 years old. Also in the hydro generation 24% of the equipments are older than 30 years, 51% older than 20 years , and only 13% are older than 10 years



The current state of the generation facilities translates into a threat of not having a sufficient margin of available generating capacity according to UCTE standards. With the present trend of unit retirement and low level of investment Romania may experience a power supply deficit by 2005-2006, as shown in the above figure.

## **STRATEGY APPROACH FOR THE DEVELOPMENT OF THE POWER AND GAS SECTORS**

### **Privatization**

The strategy of the Romanian Government is to accelerate the pace of the privatization processes in the energy sector. The Romanian Government strategy is to privatize:

- All downstream activities in the electricity sector, i.e. the eight electricity and two gas distribution companies;
- Power generation activities starting with the most feasible ones.

At this stage there are no plans for the privatization of the transmission companies (TRANSELECTRICA and TRANSGAZ). However there is a strategy for private access to the new gas fields and there already are private companies operating in new gas production

The consolidation of the appropriate legal and regulatory environment and market structures with stable and transparent rules helps and promotes the privatization process in the energy field. The main goal of the privatization is to get the necessary capital into the company and to strengthen the company rather than maximize the proceeds, so that to have stronger and more competitive companies after privatization in gas and power sector, as well as to avoid unnecessary increase of tariffs.

To this view, use of the revenues generated by privatization in the energy sector is foreseen in order to finance energy projects with a considerable economic and social impact, including related social costs, the targeted support programs for low-income households, and the environmental investments.

That is why the privatization will be based on the following:

- Attraction of the necessary investments for ensuring efficient, secure and environmentally-friendly energy supply; privatization will be pursued mainly by attraction of private capital into equity combined with sale of an additional package of existing company shares;
- Attraction of strategic investors in the utility field who will bring know-how and up-to-date management systems;

### **Environment**

Romania has ratified the UN Framework Convention on Climate Change. In accordance with the signed Kyoto Protocol, Romania has made the commitment to reduce anthropogenic emissions of greenhouse gases by 8% compared to the 1989 emissions level. For the implementation of EU Directive 2001/80/EC, The Romanian Government has prepared a draft of Government Decision for the limitation of the emissions in the atmosphere from large combustion plants, i.e. over 50 MW, at the level of the EU Directives (for solid, SO<sub>2</sub> and NO<sub>x</sub> emissions). These limits are compulsory for implementation in any new unit.

For the existing units in operation it is foreseen that they will gradually reach the required level of emission by investment program so that by the year 2010-2012 (depending on plant) the requirements of the level of emission provided in the new regulation will be satisfied.



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### **Regional Electricity Market**

Romania should play an important role in the South-Eastern Europe Electricity Market and, along with other countries of the region, should ensure the balance of capacities in the second synchronous zone. The evolvement of contractual relations should lead to the establishment of a regional energy market of the countries in the region in the context of the Regional Electricity Market initiative (Albania, Bosnia-and-Herzegovina, Bulgaria, Greece, Macedonia, Romania, Serbia, Montenegro, and Turkey).

The regional market, in which Romania may play an important role, represents a significant step for further integration within the EU energy market, and is expected to provide better opportunities for free trade and for marketing. In this respect, it is worthwhile to mention the initiative of Romania to set up a national/regional power exchange in Bucharest with still pending negotiations.



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## 4.0. ROMANIAN LEGAL AND REGULATORY FRAMEWORK

### 4.1. Legal and Regulatory Framework Review – Power Sector

Activities of the Romanian power sector are governed by a complex legislative and regulatory framework comprising primary legislation (such as laws, governmental decisions and governmental emergency ordinances), as well as secondary legislation (such as commercial, metering, transmission and distribution codes, and regulations and licenses issued by the electricity regulator, environmental agencies and other regulatory and administrative bodies).

#### KEY INSTITUTIONS

##### Strategy Institutions

###### *Ministry of Economy and Commerce*

The Ministry of Economy and Commerce (MEC) is a specialized body of the central public administration, with a status of legal entity, subordinated to the Government. It represents the State authority in the broad area of economic growth, industry and energy, mineral resources, commerce, European integration and international relations. It was established in 2003 by reorganization of the Ministry of Industry and Resources. Overall organizational structure, a comprehensive list of responsibility areas and functions of the Ministry are given in Government Decision 738/2003. Detailed information on it is available on the MEC website ([www.minind.ro](http://www.minind.ro))

Oversight and supervisory responsibilities and specific functions and tasks of the Ministry over the energy sector and in development and implementation of the national energy policy are in accordance with the Energy Law No. 318/2003. The Ministry key tasks, as defined by this law, are drawing up programs and action plans in order to implement the Government's policy for the electricity sector, including programs for energy efficiency and for promotion of renewable energy source; drawing up normative acts for the electricity sector, Acts as a concession granting authority for the electricity sector; taking steps to building electricity generation capacities that allow the use, under cost efficient conditions, of domestic low quality fuels and the use of pre-established quantities of renewable and unconventional sources; approving mandatory norms and technical prescriptions for the electric power system, etc .

Within the Ministry of Economy and Commerce, the Office of State Ownership and Privatization in Industry (OPSPI, *Oficiul Participatiilor Statului si Privatizarii in Industrie*) is a public institution with separate legal status, which was set up by Government Emergency Ordinance 88/2001 and approved by Law 552/2001. OPSPI is responsible for implementation of Government privatization strategies of companies in the Ministry portfolio, in mining, oil, gas, power and thermal energy, and defense industries.

##### Regulatory Institutions

###### *Electricity Regulatory Agency ANRE*

The electricity regulatory body, ANRE was set up with the objective to create and implement mandatory regulations for the proper operation of the electricity and thermal energy sectors alongside with ensuring efficiency, competitiveness, and transparency and consumer protection.

In accordance with the Energy Law No. 318/2003, ANRE is responsible for: setting up mandatory regulations for sector companies; issuing, granting, suspending or withdrawing authorizations and



licences for sector companies, including for the producers generating heat in co-generation as well as for sector companies that are likely to emerge as a result of the opening of the electricity market; issue and approve calculation methodologies for prices and tariffs; setting up tariffs for captive consumers and prices and tariffs to be used among sector companies, tariffs for system services, prices and tariffs applied to activities and services related to the generation of heat in co-generation.

ANRE is responsible for setting up framework contracts for electricity supply and framework contracts for electricity selling, purchase, transmission, dispatch and distribution operating among sector companies as well as for the sale of heat produced in co-generation, etc. More details on structure, functions and work program of ANRE can be found in its website ([www.anre.ro](http://www.anre.ro)). Furthermore, ANRE is mandated with issuing authorizations and licenses to all market participants, as well as monitoring the activity of authorized and licensees market participants. Authorizations are issued for greenfield or refurbishment projects of electricity generation sites with an installed capacity of above 10MW for a period determined by the regulator. Licenses are issued for the five activities of electricity market participants, and specifically for: generation, transmission, distribution, supply and electricity

Licenses are issued either for a maximum of 8 years for supply and 25 years for all other activities mentioned above at the discretion of the regulator and may be revoked by ANRE. A brief description of key licenses mentioned above is provided below:

**Transmission License:**

- Valid for 25 years;
- Licensee is responsible for maintaining and upgrading the transmission network as well as for the provision of electricity transmission services;
- Licensee is obliged to ensure non-discriminatory Third Party Access;

**Thermal Power Generation License (available presently to Termoelectrica, Elcen Bucharest, Turceni Energy Complex, Rovinari Energy Complex, Craiova Energy Complex, Electrocentrale Deva, etc):**

- 25 year validity term;
- Licensee has the right to sell electricity both on domestic market as well as for exports, and to provide system services;
- Licensee can directly supply power to consumers based on contractual requirements;
- Licensee must ensure fuel availability.

**Distribution License:**

- 25 year validity term;
- Licensee has to offer distribution services in accordance with the terms and conditions set out in the framework distribution agreement provided by ANRE;

**Supply License:**

- 8 year validity term;
- Licensee has the right to buy and sell electricity to eligible consumers;
- Licensee must provide metering equipment to consumers;
- Licensee must provide information regarding the consumers' electricity consumption;



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## **Market Operator License:**

- 8 year validity term;
- Licensee has the right to undertake all activities necessary for the wholesale electricity market administration;
- Licensee must ensure non-discriminatory treatment of all market participants;
- Licensee must monitor market participants and inform the regulator of any failure to meet existing regulatory requirements;

On the basis of ANRE Decision 11/1999, eligible consumers have the right to switch electricity supplier.

ANRE sets prices and tariffs for generation, transmission, distribution and supply to captive consumers on the basis of justified costs data submitted by market participants to ANRE and calculated according to methodologies approved by the regulator.

## **Non-Discriminatory Operators**

### ***Transmission and System Operator***

#### **Transelectrica**

Transelectrica is the national electricity transmission and dispatch company and, according to the Energy Law No. 318/2003, as well as the Government Decision 627/13.07.2000 and the Technical Code of the Transmission Grid, Transelectrica fulfills multiple functions acting as an electricity market operator, transmission operator (TO) and system operator (SO).

Its main object of activity includes the following: ensure the public electricity transmission service and the electricity transit on the Romanian territory, according to the contracts concluded; examine and endorse the compliance of the electricity transmission network users with the network connection technical conditions, as per the technical regulations in force; coordinate import-export and transit activities; qualify the ancillary services suppliers according to their own procedure that shall be subsequently approved by the competent authority; and operate, retrofit, rehabilitate and develop: equipment in the electricity transmission networks, equipment for the metering of electricity flow in the transmission network and to the interface with the assigned electricity network users, transmission networks IT and telecommunication equipment relating to the National Power System (SEN); etc.

### ***Commercial Operator***

#### **Market Operator OPCOM**

OPCOM, or Commercial (Market) Operator, is a part of Transelectrica's structure, and as the electricity market administrator, is providing an institutional framework for commercial transactions traded within the wholesale power market. In accordance with Government Decision 627/2000 and the Commercial Code of the Wholesale Electricity Market issued by ANRE, OPCOM is responsible for the following activities: setting up of the merit order of the dispatchable units, by ranking them according to their capacity, offered quantities and prices, turned into the operational schedule of the dispatchable units.

OPCOM responsibility is to set up of the system marginal price for each programming interval; publication of the system marginal price and other relevant market information; scheduling of the ancillary services traded daily as a component of the operational programming of the dispatchable units for each programming interval; settlement among market participants, for each settlement interval, of the power and ancillary services quantities traded, of the transmission volumes and market administration



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fees; registration of market participants; contract registration and monitoring, and many others. Additional functional tasks are assigned to OPCOM in accordance with the Energy Law No. 318/2003.

### **System Operator**

According to the Commercial Code, the system operator (SO), a part of Transelectrica Grid Company, coordinates the operation of the production, transmission and distribution installations (at a voltage of 110 kV) together with the market operator based upon the dispatch license.

The system operator carries out regulated operational system services, namely:

- Ensuring safety of system operations
- Ordering loading of groups based upon the set merit order
- Suggesting to the commercial operator ways to change the merit order taking into account system restraints.

System services are contracted from power generators on the basis of system services contracts, in which Transelectrica as the system operator acts as a buyer of system services from the power generator.

At the beginning of the year Transelectrica determines annual quantities of electricity it may need in order to cover system losses, taking into account the portfolio contract quantities, which are also set at the beginning of the year. SO then enters into system services contracts with producers based on the ANRE Decision 127/2002, and as modified by ANRE Order 34/2002. The contracted amounts for each producer are proportional to the total monthly electricity amounts delivered by each of these producers into the transmission system. Transelectrica is declared the only system service supplier.

The Methodology for calculating the tariff for system services has been approved by ANRE Order 34/6.12.2004.

## **LEGISLATION**

### **Primary Legislation**

The following legal acts are among the key documents of electricity market primary legislation. Provided below is a summary of each act:

- Electricity Law 318/2003;
- Government Decision 540/2004 on approval of Licensing and Authorizations Regulation in the Power Sector of Romania.

### ***Electricity Law 318/2003***

Law 318/2003, also referred to as the Electricity Law, was published in the Official Gazette on 16 July 2003. The main objective of the Government of Romania in promoting the Electricity Law 318/2003 was to strengthen existing national power sector legislation and harmonize it with the European Union legislation, to establish a comprehensive and well harmonized legislative and regulatory framework for the generation, transmission, distribution and supply of electricity and thermal energy from cogeneration in Romania.

The Law sets the regulatory framework for carrying out activities in the field of electricity and of heat produced in co-generation under conditions of quality and security in order to optimize the primary energy sources in compliance with the environmental protection norms. The Electricity law defines basics terms and describes licensing and authorization procedures, tariff setting concept and process, operators' responsibilities, consumers' rights, etc.



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### ***Government Decision 540/2004***

The Government of Romania has recently issued a new legislation - Government Decision 540/2004 – giving the authority to the electricity regulator to issue licenses and authorizations for power market players and approving the revised Licensing and Authorizations Regulation of ANRE. The decision was taken on the basis of Article 14 of the Electricity Law and abrogates the previous Government Decision 567/1999.

### ***Law 213/1998 regarding Public property and its legal regime***

This Law states that the public domain goods are inalienable; they can only be granted for administration, given in concession or rent. The Law also includes a list of items in the public domain of the state and its territorial-administrative units.

### ***Law 219/1998 on Concessions regime, modified by Law 528/2004***

The purpose of the Law is to regulate and organize the granting of concession of activities, services and goods.

### **Secondary Legislation**

ANRE has issued a significant number of regulations since its inception in 1999, including the Commercial, Transmission, Distribution and Metering Codes and also various Orders and Decisions that have implications on the operation of the electricity market. The following is a summary of some of these documents:

#### ***Commercial Code of the Wholesale Electricity Market***

The Document, approved by ANRE Order 25/2004, is the key document to the entire regulatory framework of the Romanian electricity sector.

The Commercial Code establishes the principles, rules and mechanisms regarding the formation/establishment of prices and commercial relations among market participants on the wholesale electricity market. According to this document (Section 3.2. on the wholesale electricity market, License Holders are free to engage in bilateral transactions with electric energy, including in export or import electrical energy bilateral transactions, according to Romanian legislation, including present Commercial Code and License conditions. Bilateral transactions on the wholesale electricity market are implemented by electricity sale-purchase contracts on determined periods.

The Code classifies the transactions on the wholesale market according to their duration in time as follows:

- Bilateral transactions for different time periods, on contractual grounds;
- Centralized (intermediated) transactions on short term, on the next day market (day-ahead market) and on the balancing market.

On the Wholesale Electricity Market, License Holders are free to engage in bilateral transactions with electric energy, including export or import of electrical energy bilateral transactions, according to Romanian legislation, with present Commercial Code and with License conditions. Bilateral transactions on the wholesale electricity market are certified by electricity sale-purchase contracts on determined periods. Provisions of the Commercial Code are mandatory for the wholesale market transactions.

The Code also establishes commercial rules for acquisition by the System & Transmission Operator of secondary and tertiary control reserves, of reactive power for voltage regulation and other technological



services needed for National Power System safety. The Commercial Code also establishes the commercial rules for allocation of available interconnection capacities established by the System & Transmission Operator as per Transmission Grid Technical Code. Other details covered by this document are available in English and Romanian on website of ANRE ([www.anre.ro](http://www.anre.ro)).

### ***Transmission Grid Technical Code***

The Transmission Grid Technical Code was approved on the basis of the ANRE Order no. 20/2004. The Code sets forth rules and requirements for the technical operation of the power grid, as well as guidelines for connection, third party access and acquisition of system services by the transmission operator. Its role is to establish the minimal technical rules and requirements for the electric energy market participants that are necessary to secure a safe and economic operation of the National Power System (SEN). Its objectives are:

- To establish a set of rules and norms to ensure users' access to the Electricity Transmission Grid (ETG);
- To establish a set of rules and norms for the dispatch management of the SEN;
- To establish responsibilities and obligations for Transelectrica and for other ETG users;
- To indicate the quality technical parameters for ETG operation;
- To establish the dispatch management procedures for the generation units, in accordance with the electric energy market regulations;
- To establish the technical requirements for connection to ETG;
- To establish the technical requirements for the dispatchable units connected to the electricity distribution grid;
- To establish the principles for ETG development;
- To establish the interfaces and the information flows between Transelectrica and ETG users.

### **Frequency in the SEN:**

Nominal SEN frequency is 50 Hz.

Regulated frequency variation limits are:

- (a) 47.00 – 52.00 Hz for 100% of year duration;
- (b) 49.50 – 50.50 Hz for 99.5 % of year duration;
- (c) 49.75 – 50.25 Hz for 95% of a week duration;
- (d) 49.90 – 50.10 Hz during 90% of a week duration.

### **Voltage in the ETG and 110 KV network:**

Nominal values of the voltage are 750 kV, 400 kV, 220 kV and 110 kV.

Normal voltage values are considered the ones within the admissible ranges of variation as follows:

- in any point of 750 kV network: 735 – 765 kV
- in any point of 400 kV network: 380 – 420 kV
- in any point of the 220 kV network: 192 – 242 kV
- in any point of 110 kV network: 99 – 121 kV

Quality of voltage/intensity curves corresponds to technical regulations in force as follows:



- Voltage curve shape – Total Factor of Harmonics Distortion – 3% at High Voltage
- Ratio between negative sequence and positive sequence: Non-symmetry factor of negative sequence: 1% for High Voltage.

### ***Technical Code of Distribution Grid (Distribution Code)***

The Distribution Code was approved by ANRE's Decision no. 101/2000. It establishes mandatory rules and procedures for all participants on the Electric Energy Market, for scheduling, development, exploitation, administration and maintenance of the Electric Distribution Grid. Its scope is to promote and impose minimal technical rules and requirements for a safe, stable and economical operation of the electrical distribution grid, for the benefit of all its clients.

The objectives of the Code are:

- To establish a set of rules and norms to ensure users' access to the electricity distribution grids;
- To establish responsibilities and obligations for the Distribution Operators and for all the electricity distribution grids' users;
- To establish the performance standard for the electric energy distribution service;
- To establish the technical requirements for users' connection to the electricity distribution grids;
- To establish the requirements for the electricity distribution grids' development;
- To establish the interfaces and the information flows between the Distribution Operators and the Transmission Operator, the System Operator and the electricity distribution grids' users.

### **Metering Code**

The Metering Code, approved by ANRE's Ordinance 17/2002, provides ways to determine quantities of electricity traded among wholesale electricity market participants; it establishes the obligation and the principles of measuring the electric energy exchanged between the installations of physical or legal persons developing generation, transportation, distribution, supply or usage activities. Currently, metering is not possible on an hourly basis and is therefore determined on a monthly ex-post basis.

The Code establishes rules concerning:

- Establishment of the metering points;
- Electric energy metering;
- Defining the functions of the Metering Operators;
- Purchasing the values of the ranges particular for the technical system services;
- Ensuring transparency as regards the electric energy metering activity;
- Compliance with the European Union's practices in this field.

### **Regulations for the Electric Energy Supply to Consumers**

The Regulations for the Electric Energy Supply to Consumers were approved by GD 1007/2004. They establish the relationships between the electric energy supplier and consumer, consumer and sub-consumer, as well as the adjacent relationships of supplier with the distribution operator, with the transportation and system operator, concerning the development of the electric energy supply contract.

They include a chapter regarding the Quality of the electric energy supply service, developed into 12 sections, as follows:

- Responsibilities



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- Commercial quality
  - Electric energy quality
  - Continuity of supply
  - Types of quality indicators
  - Quality monitoring
  - Punishments for quality non-compliance
  - Penalties for non-compliance with the quality indicators
  - Tariff discounts for voltage level deviations
  - Liabilities for damages proved to be the network operator's fault
  - Liabilities for damages proved to be the consumer's fault
  - Notification and analysis of the complaint regarding the material damage

### **ANRE's Orders and Decisions**

ANRE's Orders and Decisions have implications on the operation of the electricity market. All regulations issued by ANRE can be found at [www.anre.ro](http://www.anre.ro).

## **4.2. Legal and Regulatory Framework Review - Railway Sector**

### **PRIMARY AND SECONDARY LEGISLATION**

A number of legal acts collectively constitutes the legal and regulatory framework that specifically governs railway transportation activities in Romania. The key pieces of legislation are as follows:

- Governmental Emergency Ordinance 12/1998 regarding the Romanian railway transportation and restructuring of the Romanian National Railway Company (SNCFR, *Societatea Nationala Caili Ferate Romane*);
- Government Decision 581/1998 regarding the establishment of the Romanian National Railway Company (CFR);
- Government Decision 582/1998 regarding the establishment of the Romanian National Company for Freight Transportation (SNCFR *Marfa*);
- Government Decision 584/1998 regarding the establishment of the Romanian National Company for Passengers Transportation (SNCFR *Calatori*);
- Government Decision 626/1998 regarding the organization and operation of the Romanian Railway Authority (AFER, *Autoritatea Feroviara Romana*);
- Government Ordinance 41/1997 approving the Romanian Railway Transportation Regulations.

All of the above regulations are supported by a significant number of secondary legislation, mainly consisting of orders issued by the transport minister.

Most of this secondary legislation was enacted to implement EU Directives in this sector, thus harmonising to a large extent the Romanian and European legislations.



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## REGULATORY BODIES

### Ministry of Transports, Constructions and Tourism

The Ministry of Transports, Constructions and Tourism is a specialized body of the central public administration, with legal personality, subordinated to the Government of Romania. It represents the State authority in the field of transports, constructions and tourism, exercised directly or by specialized technical bodies, subordinated public institutions, units operation under its authority or coordination or authorized trade companies.

### Railway Regulator AFER

The Romanian Railway Authority – AFER (*Autoritatea Feroviara Romana*) is **the specialized technical body** of the Ministry of Transports, Constructions and Tourism, set up by Government Decision 626/1998. AFER is a public office with legal structure, entirely financed by extra-budgetary funds, in charge of delivery of specific services and development of other own and related activities, rent, editorials, studies, projects, works, other services, exploitation of administered goods, on tariffs set according to the regulations (Transport Minister Order 137/2003 approving tariffs for specific services carried out by AFER).

AFER was set up in accordance with the EU Directives statements regarding the interoperability of the railway transportation and the railway operators' licensing, by merging the ex-Romanian Railway Register with the Railway Inspectorate. At present, AFER is structured into two main departments:

- Railway State Inspectorate (organized in every railway region) and
- Railway Register (organized at the head-office).

The **Railway State Inspectorate** has as main responsibilities and authorizations:

- Checking whether railway transportation operators observe traffic safety, transport security, environmental protection and public services quality rules and regulations;
- Surveying whether compulsory technical norms for construction, upgrade, operation, maintenance, repair and technical verification of railway infrastructure are observed;
- Working out technical norms and regulations in this sector.

The **Railway Register** carries out the following activities:

- Preparing railway technical norms aiming at compliance with the European and international ones;
- Evaluating railway transportation operators and granting licenses and safety certificates;
- Examining and granting certificates, licenses to staff working in the field of railway transport;
- Performing technical homologation of the railway transport vehicles and of the rolling stock;
- Authorizing, from the technical point of view, the rails, the signaling, traffic control and electric supply equipment, as well as the industrial railways;
- Authorizing, from the technical point of view, the operation of the railway stations;
- Certifying / homologating materials, components, equipment and technologies used in building, repair, maintenance and operation of railway rolling stock and infrastructure and to grant technical agreements for these.



## The Administrator and the Operators of the Romanian Railway Infrastructure

By Government Emergency Ordinance 12/1998 regarding the Romanian railway transportation and restructuring of the Romanian National Railway Company (SNCFR), the latter was restructured, by spin-off, into:

- The Romanian National Railway Company – CFR;
- The Romanian National Company for Freight Transportation – CFR Freight (*CFR-Marfa*);
- The Romanian National Company for Passengers Transportation – CFR Passengers (*CFR-Calatori*);
- Administration of Railway Assets Society – SAAF (administrator for remainder of assets after SNCFR divestiture);
- Railway Management Services Society – SMF (provider of finance and accounting services, foreign loan administration and legal services).

## The Romanian National Railway Company – CFR

- CFR is a Romanian legal person, organized as a joint stock company. It is the **public railway infrastructure administrator** (based upon the concession agreement with the Romanian State, represented by the Ministry of Transports, Construction and Tourism).
- CFR administers the fourth largest railroad network in Europe, with over 14,000 km of track, divided into 8 sectors (“*Regionale*”). In Romania, railway transport holds 36% of commodities transport and 50.6% of the passenger transport.

According to existing legislation and regulations in the sector, a new entrant on the Romanian railway market can follow one of the two possible regulated entry routes:

- Private infrastructure **administrator** – administering railway infrastructure; and
- Authorized railway transport **operator** – carrying on railway transport activities.

ADMINISTRATOR	OPERATOR
As a potential administrator, the company must sign a sub-concession agreement with CFR, the public railway infrastructure administrator, including a rent and tariff negotiation for services provided by CFR on that private infrastructure.	As a potential operator, the legal entity must be authorized as railway transportation operator (by AFER), and after receiving the transportation license and safety certificate (from AFER), must sign an access agreement with CFR, and negotiate tariffs, routes and services pack.

There is also the possibility that a company fulfilling all requirements can become both an infrastructure administrator and a transport operator.

The first **operators** under evaluation in order to obtain the right to operate on the Romanian railway network were the two transportation companies spun-off from the ex-SNCFR: CFR-Freight and CFR-Passengers. In 2000, after AFER’s evaluation, they obtained both railway transportation operator licenses and safety certificates. During the same year, other three private operators (SC SEFER SA Brazi, SC UNIFERTRANS SA Bucuresti and SC TAF SRL Galati) obtained railway transport operator licenses and safety certificates, thus introducing competition in the railway freight transportation sector.

## The Romanian National Company for Freight Transportation – CFR Freight

CFR – Freight, the **railway transport operator**, is a Romanian legal person, organized as a joint stock company.



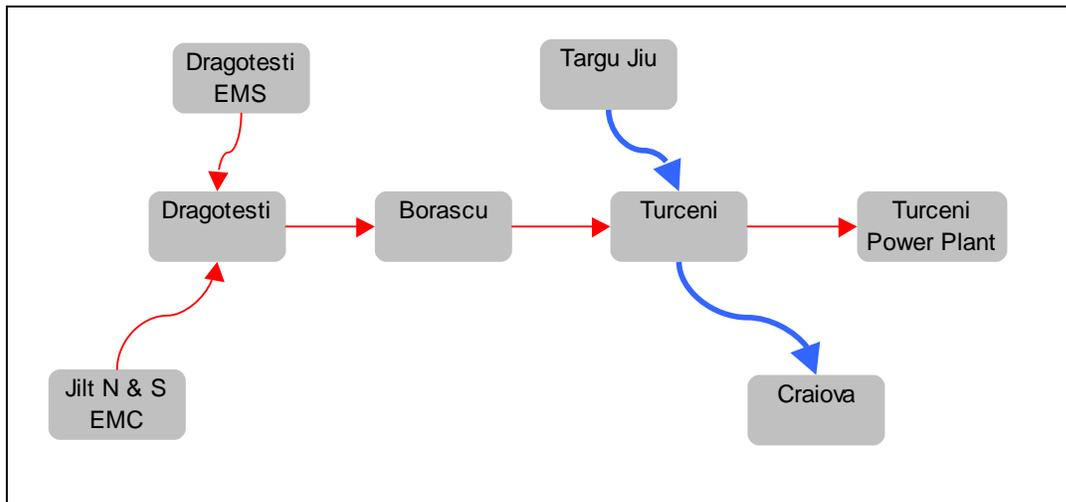
## TRANSPORTATION SYSTEM REQUIREMENTS

Turceni Thermal Power Plant uses, as main fuel, lignite supplied from various coalmines within 25 to 120 kilometer distance from the power plant. The power plant is supplied by rail and there are dedicated railroad lines that connect the coalmines to Turceni TPP.

The Government of Romania decided (GD 103/2004) that the major coal mines that supply the Turceni TPP (Jilt Nord, Jilt Sud and Dragotesti), along with the dedicated railroad lines, be bundled together into the Turceni Energy Complex and be subject to private capital injection.

The dedicated railroad lines are 29 km long and were built in 1967. The plant operates an unloading system and a storage system with a capacity of about 1 million coal tons of coal.

### The railway transportation map:



The railway transportation process is divided into the following three components:

### 1. Dragotesti – Borascu – Turceni tracks

At present, the railway track Dragotesti – Borascu – Turceni is in the public domain, on concession to CFR from the Romanian State. The transport operator is CFR-Freight, and Turceni Complex has a transportation agreement with CFR Freight. Turceni Complex pays the usual transportation tariff and receives a 10% discount for timely payment. There are 3 stations and 29 km of track.

CFR has an authorization from AFER for these railway tracks.

### 2. Dragotesti - Borascu- Turceni (other facilities)

All railway stations are in the public domain and are used on concession basis by CFR from the Romanian State (represented by the Ministry of Transports, Constructions and Tourism as Concessionary Authority).

Dragotesti is the collection point for coal transported from both Dragotesti EMS<sup>1</sup> and Jilt EMC<sup>2</sup>.

Borascu public railway station is also a halting place, but it is much deteriorated and requires upgrade. It is very important in the transportation process as between Turceni and Dragotesti there is only a single railway track. In Borascu, there are two lines of track, so two trains can pass by each other, thus

<sup>1</sup> EMS – underground coal mine

<sup>2</sup> EMC – open-pit coal mine



decreasing waiting time and costs. The Turceni public railway station is passed across by the national route, Targu Jiu – Craiova.

CFR holds an authorization from AFER for these three stations and the tracks inside them.

### **3. Turceni TPP and Jilt EMC**

Dragotesti EMS and Jilt EMC are coal-loading points. They are considered to be loading stations, crossed by the plant's railway lines. They are private sector property, owned by the Turceni Energy Complex, but managed in accordance with CFR regulations. Turceni Energy Complex also owns locomotives, used only inside the plant, to carry the CFR-Freight cars from and to Dragotesti. For this purpose, trained personnel, authorized by AFER are used. A specialized company, authorized by AFER, carries out locomotive inspections and repair.

Turceni TPP is the unloading station, crossed by plant railway lines. It is private property, owned by Turceni Energy Complex, but managed in accordance with CFR regulations. Turceni Energy Complex also owns locomotives, but they are used only inside the plant lines, to carry the CFR-Freight cars to and from Turceni public railway station. For this purpose, trained personnel, authorized by AFER are used. A specialized company, authorized by AFER, carries out locomotive revision and repair. Turceni Energy Complex also owns the equipment for signaling, emission-reception of signals, and telecommunication. An AFER decision regarding the issuance of the maneuver authorization and the operation certificate to Turceni Energy Complex is expected. All of the above-mentioned are subject to certification and then examination by AFER, once they are part of the newly created complex.

The railway transportation process requires a specific technical infrastructure, locomotives and rolling stock, and facilities, including the following components:

#### **Railway Tracks**

Currently there are 29 km of railway tracks between Dragotesti and Turceni and another 11 km in or around the stations. These additional 11 km are needed for parking, maneuvering and other such activities and are required by law.

#### ***Railway engines (5 locomotives EA type and 1 LDE type)***

These railway engines are intended for the daily return transport of some 50 trains.

#### ***Rolling stock (520 cars)***

This rolling stock is to accommodate round trips of some 50 trains with coal per day.

#### ***Stations (including garage, service buildings and devices)***

There are seven stations:

- Dragotesti EMS
- Jilt EMC Nord
- Jilt EMC Sud
- Dragotesti
- Borascu
- Turceni
- Turceni TPP



All of the above mentioned stations are currently AFER-authorized, whether they are a private property (Jilt EMC and Turceni TPP) or a public one, belonging to CFR (Dragotesti, Borascu, Turceni). All these authorizations must be renewed. Furthermore, Borascu station requires repairs and upgrade.

### ***Services providing remote controlling and signaling, traffic control and electric supply and the specific equipment and installation***

There is a package of services provided by CFR by the access agreement, but it is not known whether this package is compulsory, whether only a part of it is satisfactory or perhaps some additional services are demanded. Turceni Energy Complex through Turceni Thermal Power Plant owns equipment for signaling, emission-reception, and telecommunication but it is not known whether at this stage this is sufficient or, considering the new status envisaged, some extra services might be required.

### ***Trained personnel***

Staff working in the field of railway transportation must be tested and licensed by AFER. Both AFER and CFR are responsible for regular checks to ensure that this is the case. Additional staff will be required.

### ***Construction, repair and maintenance services, materials, equipment and technologies***

Specialized companies, authorized by AFER, provide all major construction, repair and maintenance services for locomotives and rolling stock. Still, there are certain repair and maintenance services that can be done in-house. Thus, the engine shed, the car inspection and mobile equipment for electric wire maintenance are internally provided. All these activities are subject to certification and examination by AFER, once they are part of the newly created complex.

In order to be a railway transportation **operator**, it appears that the following measures are to be taken:

- Listing of public or private goods transportation as a main activity object in the charter of the economic agent;
- Ensuring that conditions set forth in Government Emergency Ordinance 12/1998 are met. More specifically, the economic agent must possess or rent an adequate material base, as discussed in Article 2 of to the Ordinance. The economic agent must adhere to this regulation prior to requesting an AFER authorization;
- Obtaining a railway transportation license and safety certificate, issued by AFER in accordance with provisions of Transport Minister Order 778/1998 approving Norms for railway transportaion licensing and safety certification; and
- Signing an infrastructure access contract with CFR, including tariff, routes and service pack negotiated terms. The *infrastructure access contract* must include at least the following clauses:
  - Services provided to the railway operator, divided into:
    - Main Services:
      - railway access right,
      - railway and switches usage,
      - catenaries and substations usage,
      - supply of traction electricity,
      - train traffic and exploitation conditions;



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Supplementary services:

- access to station facilities, public terminals, warehouses, storage areas;
- Compulsory services: assistance in case of railway events;
- Optional services:
  - access to telecommunication network,
  - other related services.
- Parties' responsibilities regarding the traffic safety norms;
- Performance parameters regarding the quality of the provided services and train punctuality, mentioning also the parties' responsibilities;
- Maximum infrastructure usage tariff and tariffs for the services provided by the contract and of the rents;
- Responsibilities for the civil damages;
- Contract duration and revocation clauses.

The infrastructure usage tariff is expressed in ROL/train km. There are several factors to be taken into account when calculating the infrastructure usage tariff:

- Track technical parameters, i.e.:
  - Maximum traffic speed;
  - Number of restrictions;
- Traffic volume:
  - More routes will attract discounts;
- Route timing:
  - Peak routes are charged at higher tariff;
  - A route consists of train itinerary and schedule;
- Traffic type, i.e.:
  - Commodities, or
  - Passengers.

CFR negotiates the infrastructure usage tariff, granting discounts, based on the number of routes purchased, the traffic section, the request timing and the requested period. For local commodities transportation, negotiations are carried out among three parties: CFR, CFR-Freight and transport beneficiaries.

The transport customer must pay the infrastructure usage tariff directly into the CFR account in the local or foreign currency. The infrastructure usage tariff is paid in accordance with terms and conditions agreed by parties in the infrastructure access contract. CFR can temporarily suspend railway operator access to infrastructure for any payment delay over three working days. Furthermore, upon notification from CFR, the Ministry of Transport, Construction and Tourism may suspend or revoke the railway operator license.

In accordance with the infrastructure access contract, operators must notify CFR of the following:

- Train structure, i.e.:



- 
- Locomotive type,
  - Train length,
  - Number of cars and car characteristics,
  - Train weight,
  - Braking percentage, etc.;
  - Characteristic features of cars, i.e.:
    - RIV/RIC suitable,
    - Dangerous commodities according to RID, etc.;
  - Speed restrictions concerning the rolling stock;
  - Other data requested for ensuring traffic safety.

CFR has the right to verify, any time or place, whether train traffic is carried out in accordance with the regulations regarding the railway infrastructure usage.

CFR has the right to verify whether the railway operator obeys safety norms and technical regulations regarding the railway infrastructure access, i.e.:

- If the rolling stock park complies with the technical norms;
- If the personnel is trained, verified and authorized;
- If tracks and installation fulfill the minimum technical conditions as specified in the instructions, etc.

Periodical professional examination and authorization of railway operator personnel directly involved in the transportation process takes place under the supervision of AFER committees, involving a CFR representative.

### **4.3. Legal and Regulatory Framework – Mining Sector**

As in the case of railway infrastructure, mineral resources are also in the public property of the Romanian State.

#### **PRIMARY AND SECONDARY LEGISLATION**

##### **Mining Law 85/2003**

Mining Law 85/2003 provides the legal framework governing all mining activities in Romania, aiming to provide transparency for mining activities and competition, without discrimination between property forms, origin of capital and nationality of the operators.

Mining mineral resources in Romania may be done either by a company, whether Romanian or foreign legal entity, or by a public institution, having been granted a concession or management rights by the competent authority, ANRM – National Agency for Mineral Resources (described further in the Regulatory Bodies section below) according to the provisions of the Mining Law.

The mining activity as defined by law includes:

- *Prospecting*: An exclusive 3-year permit, does not guarantee the issuance of an exploration or operation license.



- *Exploration:* An exclusive 5-year license granted to Romanian or foreign legal entities, winners of public tender, with a prior work program and proper bank guarantee for environmental rehabilitation costs. The license may be renewed for an additional 3 years only.
- *Exploitation:* An exclusive license granted for a certain perimeter, as set by an ANRM order. The operation license may cover an initial 20-year period and may be extended later for 5 year periods. This license requires Government approval.
- *Sale of mining product*
- *Preservation and closure of mines*, including works or environmental recovery and rehabilitation.

As per Law 85/2003, the operating rights obtained by the exploitation and/or exploration license function as guarantee for bank loans, in order to execute mining activities stipulated in the license, with written approval of ANRM. Foreign legal entities that obtained the right to perform mining activities in Romania must establish and maintain a branch in Romania for the whole concession period. License holders must pay taxes for the performed activity, as well as a mining royalty to the State budget.

*Mining royalty* is set as a percentage quota of the annual mining production, according to the type of the exploited mining resource. The royalty is paid on a quarterly basis and for the coal exploitation it has a value of 2%. According to the Mining Law, there are several incentives offered to licensed mining operators, such as:

- Custom duties exemption for imports of goods necessary for performing mining activities in order to obtain the mining product;
- Custom duties exemption for imported new equipment, installations and devices that are not produced in Romania, necessary for the rehabilitation of the environment damaged by the mining activities.

The mining concession ceases when one of the following occurs:

- Expiration of the concession period;
- Waiver by license holder;
- License/permit cancellation by competent authority;
- Request of license holder, as a result of force majeure events;
- Exhaustion of mining resources (only in cases of concession/management granted for mining operation activities).

At the end of the concession, the perimeter and all existing facilities are transferred into State property with no indemnity and free of any encumbrances. The initiative to end the mining activity, either due to exhaustion of mining resources, or uneconomic results, lies with the operation license holder, who submits to the competent authority an application and an activity cessation plan. Mining Law 85/2003 sets out the obligation to provide a financial guarantee to the ANRM covering costs for remediation of closed sites. A recent Ministry of Economy and Commerce order introduced the FIDIC rules for contracting works in the field of mining sites remediation and mining closure activities.

A list of other relevant pieces of legislation comprise, among others:

- Law 82/1992 regarding State reserves;
- Government Decision 738/2003 regarding organization and operation of the Ministry of Economy and Commerce;
- Government Emergency Ordinance 64/2003 regarding the settlement of measures concerning setting-up, organization, reorganization or operation of some structures within the Government,



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ministries, and other specialized entities of the central public administration and of some public institutions;

- Government Decision 756/2003 regarding organization and operation of ANRM;
- Government Decision 258/1998 regarding organization and operation of ANRS;
- Government Emergency Ordinance 13/1999 regarding the granting of relaxations in payment obligations of budgetary arrears for certain mining legal entities;
- Criteria of 5 November 2002 regarding the provisions of the documentation for the framework exploitation methods in mines and quarries;
- National Agency for Mineral Resources' Order no. 74 of March 29, 2004 regarding the manner of reporting and calculation of the production value and of the mining royalty.

## MAIN AUTHORITIES

### Ministry of Economy and Commerce

The Ministry of Economy and Commerce is a specialized body of the central public administration, with legal personality, subordinated to the Government. It represents the State authority in the field of economic growth, industry, energy, mineral resources, commerce, European integration and international relations. Also, in accordance with the Mining Law, the Ministry ensures the carrying out of the mining activities,

### ANRM - National Agency for Mineral Resources

The National Agency for Mineral Resources (ANRM, *Agentia Nationala de Resurse Minerale*) is organized and functions as a specialized body of the central public administration, with legal personality, subordinated to the Government and coordinated by the Prime-Minister. It is the regulatory authority, responsible for the application of the provisions of the Mining Law and the Petroleum Law 134/1995 with its further amendments, and undertakes activities described in GM 756/2003.

**ANRM's structure is comprised of county departments for territorial inspection of the implementation of mineral and petroleum activities in accordance with the provisions of the mining license and the petroleum agreements. ANRM is financed from the budget of the Ministry of Economy and Commerce.**

### ANRS - National Administration of State Reserves

The National Administration of State Reserves (ANRS, *Administratia Nationala a Rezervelor de Stat*) is organized and is functioning as a specialized body of the central public administration, subordinated to the Government and coordinated by the Prime Minister. The administration of the State reserves is ensured in accordance with Law 82/1992 regarding the State reserves with further amendments and Government Decision 258/1998 regarding the organization and operation of ANRS.

The purpose and the role of ANRS is to apply the government program in the field of State reserves strategy, as internal source of security by establishing inventories of products and goods of major necessity for efficient interventions for protecting the population, the economy and the national safety in exceptional situations. In order to ensure the volume and the structure of these inventories, ANRS is developing trade activities of purchase-sale on the internal market and import-export on the external market, according to general norms for the market economy in force.



The quantitative and qualitative inventory integrity is ensured both in ANRS specialized units and in other legal entities' units, according to a contract. The decrease, in any way, without legal approval, of the quantity of State reserve goods that were handed for storage to the legal entities constitutes a criminal act and is punishable by prison. The National Administration of State Reserves, as part of the national safety, elaborates and presents to the Major State Defense Council and to the Romanian Government the State reserves strategy and the major objectives programs for its implementation.

Three state-owned **coalmining companies** were operating under the Ministry's authority, prior to Government Decision 103/2004 issuance. All three companies changed their status from *regie autonome* to commercial (still fully state-owned) companies. The three companies were as follows:

- National Lignite Company of Oltenia (CNLO) based in Targu-Jiu,
- National Company of Hard Coal (CNH) based in Petrosani, and
- National Coal Company (SNCP) based in Ploiesti.

The Government's coal sector policy has been to rationalize, restructure and finally privatize the three coal mining companies. The previous Mining Law (adopted in 1998) created the necessary legal framework for private investors to obtain licenses to produce coal and lignite. The subsidies have been substantially reduced for the three companies, to CNLO they were ended at the beginning of 1997.

CNLO was the primary producer of lignite in Romania, with production being sold almost exclusively for power and heat generation. CNLO accounted for 92% of total output of lignite, with the remainder produced by SNCP. CNLO was reorganized by GD 103/2004, which stipulated, among other things, that:

- Some of CNLO exploitations, namely EMC Jilt, EMS Dragotesti, EMC Rovinari, EMC Ruget-Securile would be bundled into the newly created energy complexes Turceni, Rovinari and Craiova;
- The National Lignite Society of Oltenia – SA Targu-Jiu was set up by taking over the share capital pertaining to the EMC Motru, EMS Motru, the mining exploitation Mehedinti, EMC Rosia, EMC Berbesti, as left after transfer of EMC Ruget-Securile, as well as the Albeni mine, BATS Rovinari and BATS Motru;
- The name of CNLO was modified into the Commercial Company for Mines Closure-Preservation - S.A. Targu Jiu and has as main object of activity, in its form after spin-off, the obligation to collect arrears and payment of debts taken over from the mining exploitations and sub-units which were bundled into the energy complexes, as well as the closure of non-profitable mines in order to liquidate losses, with possible privatization of some of the assets which could be rendered viable under the law.

The National Coal Company (SNCP) based in Ploiesti is the second largest producer of lignite and brown coal, with mines in the Southeast, Central and Northwest Romania. The National Company of Hard Coal (CNH) based in Petrosani produces hard coal from three regions – the Jiu valley, the Banat region and the Tebea region.

#### **4.4. Legal and Regulatory Framework for Environmental Protection**

##### **HORIZONTAL LEGISLATION**

The basic act in the environmental protection field in Romania is the Environmental Protection Law 137/1995. This act provides the framework for all subsequent legislation, and, as a consequence of Romania's process for accession to EU, the act has been amended several times until now.



It states also the rights and responsibilities of all physical persons and companies related to environment, as well as the responsibilities of the central and local authorities in the field. From the regulatory point of view, the Environmental Protection Law requires that any company or legal entity that intends to propose a project that might have a certain environmental impact have to apply for an environmental permit before the construction works begin. A certain set of procedures is required to be performed and the environmental permit will only be issued after a detailed analysis takes place.

Thus, an Environmental Impact Assessment Study has to be carried out by a certified external organization and the public and any other interested stakeholders must be consulted, as specified in the GD 918/2002 and Ministry of Water and Environmental Protection (MWEP) Orders 863 and 864/2002.

Similarly, when a plant or project is going to be put into service or operation, the project owner will have to apply for an Environmental Operating Permit (EPP). The procedural steps are similar to the Environmental Permit, as required by the GD 573/2002.

In activities falling under the IPPC rules (Transposing in the Romanian legislation the provisions of the EC IPPC Directives) (Law 654/2002, approving the Government Emergency Ordinance 34/2002 on IPPC, and subsequent regulations, MWEP Order 818/2003), such as the large combustion plants – as is the case with Turceni Power Plant, the owner has to apply for an Integrated Environmental Operating Permit. Environmental Protection Law 137/1995 (as amended) and Law 137/2000 (on certain measures for privatization acceleration) require also an Environmental Privatization Permit (EPP) when major shares of a company are transferred to another shareholder or when certain assets of a company are rented out or sold.

In Romania, the National Environmental Protection Agency has local offices (Environmental Protection Inspectorates) at county level, which establish the requirements for issuing the EPPs for the company's facilities. Usually, the Environmental Protection Inspectorates (EPIs) issue the EPPs based on existing documentation or they require the existing owner to perform some studies/audits, through a licensed consultant. The EPPs are then issued, with attached Compliance Schedules (CS) comprising several sets of measures (with deadlines) to be implemented by the new owner, as well as a list of potential environmental liabilities.

The EPPs are valid for two years from the issue date. In a maximum period of 6 months after privatisation the new owner is obliged to undergo the procedure for obtaining a new Environmental Operating Permit (EOP), as outlined in the Environmental Protection Law and detailed in the Government Decision 573/2002. The latter will include the same actions as in the EPP, but, if the EPI deems necessary, it may also include new actions. The deadlines for completing these actions and the validity of the EOP may be negotiated with the EPI and staged over maximum 5 years.

When applying for the above-mentioned permits, the plant owners/operators will have to pay a tax, as stated in the respective legal references. All released pollutant flows are also subject to taxation, as required by the Law on the Environmental Fund (Law 73/2000, as amended).

### **Legislation on Air Pollution Control**

The air pollution control field is regulated mainly by the Law 655/2001 on atmosphere protection. The main duties of plant operators/owners consist in adoption of adequate exhaust gas purification technologies, provision of trained personnel, monitoring of air emissions on a regular basis and reporting the results to the local EPIs. The core requirements included in the Atmosphere Protection Law are then further detailed by the Ministry of Water and Environmental Protection (MWEP) Order 462/1993 and MWEP Order 502/2003 on Air Emission Control from Large Combustion Plants. The latter should be applied in conjunction with the IPPC regulations, which require application of Best Available Technologies for Large Combustion Plants. Continuous Emission Monitoring Systems are a basic requirement for very large plants such as Turceni.



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### **Legislation on Water Pollution Control**

The Water Law 107/1996 provides the framework for water pollution control and water management activities in Romania. It establishes a set of obligations, which must be observed by the plant/facility owners and operators. Thus, any facility discharging wastewater into the sewerage network or natural receptors is obliged not to exceed the pollutant concentration limits provided in the water authorization/permit (as per requirements in MWEP Orders 277/1997, 699/1999 and 1141/2002), which are established starting from NTPA 001 or NTPA 002/2002.

It is also forbidden to build new industrial facilities or dwelling complexes without also building sewerage systems and wastewater treatment plants; to dispose any waste in water courses or bodies; to discharge wastewater in groundwater, lakes, reservoirs or ponds; to discharge oil products or hazardous waste into sewerage systems; washing cars, animals or household items in rivers or lakes. Water users are obliged to use water rationally and to reuse and re-cycle it whenever possible, observing the consumption norms per product unit. In addition they must reduce pollutant concentrations in the wastewater discharged; to ensure the proper operation of wastewater treatment plants; to monitor groundwater quality by observation boreholes in areas influenced by wastes of any kind. They are also obliged to prepare and to apply accidental pollution prevention plans, as required by MWEP Order 278/1997.

Water management permitting is similar with the environmental protection permitting. Payments are made for water services and penalties are applied for exceeding the allowed water abstraction volumes, discharge concentrations or water temperatures, while bonuses are granted to those water users who show a constant care for rational water use and for water quality protection. Water prices and pollution charges are established under the Law 404/2003 on the establishment of the National Water Administration.

When a company uses a natural water body as source for its own potable water needs, then the quality of water delivered “at the tap” should comply with the requirements in the Law 458/2002.

### **Legislation on Soil and Groundwater Contamination**

Romanian legislation has only soil quality requirements, stipulated in MWEP Order 756/1997 on environmental pollution assessment. This Order provides Alert and Action thresholds for concentrations of chemical elements in soil, depending on the land use pattern – sensitive uses and less sensitive uses.

The Alert threshold serves to notify the competent authority that contamination is present in soil. When the concentration of one or more contaminants exceeds the Alert threshold, the competent authority may seek to minimize further contamination, increase the frequency of monitoring of the potential contamination sources and request implementation of pollution prevention measures.

If the soil concentrations exceed the Action threshold for one or more pollutants, the competent authority requires a risk assessment study, an investigation upon the potential environmental effects of contamination and pollution prevention measures. In some cases, development of sensitive land use areas may be restricted. Should remediation actions be required, the competent authority will define the remediation targets. Order no. 756 specifies that the significance of contamination of soils by chemicals and other contaminants, which are not included in the Annex, will be estimated by the competent authorities based on studies completed by specialized units.

Romanian legislation does not currently provide maximum admissible concentrations in groundwater aquifers, which are not used for drinking purposes. For the aquifers used as drinking water sources, the reference values are those provided by the Drinking Water Law 458/2002. Legislation on groundwater and surface water pollution is under further review. Thus, Governmental Decision 118/2002 approved



the "Action Program for reducing aquatic and groundwater pollution generated by discharges of hazardous substances".

Within this Program, MWEF is developing a register of contaminated watercourses and water bodies. This inventory will be updated every 5 years and will be the basis of the pollution prevention and reduction action program. As the Turceni Energy Complex comprises mining development, it should also be noted that the new Mining Law 85/2003 sets the obligation to provide a financial guarantee to the National Agency for Mineral Resources, which must cover the costs for land reclamation after the closure of the site. A recent order of the Ministry of Economy and Commerce introduced the FIDIC rules for contracting works in the field of mining sites remediation and mining closure activities.

#### **WASTE MANAGEMENT LEGISLATION**

Waste management activities at the level of the industries are regulated by the Law 426/2001 on waste disposal, which sets the obligations of the waste generating companies, waste transporters, waste recycling and waste disposal facility operators separately. The main provisions refer to proper design of products and technologies focusing on waste minimization, adequate selection of packaging materials for their products for waste minimization, avoidance of large stocks formation of raw materials and products so that the risk of their transformation into wastes be minimized, recycling/reuse/recover all wastes, if economically and technically feasible, proper disposal in authorized landfills, waste segregation before their final disposal/recovery, nomination and training of specialized personnel, preparation of contingency plans, record-keeping of waste flows.

The subsequent legislation covers the following particular issues:

- Waste disposal (GD 128/2002 on Waste Disposal + MWEF Order 1147/2002 on the Technical Guidelines on Waste Disposal + MWEF Order 867/2002 on quality criteria for waste disposal);
- Waste incineration (GD 162/2002 on Waste Incineration + MWEF Order 1215/2002 on the Technical Guidelines on Waste Incineration);
- Waste oils (GD 662/2001 + 441/2002 + 1159/2003)
- Waste batteries (GD 1057/2001).

Waste management information must be recorded and reported on a regular basis to the local EPI, as required by GD 856/2002 on Waste Management Reporting and European Waste Catalogue.

#### **LEGISLATION ON CHEMICALS AND RISK MANAGEMENT**

A new legislation was adopted in this field during the last 2-3 years, as a result of the transposition of the EU legal framework. In 2003, a new law on the regime of hazardous and toxic chemicals has been introduced (Law 360/2003). This law establishes the framework legal regime for the effective control and monitoring of the movement and use of hazardous chemicals. The law introduces the following approaches and requirements:

- a) assessment and control of health and environmental risks associated with the use of hazardous chemicals;
- b) market restrictions and use of certain hazardous chemicals;
- c) import/export control, including for the ozone-depleting substances;
- d) marketing and use of biocides;
- e) adoption and implementation of good laboratory practices.

Failing to implement the requirements could lead to fines up to 20,000 €



Subsequent legislation has also been introduced, with respect to labelling, market and use of such chemicals (Law 451/2001 on labelling the hazardous chemicals and subsequent GDs, GD 347/2003 on market restrictions and use of certain hazardous chemicals, Order 221/2003 approving the Code on the Certification of Hazardous Chemicals Packing used for their transportation) as well as for the assessment and management of associated risks (GD 98/2003 applying the EU SEVESO Directive, MWEP Order 1406/2003 on the Methodology for Rapid Assessment of Chemical Risks for the Environment and Human Health).

One of the main regulations in the field is the Law on Dam Safety (244/2000). It establishes a set of requirements for tailings ponds or pits, with potential impact on Turceni associated facilities. Main requirements look at dam stability and groundwater level and contamination monitoring, as well as at seepage control and tailings pond design, operation and closure. All operators of dams and tailings ponds are required to apply for a special permit under this set of regulations and regular checks must be performed by certified experts.

#### **HEALTH AND SAFETY LEGISLATION**

The main regulations in the field consist of the Work Protection Law 90/1996 and Ministry of Health Order 508/2002 – on General Occupational Health Protection Guidelines. The worker health and safety activity in industrial companies is subject to the Work Protection Law no. 90/1996 and to the General Occupational Health Protection Guidelines. Annex 2 of the Law provides the List with the activities that are the subject of the specific health and safety guidelines.

The Law provides obligations for the company management regarding health & safety measures: to assign health and safety prerogatives and responsibilities to employees; to adopt internal health and safety rules; to ensure staff training; to keep evidence of workplaces with health and safety risks; to ensure the permanent operation of protection, measurement and control equipment. Personal Protection Equipment (PPE) must be provided free of charge to employees. Protection food is provided free of charge to employees, as well as sanitary materials. The Company management has to obtain the Work Safety Operating Permit from the State Territorial Inspectorate and the Sanitary Operating Authorizations from the Public Health Direction.

The microclimate conditions and the permissible concentrations for noxious gases, noise and vibration at the workplace are stipulated by the General Occupational Health Protection Guidelines applying to Law 90/1996. Government Decision 261/2001 sets specific criteria for establishing when a workplace is under special conditions. The employers must take adequate measures for re-establishing the normal conditions for the working environment by the end of 2006, as required by the H&S Law and its guidelines and to pay for any necessary medical services for those employees exposed to any of the described occupational nuisances.

Government Emergency Ordinance 107/2003 requires the employers to contribute to insurance fund for occupational accidents and diseases and identifies the rights for financial and social assistance of the employees affected by occupational accidents and diseases until their recovery or retirement.



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## 5.0. COMMERCIAL OVERVIEW OF TURCENI ENERGY COMPLEX

### 5.1. Introduction

The Turceni Energy Complex (the “Complex”) is composed of the Turceni Thermal Power Plant (hereinafter “Turceni Thermal Power Plant,” “Turceni TTP” or “TTPP”) and the associated open-pit and underground coalmines Jilt and Dragotesti (hereinafter “the coalmines”).

The Turceni Complex was established on 25 March 2004 (date of the constitutive General Meeting of the Shareholders). At the end of 2004, the Complex held a 30-year authorization from the electricity regulator (ANRE Authorization No. 184) for the operation of 1,650MWe electricity and 68.64 MWt heat produced in cogeneration granted on April 17, 2003 (this authorization continues to be valid as it was issued for the power plant and hasn’t been influenced by the changes in the legal status of its operator).

The Complex made the necessary arrangements for transferring the 8-years electricity supply license and the 25-years electricity generation license issued by ANRE for Turceni TPP to the new entity. Thus, Turceni Energy Complex was granted the Power Generation License No. 602 and Power Supply License No. 603 on April 23, 2004 based on ANRE Decisions 112 and 113, respectively. In 2004, the Complex also received a 25-year system services supply license, no. 617/2004.

The combined annual production of the three mines is about 5 million tons of lignite with sales of the mining product mainly to the power plant, located at approximately 30 km southeast. As mineral resources are State property, the mining operator (CNLO, and later the Complex) is required to obtain and maintain a valid exploitation license from ANRM, the mineral resources regulator.

In accordance with the provisions of the Mining Law (Article 24), the licenses currently in place – Jilt Sud Exploitation License no. 2603/2001, Jilt Nord Exploitation License no. 2602/2001, and EMS Dragotesti Exploitation License – were transferred to the Complex based on a previous notification of ANRM. The licenses for Jilt carriers’ exploitations are valid until the end of 2019 (they were issued for a 20 year period) while the license for the underground mine in Dragotesti will expire in less than 2 years.

### 5.2. TURCENI TPP COMMERCIAL OVERVIEW

#### MAIN CUSTOMERS

##### Electricity Sales

The Complex currently sells its output on both the regulated and the competitive wholesale Romanian electricity markets and also started in November 2004 to export electricity.

The electricity market in Romania is undergoing a gradual liberalization process with 83% of all electricity consumers having been granted eligibility status and the right to switch electricity suppliers. Despite this high level of official market opening, only eligible customers accounting for about 25% of the entire consumption have actually switched their electricity supplier.

The power plant generated a total of 5.665 TWh in 2004. A bulk (79% of total) of TTPP’s sales were to the Electrica supply and distribution companies on the basis of portfolio contracts and contracts for differences. The remaining power output was sold to SC Electrocentrale Deva SA and Hidroelectrica on the basis of assurance contracts. Some electricity was also sold on the spot market and on the basis of system services contract to Transelectrica, the transmission system operator.

Table 5.1. presents sales to main customers during year 2004.

**Table 5.1: Sales in 2004**

Company Name	GWh	Million ROL	Percentage (%)	
			Quantity	Value
Electrica	5,072.68	6,393,513	91.58	92.64
Small suppliers	288.16	369,189	5.20	5.35
Hidroelectrica	36.14	51,234	0.65	0.74
Other producers	142.02	87,354	2.56	1.27
<b>Total sold in 2004</b>	<b>5,539</b>	<b>6,901,290.</b>	<b>100.00</b>	<b>100.00</b>

As the wholesale electricity market continues to liberalize, power traded on the regulated market will decline to reflect the level of market opening.

### *Portfolio Contracts*

Portfolio contracts were firm contracts for the physical off-take of pre-defined annual quantities by Electrica companies at pre-determined and regulated tariffs. Until 2005, these contracts were generally signed for a 12-month term, however in 2004, contracts were signed in mid-January and for a period of 11 months only. According to ANRE Order No. 33/2003, the quantity approved by the electricity regulator for the Turceni TPP portfolio contracts was equal to 4.53 TWh, but starting with July 2004, new quantities (lower, for Turceni) were established through the Order no. 14/2004, the changes being imposed for assuring the tariffs' stability after the setting-up of the lignite-based energy complexes (according to ANRE discretion).

In 2005, at the national level, the quantity to be supplied through portfolio contracts was reduced to 45% of the deliverable energy (as resulted from running the PowerSym program) from 82% in 2003 and 72% in 2004. In 2003, the portfolio contracts of Turceni power producer covered 72% of its deliverable output while in 2004 it was reduced to 68% and the intention for 2005 is that the major part of electricity sales is to be conducted on the bilateral contracts' market.

The table below lists the counter-parts of the Complex for the portfolio contracts, the regulator-approved quantities for portfolio contracts in 2004 and 2005, as well as contracted quantities by for the period February – December 2004.

**Table 5.2: Turceni Energy Complex: Portfolio contracts for 2004 and 2005**

Off-taker	Approved 2004 GWh Order 33/2003 / Order 14/2004	Contracted Feb –Dec 2004 GWh	Approved 2005 GWh
Electrica Muntenia Nord	842.7 / 762	768.1	423.9
Electrica Muntenia Sud	805.9 / 763	739.0	476.6
Electrica Oltenia	707.8 / 470	642.5	114.3
Electrica Transilvania Sud	572.8 / 585	521.7	832.4



Off-taker	Approved 2004 GWh Order 33/2003 / Order 14/2004	Contracted Feb –Dec 2004 GWh	Approved 2005 GWh
Electrica Transilvania Nord	536.1 / 614	485.7	715.4
Electrica Dobrogea	483.6 / 374	449.6	192.6
Electrica Banat	364.1 / 364	328.1	361.7
Electrica Moldova	214.7 / 224	195.0	208.7
TOTAL	4,527.7 / 4,156	4,129.7	3,325.6

Source TTPP Management, 24.03.2004, ANRE Orders No. 33/2003 and 14/23.06.2004 and ANRE Decision no. 503/20.12.2004

The portfolio contract price was determined in 2004 through ANRE regulations (ANRE Decision No. 493/2003, subsequently modified by ANRE Decision No. 72/2004 and ANRE Decision No. 106/2004). As established by these ANRE decisions, in 2004 the regulated tariff for sales of electricity to portfolio contract holders was ROL 1,218,000 or the equivalent of US\$ 37 / MWh (at the rate of US\$1 = ROL 33,000). ANRE Decision no. 503/20.12.2004, Annex 1, established the annual average regulated price for the portfolio contracts to be applied by the large producers (over 20MW installed) from 1 January 2005, price set to ROL 1,250,000 per MWh (US\$ 4.2/MWh 3, at the rate US\$1 = ROL 29,000) for Turceni Energy Complex.

Starting with January 1, 2005, the portfolio contracts are to be concluded only for a period up to three years. Different from the precedent year, the newly concluded portfolio contracts are for fixed annual quantities and prices and hourly settlement of the energy. It is allowed to modify the contracted quantities and prices according to the Methodology approved by the ANRE's President Order no. 26/2004 of ANRE's President only if a "change in circumstances" occurs, such as changes in the legal and regulatory framework, inability of one of the parties to adhere to contract's terms, implementation of an adverse court decisions etc.

Portfolio contracts also cover payment for the  $T_G$  (injection of electricity into the grid) component of the transmission charge. The Electrica supply and distribution companies pay this element of the transmission tariff to Turceni TPP for pass-through to the transmission system operator Transelectrica in accordance with the transmission services contract between Transelectrica and TTPP. Invoicing takes place at regulated tariffs valid at the time of issue of the invoice and on the basis of a transaction note issued by the market operator OPCOM.

According to its portfolio contracts, Turceni Energy Complex may decide to cover contracted amounts either by producing in the TTPP generating units listed in the contract (blocks 1, 3, 4, 6, 7) or may choose to purchase electricity from a third party in accordance with the regulations of the New Commercial Code approved by ANRE Order No. 25/2004. However, Turceni Energy Complex has yet to test the power price arbitrage opportunities by purchasing electricity cheaper on spot market or bilateral agreements if cheaper than producing on the premises.

Both Turceni Energy Complex and electricity off-takers are obliged to respect the Dispatch and Scheduling Regulations. Metering takes place in accordance with Metering Regulations (ANRE Code 17.1.127.0.01.20/06/2002). Actual traded quantities are determined as the quantity injected into the network by each generating unit less own consumption (as determined by an algorithm called "Program for Determining Transmission Losses") less export quantities less quantities supplied to eligible customers and other generators or electricity suppliers.



Turceni Energy Complex issues invoices for contracted quantities within five business days from start of the delivery month. The generator issues settlement invoices after receipt of a transaction note from OPCOM. In accordance with portfolio contract clauses, settlement should take place within 15 business days from the beginning of the month following the delivery month. In practice, however, OPCOM sends transaction notes with significant delays resulting that off-takers are having only one or two days only to pay VAT for amounts invoiced by the deadline of the 25<sup>th</sup> of the month.

Off-takers are responsible for invoice payment in the following manner:

- a) One-third in daily installments during ten calendar days from the date of invoice receipt;
- b) Two-thirds in daily installments starting on the 16<sup>th</sup> of delivery month and until the 22<sup>nd</sup> of the following month.

Off-takers make daily installment payments in accordance with the Procedure for the Distribution of Income from Electricity Sales to the Consumers, which is approved by ANRE and is often modified by the regulator. According to a special clause in the current portfolio contracts, in the event of the vendor's (i.e. Turceni Energy Complex) restructuring through splitting-up into more companies or transferring some of the power generation capacities to other companies, the responsibilities of the contract in terms of contracted quantities and prices may be reviewed with previous ANRE consent.

### *Bilateral Contracts*

Bilateral contracts may be concluded with energy suppliers or with other producers and with eligible consumers. In 2004 (until the ANRE Order 21/2004) was issued Turceni Complex negotiated two types of contracts for differences in an attempt to hedge its exposure to the price volatility risk inherent in spot market transactions:

- With supply and distribution companies;
- With other power generators.

**Contracts for differences with supply and distribution companies:** In 2004 Turceni TPP continued to supplement its portfolio contracts with a set of bilateral contracts signed with the electricity distribution and supply companies to cover supplies of any additional quantities over the portfolio contract quantities. In 2004 bilateral contracts for differences defined monthly contract quantities as contracts determined by the market operator (in accordance with the ANRE regulations) and equal to both parties' spot power market trades during the contract month. There was no differentiation between the 20% supplied at regulated tariffs and the remainder at negotiated tariffs.

The 2004 negotiated price was significantly higher as compared to 2003, ranging between 12.3% and 13.3% on top of the Turceni regulated tariff. In 2003 negotiated prices were merely 0.06% higher than Turceni's regulator-approved tariff.

**Table 5.3: Contracts for differences with supply and distribution companies in 2004  
(1 USD = 33.000 ROL)**

Offtaker	Contract No.	Neg. Tariff ROL/MWh	Neg. Tariff US\$/MWh	% Increase
Electrica Muntenia Nord	36/2004	1,378,776	\$41.8	13.2%
Electrica Muntenia Sud	35/2004	1,379,994	\$41.8	13.3%
Electrica Oltenia	37/2004	1,367,814	\$41.4	12.3%
Electrica Transilvania Sud	33/2004	1,376,340	\$41.7	13.0%



Offtaker	Contract No.	Neg. Tariff ROL/MWh	Neg. Tariff US\$/MWh	% Increase
Electrica Transilvania Nord	38/2004	1,378,776	\$41.8	13.2%
Electrica Dobrogea	40/2004	1,377,558	\$41.7	13.1%
Electrica Banat	34/2004	1,376,340	\$41.7	13.0%
Electrica Moldova	39/2004	1,367,814	\$41.4	12.3%
Average Tariff		1,375,427	\$41.7	12.9%

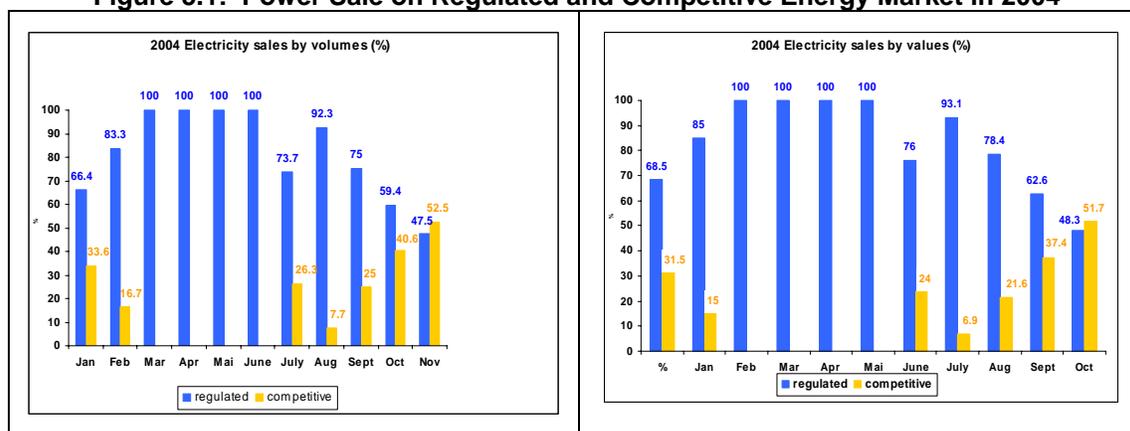
Source: Annex 1 to bilateral contracts with Electricas

**Negotiated contracts for differences with generators:** Turceni TPP has negotiated with several domestic power producers a second type of bilateral contracts, also referred at as assurance contracts (“contracte asiguratorii”). It has concluded such contracts with the thermal power producer SC Electrocentrale Deva SA (“Electrocentrale Deva”) and the hydropower producer Hidroelectrica. According to such assurance contracts, TPP supplies power to the above producers to cover their firm contractual obligations in times of drought (as was the case in 2003) or other unforeseen circumstances.

Turceni TPP signed the assurance Contract No. 807 – with Electrocentrale **Deva** on May 7, 2003 in order to minimize spot market price volatility risk for both electricity generation companies. According to Article 8, the contract expired on December 31, 2003, but it was extended by the Additional Act on 04.01.2004, amending the supplier’s name to SC Turceni Energy Complex SA and the expiry date 12.31.2004.

Due to the changes in the electricity market regulations introduced by ANRE starting with the second half of 2004, a share of Turceni sales through bilateral contracts has increased. The dynamics of power sales on the regulated and on the competitive markets of Turceni Complex during the first 11 months of 2004 is shown in the next figure.

**Figure 5.1: Power Sale on Regulated and Competitive Energy Market in 2004**



Supported by the current regulations and by the regional market demand, Turceni Energy Complex was successful in concluding an export contract together with Hidroelectrica for equal amounts of sold electricity to Hungarian consumers, through Romelectro (Contract no. 491 224-6477 / 27.10. 2004). According to the provisions of this contract, Turceni provides for 50 MW at peak hours, at a competitive price, but still over its generation cost. In November 2004 the export was 16.8 GWh and in December another quantity of 17.6GWh was sold. The contract will continue in 2005 for the same power of 50 MW



to be supplied to 16 Basic Settlement Intervals (BSI) in the Hungarian working days. The price will be renegotiated for the whole year 2005.

The main electricity contracts of TEC during 2004 are described in Table 5.4.

The new Commercial Code approved by ANRE Order no. 25/2004 enforced starting 1 January 2005 establishes the following markets as part of the wholesale electricity market:

- Bilateral contracts' market
- Day-ahead market
- Balancing market
- Technological system services market.

In 2005 Turceni Complex intends to sell 80% of its energy output through bilateral contracts, the rest being traded on the day-ahead and balancing markets.

The proposed production level of the Complex in 2005 is also based on the Ministry of Economy and Commerce Order no. 668/22.09.2004 which removes Restriction no. 4 (through this restriction, the

lignite power units' disconnection was not possible below a certain level, related to a minimum quantity of lignite to be burned) thus allowing the Complex to accept new clients on bilateral contractual basis.

In this context, the Turceni Complex considers that an optimum level of production in 2005 should be with 3 power units producing in "flat load" regime, which means ca 910 MW. A quantity of 30 MW should be preserved for secondary regulation thus 880MW remaining as a total output. The own consumption for 3 power generation units is 60 MW, which finally leads to a quantity of 820 MW to be sold on the energy market. 380MW of this quantity would be supplied on portfolio contracts (the ANRE-regulated 45% of 820 MW at the country level was used). The integrated coalmines should receive maximum 50 MW (28-32 MW in average) and the remaining 390 MW will be traded on the competitive market. Priority will be given to the in time-cash-payer customers.

As regards cash collection for sales of electricity, the TEC management states that the overall collection rate per 2004 was about 75%, of cash collection representing about 50.8% of that. The following table points to a high share of barter sales with main buyers of electricity purchased from TEC (in bln. ROL):

**Table 5.4: Centralized Barter Sale of Electricity**

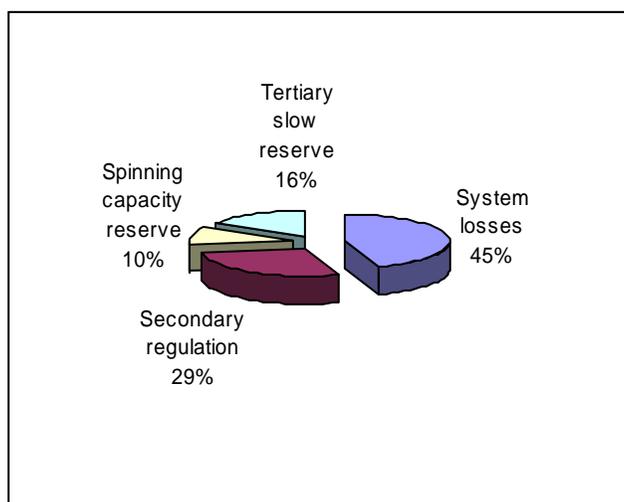
Beneficiary	Billed for Collection	Total	Paid		Current Balance
			DC		
			In Cash	Cleared in Compensation / Barter	
Electrica Bucharest	9.988.926	7.305.680	3.710.855	3.594.825	2.863.246
Hidroelectrica	1.061.625	585.967	67.000	519.967	467.658
Transelectrica	604.702	568.009		568.009	36.693
<b>Total</b>	<b>11.655.253</b>	<b>8.460.656</b>	<b>3.777.855</b>	<b>4.682.801</b>	<b>3.194.597</b>



## SYSTEM SERVICES

Turceni Thermal Power Plant is currently earning about ROL 15 bln (approx. USD 0.5 mln) a month from system services, of which revenues from tertiary slow reserve and secondary regulation contribute about 40% each and the remainder comes from spinning reserve services. See the Figure 5.1 below for more details.

**Figure 5.2: Turceni Energy Complex: System services revenues, by service type, Jan-Oct 2004**



Turceni Complex qualified several of its generation units to provide system services to Transelectrica, the transmission system operator. TPP obtained the final qualification status for the newly modernized Unit No. 4 and temporary qualification for Units no. 3 and 7. Turceni TPP has been qualified as a provider of frequency–power system control and secondary regulation services to Transelectrica and has been granted in 2004 by ANRE the license for provision of system services.

It should be noted that a number of Turceni generating units were granted “temporary-only” qualification status and further work should be done in order to upgrade them to a final qualification. A final qualification for Unit 7 is expected by March 2005.

System services are provided by Turceni Energy Complex to Transelectrica –based on Contract No. 6/2004 - in which Turceni acts as a seller of system services to Transelectrica and Transelectrica acts as a buyer of system services. This contract covers a five-year period from January 2004 until December 2008. On the basis of the above contract, Turceni TPP (presently Turceni Energy Complex) provides the following system services to Transelectrica:

- Electricity to cover transmission system losses
- Secondary regulation frequency – power control services
- Power capacity reserves – spinning and tertiary slow reserves.

For coverage of system losses, Transelectrica needs some 188,560 MWh at a price of 1,218,000 ROL/MWh (regulated price of TEC on the wholesale regulated market), or about 229,666,080,000 ROL for the entire year. The available capacities offered by the 330 MW units were: Unit 1 – 310 MW, Unit 3 – 310 MW, Unit 4 – 323 MW, Unit 6 – 290 MW, Unit 7 – 305 MW.

For secondary frequency/power control, TEC was offering units 3, 4 and 7, with minimum secondary control powers of 265, 270, 265 MW, with maximum secondary control powers of 310, 323 and 305 MW, with the loading/unloading speed within the secondary control band of 3 MW/min, with a minimum



secondary control band ensured at 4 MW and a maximum ensured secondary control band of 30 MW. The reference tariff was 331,100 ROL/hMW, with some 21-22,000 hMW contracted monthly (on annual level some 87,251,472,000 ROL).

For the spinning reserve, an unit price of 324,601 ROL/hMW was earned, while for the slow tertiary reserve a price was 82,775 ROL/hMW. The spinning reserve was provided by units 3 (310 MW), 4 (323 MW) and 7 (305 MW), for frequencies between the limits 48.5-51 Hz. The minimum functioning capacity was 265 MW (unit 3), 270 MW (unit 4), 265 MW (unit 7), thus ensuring a range for continuous magnitude of active power produced of 60 MW (unit 1), 55 MW (unit 4), 60 MW (unit 7), at a loading speed of 3MW/min. Some 744 hrs/months were secured contractually for this kind of service, providing some 3-4 bln ROL/month.

Turceni was also allowed to provide spinning reserve by units 1 and 6, with available capacity of 310 and 290 MW, respectively. Same frequency limits are requested as above (48.5 – 51 MW), minimum stable operation power of 265 MW, band of continuous frequency regulation of 60 MW (unit 1) and 55 MW (unit 7), at a speed of loading from start-up until reaching synchronized level of 3 MW/min.

The slow tertiary reserve was supplied by units 3, 4 and 7 which were qualified for such system services. The synchronising time from cold status to parallel was 300 minutes, 30 minutes for synchronising from hot status, with 7200 seconds necessary for loading from parallel to available power. Maximum and minimal loads for these units are the same as for spinning reserve.

Similarly units 1 and 6 are also able to provide slow tertiary reserve and were contacted under similar performance indicators as units 3, 4 and 7, except for the minimum-maximum capacity range, which were 265-310 MW for unit 1 and 261 – 290 MW for unit 6. For tertiary slow reserves instantaneous capacity of about 280 MW were offered at a reference price of 82,775 ROL/hMW, with total monthly revenues of about 3-4 bn ROL/MWh with around 82,775 ROL/hMW.

A summary of revenues from system services from TEC on year 2004 would lead to the following conclusions:

Revenues from secondary control:	119 bn RO (equivalent to some 9.5 gcc/kWh)
Revenues from spinning reserve:	48.3 bn ROL (equivalent to some 3.9 gcc/kWh)
Revenues from slow tertiary reserve:	70.4 bn ROL (equivalent to some 5.6 gcc/kWh)

Table 5.5 provides a summary of results for supplied system services by TEC in 2004.



**Table 5.5: System Services – Prices, Quantities and Monthly Amounts in 2004**

Mo	Network losses		Secondary control		Spinning reserve		Slow tertiary reserve		Total without network losses		Total
	Quantity MWh	Value ROL	Quantity MWh	Value ROL	Quantity MWh	Value ROL	Quantity MWh	Value ROL	Quantity MWh	Value ROL	Value ROL
Jan	16279.277	19828159386	28088	14896976384	11680	6073109440	73920	9801200640	113688	30771286464	50599445850
Feb	11828.094	14406618492	16447	9035866671	8670	4669740030	38360	5268669180	63477	18974275881	33380894373
Mar	9391.550	11438907900	14028	7838664036	3780	2070755820	47040	6571346880	64848	16480766736	27919674636
Apr	7591.480	9246422640	15877	7827916695	3710	1793254470	40320	4969802880	59907	14590974045	23837396685
May	11454.581	13951679658	20391	8893086048	3880	1658959960	40320	4396170240	64951	14948216248	28899895906
Jun	11096.675	13515750150	23807	10592067598	5160	2250693960	47040	5232212160	76007	18074973718	31590723868
Jul	15540.521	19425651250	24587	12353713563	8730	4300284510	47040	5908788480	80357	22562786553	41988437803
Aug	12161.321	15201651250	16335	7361547435	7170	3167813550	47040	5299761600	70545	15829122585	31030773835
Sept	15947.316	19934145000	26389	11971026793	12020	5345690660	47040	5334759360	85449	22651476813	42585621813
Oct	17441.234	21801542500	21119	10555276200	12050	5904379500	40320	5037984000	73489	21497639700	43299182200
Nov	14562.280	18202850000	20155	11885806600	11680	6752733600	47040	6935107200	78875	25573647400	43776497400
Dec	11691.420	14614275000	10487	5853539277	7790	4262804850	40320	5626373760	58597	15742717887	30356992887
<b>Total</b>	<b>154985.749</b>	<b>191567653226</b>	<b>237710</b>	<b>119065487300</b>	<b>96320</b>	<b>48250220350</b>	<b>555800</b>	<b>70382176380</b>	<b>889830</b>	<b>237697884030</b>	<b>429265537256</b>

In order to allow a comparison between actual and contracted amounts, the contractual provisions and estimates are presented below.

**Transmission System Losses:** Annex 1 to System Services Contract provides an estimate of the capacity Transelectrica may need to cover transmission system losses. This 2004 estimated quantity was 188.6 GWh and has been broken down into monthly contract quantities in MWh, as well as average hourly contracted load in MW as shown in the table below.

**Table 5.6: TTPP Contracted Transmission System Losses (in GWh in 2004)**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
17.6	15.9	13.1	12.0	14.0	16.0	17.4	18.0	21.5	16.0	12.2	14.9	188.6

*Source: Annex 1 of Contract No.6/2004 between Electrocentrale Turceni and Transelectrica*

The transmission system losses tariff was the same as the ANRE tariff for Turceni TPP. It is currently that of ROL 1,218,000/MWh or the equivalent of US\$37/MWh (at the exchange rate of ROL 33,000 = US\$1 at 31/03/04). TTPP's estimated annual revenue from transmission system losses was ROL 229,714,800,000 (or circa USD7M).



## Secondary Regulation Services

System Services Contract, Annex 2, provides details of the secondary regulation services contracted between TTPP, now Turceni Energy Complex, and the transmission system operator. The annex listed the three TTPP/Turceni Energy Complex generating units qualified to provide these services - blocks 3, 4, and 7. The annex also listed available capacity, maximum and minimum capacity for secondary regulation for each unit and other related information. The following is a summary from annex 2:

**Table 5.7: TTPP Secondary Regulation (Frequency – Power Control) Services, by Qualified Unit**

Block No.	Available Capacity (MW)	MIN capacity for secondary regulation (MW)	MAX capacity for secondary regulation (MW)
Block No. 3	310	265	310
Block No. 4	325	270	323
Block No. 7	305	265	305
TOTAL	940	800	938

*Source: Annex 2 of Contract No.6/2004 between Electrocentrale Turceni and Transelectrica*

The Secondary regulation services tariff equaled ROL 331,100/MWh or circa USD10/MWh (at the exchange rate of ROL 33,000 = US\$1 at 31/03/04). It was used as a reference rate when calculating tariffs for capacity reserve services.

**Spinning and Tertiary Slow Capacity Reserves:** System services contract annex 3 provided details of Turceni TPP capacity to provide spinning and tertiary slow reserves to Transelectrica. The table below provides a summary of commitments for spinning reserve capacities of Turceni TPP.

**Table 5.8: TTPP Spinning Capacity Reserves, by Unit**

Block No.	Qualified (Yes; No)	Available Capacity (MW)	MIN Capacity for Stable Operation (MW)	Range Continue Control of Active Power Output (MW)
Block No. 3	Yes	310	265	60
Block No. 4	Yes	325	270	55
Block No. 7	Yes	305	265	60
Block No. 1	No	310	265	60
Block No. 6	No	290	261	55
TOTAL		1,540	1,326	

*Source: Annex 3 of Contract No.6/2004 between Electrocentrale Turceni and Transelectrica*

At present unit 6 is qualified for a 305 MW spinning reserve capacity, raising the plant total to 1,555 MW. The table 5.9 provides a summary of slow tertiary reserve capacities of Turceni TPP.



**Table 5.9: TTPP Tertiary Slow Capacity Reserves, by Unit**

Qualified (Yes; No)	Available capacity (MW)	MIN capacity for stable operation (MW)	Time for cold start (min)	Time for warm start (min)	
Block no. 3	Yes	310	265	300	30
Block no. 4	Yes	325	270	300	30
Block no. 7	Yes	305	265	300	30
Block no. 1	No	310	265	300	30
Block no. 6	No	290	261	300	30
<b>Total</b>		1540	1326		

Source: Annex 3 of Contract No.6/2004 between Electrocentrale Turceni and Transelectrica

At present unit 6 is qualified for a 305 MW spinning reserve capacity, raising the plant total to 1,555 MW. In the absence of the regulator-approved system services tariffs, a provisional Procedure for the Monthly Allocation of System Services Payments – as approved by ANRE Decision No. 495/2001 - was used to calculate reference tariffs as shown in the table below. According to Articles 7.1 and 7.2 of the above procedure, the following reference tariffs applied to Turceni TPP capacity reserves.

**Table 5.10: TTPP capacity reserve tariffs (at the exchange rate of ROL 33,000 = US\$1 at 31/03/04)**

Capacity Reserve Type	Tariff ROL/MWh	Tariff US\$/MWh	% Secondary regulation reference tariff
Spinning Reserve	324,601	\$9.75	98%
Tertiary Slow Reserve	82,775	\$2.5	25%

Source: Annex 3 of Contract No.6/2004 between Electrocentrale Turceni and Transelectrica

Actual prices during 2004 were as follows:

- spinning reserve – 500,936 ROL/MWh (100% reference tariff of secondary regulation)
- tertiary slow reserve – 126,632 ROL/MWh (25.3 % of reference tariff for secondary regulation)

**Tertiary Slow Capacity Reserve:** Turceni TPP system services contract further provided an hourly schedule for 2004 tertiary slow reserve services indicating that, between 6 – 7 days (722 – 740 hours) per month, 280 MW would be reserved by Turceni TPP for this service. The following summary table of monthly estimated tertiary slow reserves corresponds to data specified in Annex 3 to the contract with the transmission operator.

**Table 5.11: Year 2004 TTPP Contracted Tertiary Slow Reserves (in GWh)**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
40.3	40.3	47.0	40.3	40.3	47.0	47.0	47.0	47.0	40.3	47.0	40.3	523.8

Source: Annex 3 of Contract No.6/2004 between Electrocentrale Turceni and Transelectrica



TTPP's estimated annual revenue from tertiary slow reserves was ROL 43,357,545,000 (or US\$1.3M).

**Spinning Capacity Reserves:** Annex 3 to the System Services Contract also provided an hourly, daily and monthly breakdown of spinning reserves, which the transmission operator estimates it may require during this year. The following is a summary table of monthly estimated spinning reserves as specified in the contract with Transelectrica.

**Table 5.12: Year 2004 TTPP Contracted Spinning Reserves  
(in GWh)**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
11.8	10.4	10.4	10.6	11.0	12.0	10.6	10.9	12.0	11.0	12.5	11.3	124.1

*Source: Annex 3 of Contract No.6/2004 between Electrocentrale Turceni and Transelectrica*

TTPP's estimated annual revenue from spinning reserves is ROL 40,282,984,000 (or US\$1.2M).

### Future Plans for System Services

Once TEC qualifies more of its generating units for various system services markets, it can enjoy an additional source of revenue, both on a contract basis and on the balancing market envisioned as part of the new electricity trading arrangements.

There are plans to create such a balancing market in 2005, in which un-contracted day-ahead capacities will be offered to the system operator and will supplement the already contracted (annually, monthly, daily) system services. The revised Commercial Code proposes a way for this market to function. By Addendum 3/12.29.2004 to the system services contract, parties (TEC and Transelectrica) have agreed the following:

- Extension of the contract validity up to 12.31.2005
- Introduction of values for electricity contracted for January-February 2005
- Introduction of quantities and countervalues of secondary regulation reserve frequency/power for January 2005: a band of 30 MW is offered for each IBD, with a monthly total of 22,320 hMW, at a reference price of 331.100 ROL/hMW
- Introduction of quantities and countervalues for spinning reserve for January 2005, values of 0, 10, 20, or 30 MW are offered for each IBD, totalling from 130 up to 720 hMW/day, a monthly amount of about 10,080 hMW, paid at a price of 324,061 ROL/hMW
- Introduction of slow tertiary reserve quantities and countervalues for January 2005, for 29 out of 30 days, one unit with an available power of 280 MW is offered in cold reserve, totalling 6720 hMW/day and 174.720 hMW/month, at a price of 82,775 ROL/hMW.

The total value of services contracted for the above mentioned modifications is 70,310,576,515 ROL, including VAT, out of which:

Countervalue of contracted electricity	33,959,940,000 ROL
Countervalue of contracted secondary control	7,390,152,000 ROL
Countervalue of contracted spinning reserve	3,271,978,080 ROL
Countervalue of contracted slow tertiary reserve	14,462,448,000 ROL
VAT	11,226,058,435 ROL



### ***Implementation of Provisions on Annual Lignite Quantity Restriction***

On January 5, 2005, Turceni Energy Complex received a letter from the Ministry of Economy and Commerce, stating that taking into consideration their request and for the application of the MEC's Order 668/2004, together with the provisions of the Regulations for Programming and Dispatching for the National Power System, art. 3.2.2, MEC assents to the established generation program and to the utilization of the lignite quantities requested for the accomplishment of the Winter Program 2004-2005' stipulations and of the aforementioned program, during January 1 – March 31, 2005, as follows:

**Table 5.13: Generation Program During January 1 – March 31, 2005**

Month	Coal quantity (natural tones)	Electric energy delivered into grids (MWh)
Jan	904,000	610,080
Feb	817,000	540,960
Mar	883,000	595,200
Total	260,400	1,746,240

The daily program of electric energy generation and lignite consumption for January 2005 indicates that based on a coal consumption of 29161 physical tones, the generated average power is 880 MW, corresponding to 21,120 MWh electric energy, leading to 820 MW average power delivered, corresponding to 19,680 MWh electric energy delivered. The daily program of electric energy generation and lignite consumption for February 2005 indicates that based on a coal consumption of 29,179 physical tones, the generated average power is 864 MW, corresponding to 20,734 MWh electric energy, leading to 805 MW average power delivered, corresponding to 19,320 MWh electric energy delivered.

The daily program of electric energy generation and lignite consumption for March 2005 indicates that based on a coal consumption of 28484 physical tones, the generated average power is 859 MW, corresponding to 20,605 MWh electric energy, leading to 800 MW average power delivered, corresponding to 19,200 MWh electric energy delivered.

### **Ash Sales**

In 2003 Turceni Thermal Power Plant launched a wet ash trading initiative; however the company's efforts had yielded insignificant results. Both Rovinari and Isalnita are possible competitors in this market. Rovinari was designed to provide dry ash from electrical filters instead of the ash-cleaning pit. Isalnita also has specialized bunkers below the electrostatic precipitators.

### **Heat Sales**

Turceni Energy Complex is also a provider of thermal energy. The table below presents the quantities and value of the heat sales for 2003 and 2004.

**Table 5.14: Quantities and Value of the Heat Sales for 2003 and 2004**

	2003	2004
Quantity (Gcal)	5,266	1.943
Value (ROL)	3,927,400,000	1.910.091.130



The main clients are EnergoConstructia Craiova, through its subsidiaries Turceni building site and Turceni colony, Turceni Hospital, Turceni industry vocational school, AF Flamion Com SRL, public services department of Turceni municipality.

All the contracts concluded between 2003 and 2004 stipulate that the clients should pay the bill within 10 days, otherwise penalties of 0.06% for every day of delay will be calculated after 30 days from the expiry date. After 30 days of penalties and with a prior notice of 10 working days, the supply of technological steam will be reduced to the technological minimum of the distribution network or will be stopped. Also, after 30 days of penalties and with a prior notice of 10 working days, the supply of domestic hot water will be reduced to 50%. The tariff for the thermal energy is the one established by ANRE for the thermal energy delivered by Electrocentrale Turceni / Turceni Energy Complex, for the related delivery period.

At the date of this report, for the year 2005, a single contract for thermal energy supply was concluded by the Complex with Turceni Local Council, for a quantity of 6,340 Gcal covering the centralized heating and hot water needs of Turceni commune. The regulated tariff, as approved by ANRE for Turceni Complex, would be applied.

## **MAIN SUPPLIERS**

### **Electricity Transmission**

The transmission services are provided by Transelectrica, the transmission system operator. The 2004 transmission contract No. C228/2003, signed on 19 December 2003 provided services for 6.6 TWh of electricity less 0.2 TWh for losses, or a total of 6.4 TWh, representing an estimated value of the contract for this year of US\$15M (or ROL 482,649,277,600) before VAT.

The contract tariff was of ROL 75,440 (or the equivalent of US\$2.3) per MWh at the time of contract signing (in accordance with ANRE 23/2003). The transmission tariffs have been revised since to ROL 90,290 (or the equivalent of US\$2.7) per MWh (in accordance with ANRE Order 36/2003), further replaced by 98,260 ROL/MWh = 2.97 USD/MWh (as per ANRE Order 11/2004).

According to the transmission contract, any tariff revisions by the electricity regulator are passed through without requiring any additional acts or other such contract amendments.

The transmission contract contains a clause regarding potential restructuring of the Turceni Complex. This clause states that in the event of the client-company restructuring into a number of companies, the contracted quantities will be transferred to these newly set-up entities on the basis of new transmission contracts entered into by Transelectrica and the newly set-up companies.

As part of the changes introduced by ANRE in the electricity market regulation in 2004, a new frame-contract for the services provided by Transelectrica (transportation, system services and electricity whole market administration) was approved through ANRE Order no. 40/2004. As a consequence, Turceni Complex has concluded a new contract with Transelectrica, Contract no. 885/12.29.2004, stipulating the conditions for receiving transportation and system services for the period January 1, 2005 –December 31, 2008.

## **RAW MATERIALS**

### **Fuels**

The Turceni Thermal Power Plant requires three types of fuel for its day-to-day operation:

- Lignite – main fuel



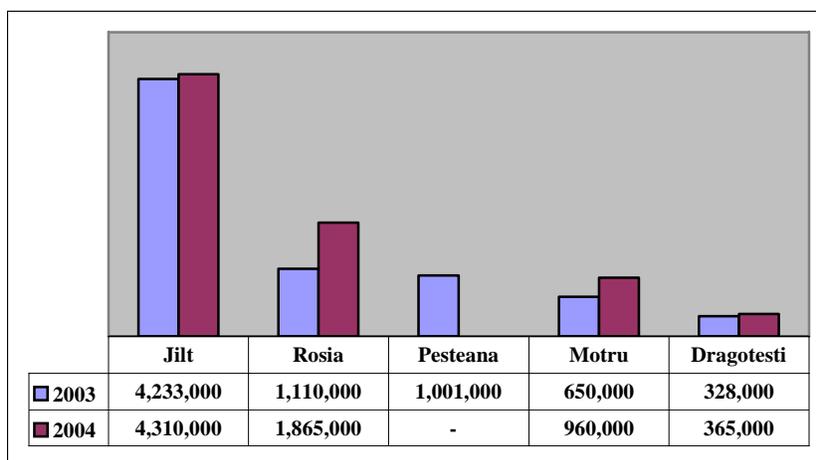
- Natural gas – start-up and flame support fuel
- Heavy Fuel Oil – start-up and flame support fuel.

### Lignite

The main fuel for Turceni TPP is indigenous lignite sourced from a number of open-pits and underground mines located at a distance of 25 – 85 km away from the plant (excepting Anina coalmine which is some 130 km far from Turceni but is a very small supplier, maintained for social reasons). The figure below illustrates annual quantities of lignite contracted by TTPP from the five coalmines in the National Lignite Company of Oltenia (CNLO) listed below for 2003 and 2004.

In 2003, Turceni Thermal Power Plant consumed about 8,865,586 tons of lignite (with an average calorific value of 7545 kJ/kg or circa 1800 Kcal/kg) in order to produce a total of 6,786 GWh. According to Turceni TPP management, lignite costs are about 50% of the plant’s total cost structure.

**Figure 5.3: TTPP Contracted Lignite Quantities (t) in 2003 – 2004**



Source: Annex 1 of Contracts No.6318/2004 and No. 396/2003 with CNLO

*Legend:*

- \* Rosia refers to both Cocoreni & Rovinari open-pit mines
- \*\* Motru refers to both the underground & open-pit mines.

Lignite supplied from the coalmines within the former CNLO (currently SNLO) is of low calorific value ranging from 1400 Kcal/kg to 2500 Kcal/kg. Turceni Complex generating facilities have been designed to use solely this type of low-calorific-value coal and there are no co-firing possibilities at present.

The table below shows the minimum, average and maximum calorific values of lignite for each of the above-mentioned coalmines.



**Table 5.15: Turceni Complex Lignite Supplies, by Coalmine and Calorific Value**

Name of Coalmine	Min CV (Kcal/kg)	Avg CV (Kcal/kg)	Max CV (Kcal/kg)
EMC <sup>3</sup> Jilt	1400	1780	2070
EMC Rosia	1550	1899	2250
EMC Pesteană	1550	1895	2250
EMC Motru	1400	1810	2170
EMS <sup>4</sup> Motru	1400	1760	2010
EMS Dragotesti	1700	1960	2100

*Source: Turceni Complex Management*

According to EMC Jilt management, lignite sourced from Jilt open-pit mines has the following technical specifications for a reference calorific value of 1700 Kcal/kg:

- Average sulfur content 1.8% (ranging from 0.6% to 2.4%)
- Humidity 41%
- Ash content 40.9%

Coal supply contracts are usually signed for one-year period. An average price in 2004 per Gcal in ROL was 255,730 or ca USD 7.75.

For year 2005, the quantity to be delivered by SNLO was established at 2,500 million tones, however the price is still under negotiation. The lignite price is based on a negotiation note, provided as an annex to the coal supply contract. Contract price excludes value-added tax and shipping charges, which are borne by Turceni Complex. Title transfer occurs with CNLO, now SNLO loading lignite into the wagons.

Invoicing takes place on a daily basis in accordance with the weighing certificate and contract price. Deviations in lignite quality from a baseline calorific value of 1700 Kcal/kg trigger the invoice adjustment on a monthly basis. Corrections can be made up to 2025 Kcal/kg as the maximum level. Quantities of coal with a calorific value below 1400 Kcal/kg will be paid at the rate of “10% of their determined calorific value”

Quality samples, consisting of three different elements - two for CNLO and TTPP, and a control sample to remain sealed for cases of a potential a quality dispute – are taken from every four wagons of each train. Quality control takes place at the supplier storage place in the presence of a representative of Turceni Complex and in accordance with SR ISO 1988/1996 quality norms. Complaints on the quality may be submitted within a pre-agreed time but no later than 20 days after the delivery and only when the actual calorific value determined by laboratory testing and certified by analysis bulletin differs by  $\pm 50$  Kcal/kg from the contracted values. In order to solve quality disputes, the control sample is unsealed and tested by a third (independent) laboratory agreed by both parties, while expenses related to such an additional testing are borne by the party at fault.

<sup>3</sup> EMC - open-pit mine  
<sup>4</sup> EMS - underground mine



The grain size of the delivered lignite is in the range of 0 – 150 mm. Lignite with a grain size of maximum 15% above standard prescriptions as specified in STAS 3228/83 and STAS 1308/90 is accepted. No metallic components are accepted, however, and lignite mines are responsible for carrying out maintenance of a metal extractor (where metal extractors are available) or installing such metal extractors (where not available). Lignite is delivered on the basis of supplier-issued certificates attesting product quality and quantity. Turceni Complex carries out the verification by weighing it in own installations and by quality testing of a sample taken in accordance with the quality standards mentioned above in own laboratories.

Coal delivery is done by train (also referred to as “lots”) of up to 2,500 tons per lot. Each lot consists of 40 to 50 wagons, 55-ton capacity each, supplying up to 2,500 tons of coal at once. SNLO as a coal supplier is obliged to deliver lignite to a buyer indicated as a final destination along with the corresponding invoice, weighing certificate, and shipment notice. The supplier will ensure the transportation means necessary for the contracted lignite quantity. In case of a heavy rain or snow or temperatures below –15°C, only freshly extracted (or dried in supplier storage) lignite can be transported to Turceni.

The following penalties are established by the coal supply contract:

- Failure to deliver or off-take delivery the scheduled quantities – penalties of 0.06% of the value of the quarterly undelivered lignite;
- Failure to settle an invoice within 30 days of the invoiced receipt - delay penalties of 0.06% of outstanding amount per day;
- Failure by supplier to ensure that delivered lignite is free of metallic components – penalties of 0.01% of the value of the lignite off-taken in the month, for quantities greater than 200 kg/month in which buyer detects a metallic composition.

In addition to the main contract with SNLO, the Complex also has a contractual relationship with SC Miniera Banat Anina SA (hereinafter “Anina”) mining company for the off-take of a small coal quantity extracted from the Ponor lignite mine located roughly 130 km away from Turceni. This coal supply contract, which values around US\$1M for 2004, serves a social assistance purpose for the Anina community.

It seems that due to the higher calorific value (>2100 Kcal/kg) of lignite supplied by Anina mining company to the Complex, its lignite needs to be mixed with the lower heat value coal in order to be used at Turceni. The commercial relationship with Anina will continue in 2005, based on the Contract no. 890/05.01.2005, which stipulates a quantity of 120,000 tons of coal, equivalent to 27,400 tcf, to be supplied at the negotiated price of ROL 263,402 (US\$ 9, at an exchange rate of 29,000 ROL/US\$) per Gcal. The gains from incorporating the lignite mines from EMC Jilt and EMS Dragotesti into the Turceni Energy Complex, due to the internal improvements of the mines’ activity, are estimated by the Complex management in average monthly savings of about ROL 10 bln.

The price of supplied lignite from associated mines is about 10% below the SNLO price. According to the Complex management, during April-October 2004, the average price of lignite from Jilt and Dragotesti was ROL 435,577 (US\$ 12.98) per ton while the coal from SNLO’s costs ROL 476,184 (US\$ 14.19) /ton. Monthly quantities and prices of the supplied lignite per supplier are provided in the following table showing the increase of quantities supplied by the associated coalmines and the price reduction.

**Table. 5.16: Quantities and Prices of Lignite by Suppliers**

SU	Apr		May		Jun		Jul		Aug		Sep		Oct	
	Q	Price												



	Apr		May		Jun		Jul		Aug		Sep		Oct	
Jilt+D	32	67	42	49	47	45	50	38	47	39	50	37	55	36
S	5	44	12	47	25	46	24	48	15	49	19	47	39	47
T	37		55		72		75		63		69		94	

### ***Lignite Transportation***

Turceni Thermal Power Plant has concluded the lignite transportation contract no. B 1.3/2003 with the National Railway Company for Freight Transportation – **CFR Marfa SA**. The contract was valid from April until December 31, 2003. According to the Turceni Complex management, lignite transportation costs are about 10 - 11% of the plant’s total costs. As indicated by the senior management, the total lignite transportation tariff, including associated tariffs, was equal to ROL 91,313 per ton, or the equivalent of USD2.77 at the exchange rate of USD1 = ROL 33,000. This tariff was determined on the basis of CFR Commercial Bulletin No. 10/2003.

Turceni Complex management reported a total of ROL 956bln (USD29M) in shipping charges during 2003. At year-end 2003, the company had settled 76% of its obligations towards the shipping company, CFR Marfa. The Client will benefit from the tariff discount related to level 3, i.e. over 400,000 tons of merchandise per year, and at the end of the contract a regularization of the transport fees, according to the level of discount for the realized tonnage will be done. The tariff discounts established by tonnage levels are granted with the first ton transported in accordance with the agreed tonnage level.

### ***Lignite Unloading***

There are two lignite unloading areas, consisting of 6 unloading decks, on the premises of Turceni Energy Complex:

- Stage I and stage II with 4 unloading decks; and
- Stage III with 2 unloading decks.

A memorandum entitled “Calculation of Unloading Capacity of the Industrial Railway Network of Turceni Energy Complex” was prepared and signed by the management of the Company’s Industrial Railway Network (CFU) and the management of the CFR Turceni Station. According to this memorandum, the lignite unloading capacity was calculated for the summer (April – October) and winter (November – March) periods and is provided for reference below:

**Table 5.17: Turceni Complex Lignite Unloading Capacity – Summer**

Summer	Stage I + II 1 Deck	Stage I + II Total	Stage III	Total
Train cars per day	130	520	240	760
Tons per day – in theory	7,150	28,600	13,200	41,800
Tons per day – in practice	5,500	22,000	10,154	32,154

*Source: Memorandum “Calculation of Unloading Capacity of the Industrial Railway Network of Turceni Energy Complex”*

**Table 5.18: Turceni Complex Lignite Unloading Capacity – Winter**

Winter	Stage I + II Total	Stage III	Total
Train cars per day	128	150	278
Tons per day – in theory	7,040	8,250	10,560
Tons per day – in practice	5,419	6,346	11,761

*Source: Memorandum “Calculation of Unloading Capacity of the Industrial Railway Network of Turceni Energy Complex”*

The tariffs for the loading/unloading service currently by Turceni Complex are shown in the table below:

**Table 5.19: Loading/Unloading Tariff in 2004**

Railway Station	Lignite Supplied By:	Tariff (ROL/t)
Dragotesti - Turceni*	Dragotesti, Jilt	110,200
Motru - Turceni	SNLO	132,500
Plopsor - Turceni	SNLO	110,130
Rovinari -Turceni	SNLO	113,620

*Note: Loading/unloading price from Jilt and Dragotesti is included in the internal price of the lignite*

*Source: Data provided by the Complex Management*

### ***Lignite Storage***

According to Turceni Complex management, the power plant is designed to store up to 1 million tons of lignite on its premises. An additional area suitable for further expansion of the lignite storage area is available on or around the premises of the power plant.

### **Natural Gas**

The natural gas supplier of Turceni Energy Complex is **Petrom SA** - the national oil company hereinafter referred to as “Petrom SA”. The Complex has a direct connection to Stoina extraction well instead of a connection through the national gas transportation network. The Complex has been an eligible natural gas consumer since 2003 and has re-validated its eligible status for year 2004. According to the gas regulator ANRGN Decision No. 974/2002, all eligible consumers must annually validate their eligibility status in order to meet respective requirements (satisfying credit worthiness and no outstanding debts to gas supplier).

Turceni Complex has an annual consumption of 180 million m<sup>3</sup> of natural gas, which the company purchases on annual contract basis from Petrom SA. According to the company’s management, natural gas costs are about 6% of the plant’s total cost structure. The 2003 Turceni Energy Complex – Petrom SA gas supply contract No. 5 SNP/2003 was extended until March 2005. The last addendum in 2004 cites a price increase, to ROL 3,383,415 (US\$ 166 at a ROL/US\$ exchange rate of 29,000) per 1000cm, starting with 1 October 2004. For 2004, the management estimated consumption of gas on at least 140 million m<sup>3</sup>



## CONTRACTS WITH THE ANRS (NATIONAL ADMINISTRATION FOR STATE RESERVES)

Turceni Energy Complex has to deposit, free of charge, for the National Public Administration for State Reserves, an annual quantity of 750,000 tons of lignite and of 8,500 tons heavy fuel. In December 2004 two contracts were signed by the Complex in order to allow borrowing a quantity of 600,000 tons of coal (Contract no. 154/2004) and of 7,000 tons of heavy fuel (Contract no. 153/2004). Borrowed quantities should be returned and the state reserves within a 90 days period.

### Heavy Fuel Oil

Turceni Energy Complex uses heavy fuel oil (HFO) with a minimum calorific value ranging between 9,200 and 9,400 Kcal/kg, and with 2% sulfur content for the power unit start-up and for flame support. In 2003, TTPP ordered a total amount of HFO equal to 6,597 tons (t), while the real consumption was 7490 t, with an average heat value of 38511 kJ/kg (9197 kcal/kg). The amount of HFO the company management estimated for 2004 was equal to 5,978 t, while the actual consumption was 8,740 tons.

According to the Company's management, HFO costs are less than 1% of the plant's total cost structure.

Turceni TPP used to supply HFO from Petrom SA Arpechim refinery on an as-needed basis. FOB price, excluding shipping charges is \$143.25 / t.

### *HFO Unloading*

There are two HFO unloading decks on the premises of Turceni Energy Complex directly connected to the dedicated railway lines. According to the same memorandum mentioned earlier in the section on lignite unloading HFO unloading capacity was calculated for the summer (April – October) and winter (November – March) periods. These unloading capacities are provided below:

**Table 5.20: Turceni Energy Complex HFO Unloading Capacity – Summer and Winter**

Description	SUMMER 1 Deck	SUMMER TOTAL	WINTER 1 Deck	WINTER TOTAL
Train cars per day	17	34	10	20
Tons per day – in theory	425	850	268	536
Tons per day – in practice	327	654	206	412

*Source: Turceni TPP memorandum "Calculation of Unloading Capacity of the Industrial Railway Network of Turceni TPP"*

### *HFO Storage*

Turceni TPP has the HFO storage capacity of 4 x 5,000 m<sup>3</sup> reservoirs.

## OTHER SUPPLIES

### Water

Turceni Energy Complex has contracted with the National Water Administration "Apele Romane – Directia Apelor Jiu" for raw water supplies to two different areas: (1) the thermal power plant for the needs of the technological process, and for (2) the hydro plant adjacent to the coal-based capacity.



## Raw water supplied to the thermal power plant

There is a contract in the data room between the Turceni Energy Complex and the National Water Administration “Apele Romane – Directia Apelor Jiu” (hereinafter called “Apele Romane”) for the supply of raw water for the electricity and heat generation in the power station, as well as for improvement of the raw water quality. The total value of the water supply contract for 2004 was ROL 49,441M (US\$ 1.5M). Raw water acquisition tariffs are set in accordance with GEO 107/2002 and are provided in the table below. Tariffs may be reviewed in accordance with existing regulations and with the approval of the Competition Council.

The total volumes of raw water, as well as yearly cost incurred are provided in the following table.

**Table 5.21: Turceni Energy Complex: 2004 Contracted Volumes**

What	Where From	Tariff (ROL/M.U.)	Volume	Cost (US\$'000)
H <sub>2</sub> O – technological	Jiu	265,608	159,377 thou mc	1,297.1
H <sub>2</sub> O – underground sources	Drillings	294,624	420 thou mc	3.8
Suspensions / Slurries	Jiu	59,148	159 tons	0.3
Fixed Residue	Jiu	242,172	318 tons	2.4

Source: Company Data

### **Raw Water Supplies to the TTPP-adjacent Hydro Power Plant**

Another water supply contract between TEC and **Apele Romane** is for raw water supply used in the electricity generation process at the four generating units of a hydro plant adjacent to Turceni TPP.

The annual value of the contract is ROL 484,860,000 or US\$15K. The tariff is equal to ROL 1 per m<sup>3</sup>. The quantity indicated in the Annex 1 to the contract equals 485 million m<sup>3</sup>. Apele Romane invoices based on the total operational time of Turceni TPP hydro units 1 - 4, as well as the water level afferent to the obtained average load.

### **ELECTRICITY FOR OWN CONSUMPTION**

SC Electrica Oltenia SA (hereinafter called “**Electrica Oltenia**”) supplies electricity to Turceni Energy Complex in the Turceni TPP consumption point, for its own technological use. The duration of the Supply Contract No. 20.25-10.31/2003 for 2004 and 2005 was extended through a special addenda.

Tariffs are regulated and set in accordance with ANRE Order 128/2002). According to Turceni TPP management, the power plant consumed about 113 GWh last year from the power grid for own consumption, compared to 118 GWh in 2002, and 107 GWh in 2001. The following table lists 2004 monthly contracted electricity quantities for own consumption.

**Table 5.22: Turceni Energy Complex: 2004 Contracted Electricity for Own Consumption**

#### **110 kV in GWh**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
11.0	10.6	8.6	8.4	8.8	9.2	9.3	9.3	9.8	10.0	10.5	11.8	117.3



### 20 kV in MWh

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1	3	5	5	5	3	3	3	3	3	3	3	13.4

*Source: Contract No20.25-10.31/2003 between Turceni Energy Complex and Electrica Oltenia*

### POWER SUPPLY TO COAL MINES

In June 2004, the Complex obtained the right to supply the Jilt and Dragotesti exploitations (accredited as eligible consumers) with electricity generated at Turceni TPP. For delivering the electricity from Turceni to the coalmines, transmission, distribution, system services and market administration are to be provided based on specific contracts. Distribution services are provided by Electrica Oltenia, based on the Contract no.12/ 07.01.2004.



## 6.0. TURCENI THERMAL POWER PLANT - TECHNICAL ASPECTS

### 6.1. Introduction

The Turceni Thermal Power Plant (Turceni TPP or TTPP) has been designed to operate in a base load within the Romanian Power System by using:

- Domestic lignite from the Oltenia coalfields as its main fuel
- Natural gas and fuel oil as start-up or support fuel.

Turceni TPP was designed for 8 power generation units, each with an installed power of 330 MW. Table 1 is presenting some general information about TPP operational capacity.

**Table 6.1: General Information About Turceni TPP Power Generation Units**

Unit no.	Commissioning year	Current status
1	July 1978	In operation
2	August 1979	Withdrawn from operation (partial dismantling)
3	August 1980	In operation
4	December 1981	In operation (recently rehabilitated)
5	August 1983	Under rehabilitation until December 2005
6	September 1985	In operation
7	November 1987	In operation
8	Not completed	Mothballed

The technology used for all the units is an under-critical Hirn - Rankine cycle provided with intermediate steam reheating. Units 1 – 7 are conceived for a block system functioning-boiler, turbine, and generator.

### 6.2. Power Generation Assets

The power generation assets include the steam boiler and boiler auxiliary machinery and the steam turbine and turbine auxiliary machinery. These components are placed in the main building of the TPP, which has a surface area of about 60 000 m<sup>2</sup>. Figure 6.1 presents the cross section of the main building.

## TECHNICAL CHARACTERISTICS

### Steam Boiler (Units no. 1 – 7)

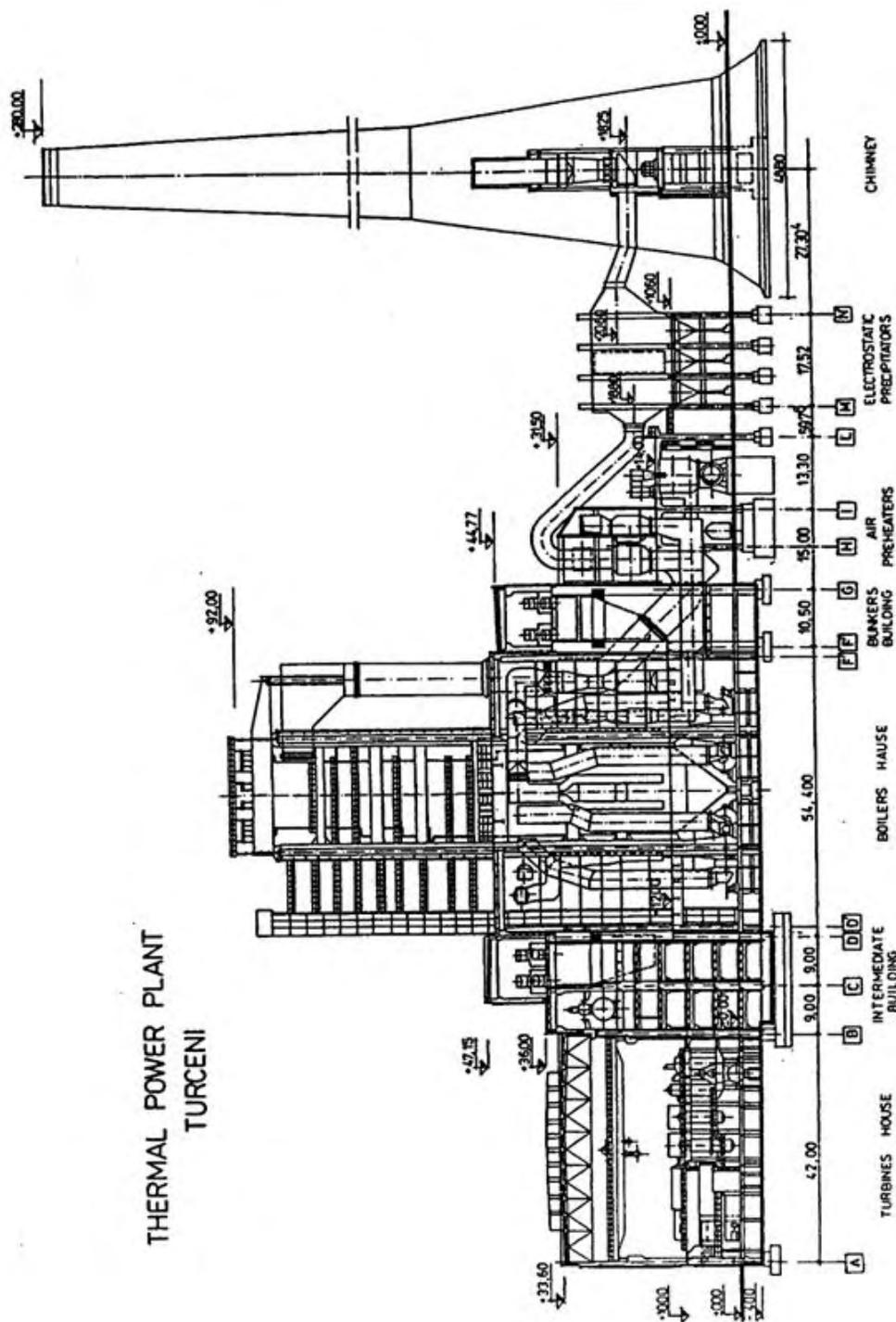
The boiler, with unique forced crossing (Benson type), was manufactured by Vulcan Bucharest after a Deutsche-Babcock license. It has been designed as a tower-type construction over 92 meters high (single flue gas path), which represents the optimal solution for the combustion of a solid fuel with high ash content. It has one upward flue gas path in which are placed all the heat transfer surfaces (economizer, vaporizer, overheater, intermediate re-heater). From the upper side of the boiler the flue gas is directed



through a downward channel/duct to the ground level where are located the Ljungstrom rotating air pre-heaters and the dust filters (electrostatic precipitators).

The lowest point of the vaporizer hopper is at +2.60 m while the highest point of wall- super-heater no.1 is at 85.0 m. The total thermal expansion (dilatation) downwards is 420 mm for the nominal load.

**Fig. 6.1: Cross-section of the Main Building**





The furnace and convection area has membrane walls. The vaporizer pipes are the furnace walls and a part of the high-pressure over-heater forms the walls of the convection area. The other part of the high-pressure over-heater, the intermediate re-heater and the economizer are made of tube bundles that are supported by the upper part of the boiler through pipe risers (part of high pressure over-heater). The cleaning of the convective heat exchangers is done by a steam blower.

The tower-type boiler has a variable section from the lower to the upper point and runs into a narrowing of the cross-section for the front and back walls, where the furnace joins the convection area. This throttle is reducing the boiler thermal expansion and induces high thermal pressure. The furnace has its lower part in a funnel form for its connection to a post-burning grate and to the ash/slag conveyor. This conveyor evacuates slag and ashes from the coal burning.

Table 6.2 provides the key nominal technical data of the steam boiler and Table 6.3 presents the functioning time from the commissioning date until December 2004 for each boiler still in exploitation..

**Table 6.2: Steam Boiler Key Nominal Technical Data**

Parameter	Units no. 1, 3, 6, 7	Unit no. 4
HP (high pressure) part steam flow, t/h	1,035	1,035
HP part steam outlet (live steam) pressure, bar	192	192
HP part maximum allowed steam pressure, bar	212	212
HP part steam outlet (live steam) temperature, °C	540	540
IP (Intermediate pressure) part steam flow, t/h	974	974
IP part steam inlet (cold reheat steam) pressure, bar	50.1	50
IP part steam outlet (hot reheat steam) pressure, bar	48.2	48
IP part maximum allowed steam pressure, bar	65	65
IP part steam inlet (cold reheat steam) temperature, °C	348	348
IP part steam outlet (hot reheat steam) temperature, °C	540	540
Feed water inlet temperature, °C	260	260
Feed water inlet pressure, bar	246	246
Lignite consumption, t/h	approx. 470 t/h	approx. 450 t/h
Efficiency rate (on lignite combustion), %	87.5	90.5

**Table 6.3: Boiler Functioning Time**

Boiler	Functioning Time Until 12/31/2004
1	88,735
3	100,576



Boiler	Functioning Time Until 12/31/2004
4	53,306
5	27,218
6	68,894
7	75,074

Table 6.4 presents the average boilers efficiencies for years 2003 and 2004.

**Table 6.4: Average Boilers Efficiencies for Years 2003 and 2004**

Boiler no.	Efficiency, % During 2003	Efficiency, % During 2004
1	87.09	86,80
3	87.85	87,59
4	88.65	88,53
5	-	-
6	86.35	86,39
7	87.05	86,78

### Steam boiler Auxiliary Machinery

#### *Combustion System*

Each boiler has 6 coal burners (slit type), 4 combined fuel oil – natural gas burners and 8 fuel oil burners. For boilers no. 1, 3, 6 and 7 the coal burners are divided in two parts: an upper and a lower part. The fuel oil and natural gas burners are placed on three levels. The fuel oil burners (operating separately) can assure the boiler operation up to 50 % of the nominal load. The coal is milled in 6 coal mills (each corresponding to one coal burner) providing with simultaneous drying, milling and sorting of the coal.

The mills are fan type equipped with hammers. At nominal load only five mills are working and one mill is kept in reserve. The coal is dried by flue gas drawn from the upper part of the furnace. An electric engine is moving each coal mill using for it an integrated variable-speed hydraulic coupling with a reduction gearbox. In Units No.1 & 6, the hydraulic coupling and gearbox are different installation while in the Unit No.3; 4; 5 and 7 these components form a single unit. The rotor shaft is cooled by water. The big size particles are returned in the inlet duct by a gravitational separator (classifier).

#### *Coal Feeders*

Each coal mill is equipped with an apron-belt conveyor that takes the coal from the coal storage. Each conveyor has a driving unit with variable-speed actuator. A paddle shaft that operates at the discharge end of the conveyor adjusts the height of coal layer.



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### ***Air Fans***

For each boiler there are two horizontal forced-draught air fans working in parallel to provide the needed combustion air. The fans are axial type with adjustable inlet guiding blades that allow the airflow control. In the fan suction a sound attenuator is provided. An air re-circulation line from the air discharge duct to the air suction duct prevents the surging flow during start-up. An air re-circulation line from the air outlet duct of the rotary air pre-heater to the air fan suction duct prevents the dew point in the rotary air preheater.

### ***Air Pre-heaters***

Before the boiler inlet, two rotary air pre-heaters (Ljungstrom type) are working in parallel to preheat the air. During the operation the inlet air temperature can be raised with hot air drawn from the exhaust of regenerative air preheater. For unit No. 4, when using fuel oil with high sulphure content, the combustion air is supplementary preheated in two parallel steam – air heat exchangers. The goal is to avoid dew point and the corrosion of the air pre-heaters metallic surfaces.

### ***Flue Gas Fans***

The flue gas is exhausted from the boiler by two induced-draught fans (axial type) installed as a duplex unit. The fans are axial type with adjustable inlet guide blades that allow the flue gas flow control. The lower bearing is a radial-axial bearing, with tilting pads. The upper bearing is radial bearing placed inside the flue gas de-fusser. The upper bearing is air cooled by a forced draught fan.

### ***Electrostatic Precipitators***

For reducing the dust emission the boiler is equipped with two electrostatic precipitators, each filtering half of the flue gas flow. In order to assure good pollutants dispersion the flue gases are exhausted into the atmosphere through chimneys (1 chimney for two units) having a height of 280 meters. At present, the plant has 4 such chimneys.

### ***After-Burning Grate***

The after-burning grate extends the burning time of coal particles and improves the boiler efficiency as well as the furnace flame stability. It includes two moving grates that are running in opposite direction. Each moving grate has a driving unit (with two speeds) and a tensioning unit. The low speed is 12 m/h and the high speed is 24 m/h.

### ***Ash/Slag Conveyor***

The ash/slag conveyor is an apron-belt conveyor, immersed in water and that discharges the slag into two hammer-crushers.

### **Steam Turbine**

The steam turbine is a condensation type turbine, model F1C – 330, with condensation and a single steam reheating. It was made by IMG Bucharest, after a Rateau – Schneider license. Figure 6.3 presents the thermal diagram of the turbine installation. The steam turbine has four parts, a single row of shafts and a single condenser: A high-pressure part (HPP) – double casing type - has 11 impulse stages (first of them is the governing stage). A medium pressure part (MPP) – double casing type - has 13 impulse stages. Two low-pressure parts (LPP), each with two opposite-flows and 6 impulse stages for each flow.



The high pressure and the medium pressure flows have contrary directions, as well as the flows of each low-pressure flow. This provides a good balance of thrust forces and consequently a moderate load on the turbine thrust bearing. The main technical features of the steam turbine are presented in Table 6.5.

**Table 6.5 -Key Technical Features of the F1C-330 Steam Turbine  
(for a Cooling Water Temperature of +15 °C)**

Maximum continuous power, MW	330	
Optimum running power, MW	315	
Overload power, MW	345	
Rotation speed, rpm	3000	
Load	300 MW	315 MW
HPP inlet steam flow, t/h	984	926
HPP inlet steam pressure, atm	186	
HPP inlet steam temperature, °C	535	
HPP outlet steam pressure, atm	49.8	47.2
HPP outlet steam temperature, °C	344	335
HPP outlet steam flow towards the boiler re-heater	921	863
MPP inlet steam flow, t/h	921	863
MPP inlet steam pressure, atm	45.8	43.1
MPP inlet steam temperature, °C	535	
LPP outlet flow, t/h	592	562
LPP outlet pressure, atm	0.038	0.036
LPP outlet steam, %	90	
Feed water preheating temperature, °C	264	260

For preheating the boiler feed-water the turbine has 7 steam extractions lines (SEL) (bleedings).

### ***Lubricating Oil System***

The lubricating oil system provides the lube oil to the turbine and generator bearings. The lube oil system provides also an emergency supply to the generator sealing oil system. The HP turbine rotor drives a main oil pump through a tooth-gear. The main oil pump has been manufactured by AVERSA- Bucharest, after a Rateau license. The turbo-pump is of a vertical design and is mounted on top of the lube oil tank. The oil discharged by the main oil pump enters a single-stage centrifugal turbine and then flows into the lube oil supply header and is used for bearing lubrication. The oil turbine drives a double-stage centrifugal pump. The booster pump supplies the suction line of the main oil pump. The turbo-pump has been manufactured by AVERSA- Bucharest, after a Rateau license.

The low-pressure pump provides the lube oil when the discharge pressure of the main oil pump is too small, i.e. during the steam turbine start-up and shutdown. The pump is a double-stage centrifugal type, of a vertical design and is mounted on top of the lube oil tank. The pump is driven by an AC electrical motor. The LP start-up pump has been manufactured by AVERSA- Bucharest, after a Rateau license.

The emergency lube oil pump is a single-stage centrifugal type, of a vertical design and is mounted on top of the lube oil tank. The pump is driven by a DC electrical motor. The emergency lube oil pump has been manufactured by AVERSA- Bucharest, after a Rateau license.



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### ***Centrifugal Separator***

A centrifugal separator is an Alfa-Laval centrifugal separator, with a flow of 3600 l/sec and discharge pressure of 15 m; it performs removal of water and solid suspensions. During the steam turbine operation the control oil is delivered by the main oil pump. The high pressure start-up pump provides the control oil when the discharge pressure of the main oil pump is too small, i.e. during the steam turbine start-up and shutdown. The pump is a double-stage centrifugal type, of a vertical design and is mounted on top of the lube oil tank. The pump is driven by an AC electrical motor. The HP start-up pump has been manufactured by AVERSA- Bucharest, after a Rateau license.

### **Steam Turbine Auxiliary MACHINERY**

#### ***Feedwater Preheating System***

The steam turbine circuit has the following feed-water pre-heaters.

#### ***High & Low Pressure Pre-heaters (HP-Pr and LP-Pr)***

There are three HP-Pr and LP-PR (surface type) pre-heaters. Before entering in pre-heater no. 6, the steam is cooled in water – steam heat-exchanger placed downstream of pre-heater No. 7, just before the feed water inlet into the Steam boiler.

#### ***Deaerator***

There is one a mixing type low-pressure pre-heater, called de-aerator. It is used for feed-water de-aeration or removal of dissolved gases. This de-aerator is fed with steam from the 4<sup>th</sup> steam extraction line during the main turbine operation. The de-aerator is installed on the feed-water tank that has a volume of 208 m<sup>3</sup>.

#### ***Feed Water Pumps***

There are 3 pumps to provide the boiler with feed-water: a main pump (1 x 100 % flow) driven by a turbine that is fed with steam from the 5<sup>th</sup> extraction line of the main turbine and duplex two pumps, (2 x 50% flow), that are driven by electrical motors. These two pumps are stand-by pumps and are mainly used for start-up or for partial load operation. The electrical motor nominal power is 7200 kW. The steam turbine that is driving the main feed-water pump is a condensation type turbine (RC-12 model), having 8 impulse stages, manufactured by IMGB Bucharest, after a Rateau-Schneider license. At low partial loads this steam turbine could be fed from the high-pressure steam pipes (live steam).

#### ***Main Condensate Pumps***

There are two pumping stages for the main condensate extracted from the Main Condenser, each stage having 2 x 100 % pumps (one pump in operation and one in reserve). The pumps were manufactured by AVERSA- Bucharest (Pumps Factory) after a Rateau-Schneider license.

#### ***Main Steam Turbine Condenser (Main Condenser)***

There is a single condenser located below the two LPPs of the steam turbine.-The condenser is a surface heat-exchanger with one passing on the cooling waterside.



### ***Vacuum Installation***

Initially the units were equipped with water-ring vacuum pumps (SCAN-LEBLANC 21 model). For start-up a hogging-up steam ejector was provided. Meanwhile this was abandoned mainly due to the lack of spare parts for the vacuum pumps. At present units no. 1, 3, 6 and 7 are provided with steam ejectors fed with 9 bar steam (1 single-stage starting ejector and 3 three-stage ejectors mounted in parallel for normal operation). Unit no. 4 (modernized) is equipped with motive-water ejectors (manufactured in Germany). The needed water is taken from the cooling pumps outlet.) For start-up a hogging-up steam ejector is used, the same model as those used for units 1, 3, 6, and 7.

### ***Condenser Cooling Pumps***

The condenser cooling pumps are vertical pumps, single-stage, axial-flow type, manufactured by AVERSA Bucharest (AV 1202 model). The impeller blades angle can be adjusted.)-There are 2 pumps in parallel, each delivering 50 % of the required flow, driven by electric motors. These pumps provide the cooling water for the main turbine condenser, as well as for the condenser corresponding to the main feed-water pump driving turbine. There are also other auxiliary cooling exchangers connected to these pumps circuit (e.g. oil coolers).

The same pump type is used for assuring the water circulation to the cooling towers.

### ***Electrical Generator***

The F1C – 330 steam turbine is connected through a rigid coupling to a THA – 330 – 2 type electrical generator (Alsthom – license). The generator rotor winding and the stator magnetic core are cooled by hydrogen (98 % purity) while the winding stator is cooled with de-mineralized water.

**Table 6.6: Electrical Generator Type THA 330–2 – Key Technical Data**

<b>Parameter</b>	<b>Value</b>
Nominal active power, MW	330
Nominal apparent power, MVA	388
Maximum apparent power, MVA	405
Power factor	0.85
Frequency, Hz	50
Nominal voltage, kV	24
Rotation speed, rpm	3,000

The Generator has been manufactured by the former IMGB-Power Generation Equipment Factory - presently General Turbo Bucharest. The excitation current is provided by an auxiliary synchronous generator (TE-1,2-2), 1.2 MW that is direct driven by the generator shaft. The outlet voltage is evacuated to a Static Excitation Unit



## Power Transformers

### *Units' Step-Up & Step –Down Power Transformers*

Each power unit has its own step-up power transformer linked to the generator terminals. All of them are almost similar. The power supply for each unit related ancillaries, while the unit is in operation, is made through an ancillary power circuit by means of: one piece - step–down power transformer (1x40 MVA, 24 / 6.3 kV) for Units No. 1 and No. 3, and two pieces - step–down power transformers (2 x 25 MVA, 24 / 6.3 kV) for Units No. 4, 5, 6 & 7. .

## Operational Performances

### *Output- Efficiency Measures*

**Table 6.7: Unit no. 1**

Year	Produced electricity, MWh	Own electric consumption, MWh	Average produced power*, MW	Average net efficiency	
				%	gcc/kWh
2004	572,659	36,944	271	30.4	403.7
2003	1,400,443	100,797	288	30.4	404.0
2002	916,396	58,786	279.6	29.7	413.5
2001	1,295,419	76,888	273.7	30.3	405.3

*\* Relative to the functioning time*

**Table 6.8: Unit no. 3**

Year	Produced electricity, MWh	Own electric consumption, MWh	Average produced power*, MW	Average net efficiency	
				%	gcc/kWh
2004	1,449,584	104,155	272	30.4	404.5
2003	1,168,002	80,855	284.7	31.1	392.0
2002	969,111	64,753	279.0	30.7	400.0
2001	1,453,361	105,588	270.5	30.1	408.7

*\* Relative to the functioning time*

**Table 6.9 - Unit no. 4**

Year	Produced electricity, MWh	Own electric consumption, MWh	Average produced power*, MW	Average net efficiency	
				%	gcc/kWh
2004	1,689,450	113,316	288	31.7	387.3



				Average net efficiency	
2003	2,031,662	135,531	295.8	31.99	384.5
2002	1,193,615	73,896	298.7	31.98	384.7

*\*Related to the functioning time*

**Table 6.10: Unit no. 6**

Year	Produced Electricity, MWh	Own Electric Consumption, MWh	Average Produced Power*, MW	Average Net Efficiency	
				%	gcc/kWh
2004	630,134	45,567	259	30.0	410.2
2003	1,015,973	76,041	276.0	30.0	408.7
2002	1,132,326	81,289	276.7	30.0	409.3
2001	1,269,038	82,414	275.7	30.0	409.8

*\* Relative to the functioning time*

**Table 6.11: Unit no. 7**

Year	Produced Electricity, MWh	Own Electric Consumption, MWh	Average Produced Power*, MW	Average Net Efficiency	
				%	gcc/kWh
2004	1,322,959	86,225	277	30.7	400.0
2003	1,170,040	84,283	274.8	30.4	404.3
2002	1,582,614	105,572	279.3	30.2	407.3
2001	1,159,720	75,248	278.2	29.9	410.5

*\* Relative to the functioning time*

**Availability - Utilization and Load Factor**

- -Time availability (%) = (Functioning time + Reserve time)/Calendar time \* 100
- -Utilization Factor (%) = Produced electricity/(Calendar time \* Maximum possible output) \* 100
- -Load Factor (%) = Produced electricity/(Functioning time \* Maximum possible output) \* 100

**Table 6.12: Unit no. 1**

Year	Maximum possible output, MW	Time availability, %	Utilization factor, %	Load factor, %
2004	310	71.9	21.0	87.4
2003	310.0	86.3	51.6	92.9



Year	Maximum possible output, MW	Time availability, %	Utilization factor, %	Load factor, %
2002	296.9	56.6	35.2	93.8
2001	306.0	69.0	48.3	89.4

**Table 6.13: Unit no. 3**

Year	Maximum possible output, MW	Time availability, %	Utilization factor, %	Load factor, %
2004	310	77.9	53.2	87.6
2003	310	68.1	43.0	92.1
2002	310	58.0	35.7	90.0
2001	306	71.7	54.2	88.4

**Table 6.14: Unit no. 4**

Year	Maximum possible output, MW	Time availability, %	Utilization factor, %	Load factor, %
2004	314.5	81.2	51.2	91.4
2003	315	83.4	73.6	94.1
2002	315	50.9	43.2	94.8

**Table 6.15: Unit no. 6**

Year	Maximum possible output, MW	Time availability, %	Utilization factor, %	Load factor, %
2004	298.1	57.1	24.1	86.9
2003	303.7	78.4	38.2	90.5
2002	305	75.0	42.4	90.7
2001	306	66.7	47.3	90.1

**Table 6.16: Unit no. 7**

Year	Maximum possible output, MW	Time availability, %	Utilization factor, %	Load factor, %
2004	305	79.5	49.4	90.9
2003	305	69.2	43.8	89.9



Year	Maximum possible output, MW	Time availability, %	Utilization factor, %	Load factor, %
2002	305	85.5	59.2	91.6
2001	308	51.4	43.0	90.3

## FUEL

### Lignite

The lignite originates mainly from the Oltenia coalfield. Table 6.17 presents the design lignite composition for the Turceni units.

**Table 6.17: The Lignite Composition Anticipated by the Original Design for the Turceni Units**

Component	Minimum Value	Maximum Value
Total humidity, %	41.0	45.0
Ash, %	23.5	25.0
Carbon, %	18.3	21.9
Hydrogen, %	1.7	2.0
Sulphure, %	0,7	0.8
Nitrogen + Oxygen, %	8.8	10.3
LHV, kcal/kg	1,400	1,800

After rehabilitation, for boiler no. 4 was recommended the composition presented in Table 6.24.

**Table.6.18: Lignite Composition Recommended after Rehabilitation for Boiler no. 4**

Component	Minimum value	Maximum value
Total humidity, %	38,7	47,3
Ash, %	21,6	26,4
LHV, kcal/kg	1550	1700

**Table 6.19: Average Values Reached During 2003 and 2004 by the Lignite LHV, kcal/kg**

	Boiler no. 1	Boiler no. 3	Boiler no. 4	Boiler no. 6	Boiler no. 7
Average 2003	1809	1805	1805	1804	1786
Average 2004	1782	1769	1810	1740	1796



## Fuel Oil

The fuel oil LHV imposed by the original design is 9500 kcal/kg, with a sulphure content of 3,3 %. At present the fuel oil is delivered by PETROM (ARPECHIM Pitesti subsidiary) having a LHV of 9780 kcal/kg and a sulphure content of 1,02 %.

## Natural Gas

At present the natural gas is delivered by PETROM from the nearby oil field Ticleni (Stoina).

## Fuel Consumption

**Table 6.20: Fuel Consumption - Unit no. 1**

Year	Lignite, tones	Natural gas, thousands m <sup>3</sup>	Fuel oil, tones
2004	787,394	12,069	1,433
2003	1,852,404	39,606	1,060
2002	1,273,238	27,037	1,610
2001	1,744,601	48,723	1,796

**Table 6.21: Fuel Consumption - Unit no. 3**

Year	Lignite, tones	Natural gas, thousands m <sup>3</sup>	Fuel oil, tones
2004	2,005,171	30,380	1,839
2003	1,522,558	31,205	1,018
2002	1,289,171	31,442	516
2001	1,982,482	46,230	1,692

**Table 6.22: Fuel Consumption - Unit no. 4**

Year	Lignite, tones	Natural gas, thousands m <sup>3</sup>	Fuel oil, tones
2004	2,268,876	18,205	2,094
2003	2,606,380	47,070	2,001
2002	1,549,036	28,618	1,492

**Table 6.23: Fuel Consumption - Unit no. 6**

Year	Lignite, tones	Natural gas, thousands m <sup>3</sup>	Fuel oil, tones
2004	887,801	14,783	1,521



Year	Lignite, tones	Natural gas, thousands m <sup>3</sup>	Fuel oil, tones
2003	1,369,760	25,109	1,626
2002	1,518,117	38,148	1,089
2001	1,713,384	47,034	1,685

**Table 6.24: Fuel Consumption - Unit no. 7**

Year	Lignite, tones	Natural gas, thousands m <sup>3</sup>	Fuel oil, tones
2004	1,793,250	32,730	1,853
2003	1,518,248	42,443	1,785
2002	2,122,149	56,129	927
2001	1,560,352	47,698	893

### Atmospheric emissions

Table 6.25 presents the atmospheric emissions for year 2004.

**Table 6.25: TPP Turceni Atmospheric Emissions for Year 2004**

Unit. No.	SO <sub>2</sub> , mg/Nm <sup>3</sup>	NO <sub>x</sub> , mg/Nm <sup>3</sup>	Dust, mg/Nm <sup>3</sup>
1	3507 – 4447	259 - 431	105 - 143
3	3852 – 4915	433 - 487	97 - 138
4	3861 – 4860	422 - 468	85 - 100
6	3363 – 4830	329 - 489	108 - 132
7	3553 – 4843	421 - 492	110 - 133

**The Project for Installing Four Flue Gas Desulphurisation Units (“FGDs”):** In accordance with GD 1637/7.10.2004, published in Official Journal No 951/18.X.2004, the Romanian Government has approved the technical-economical indicators of the project “Installation of flue gas desulphurisation units at energy blocks 3, 4, 5, 6 at the Commercial Society Turceni Energy Complex”, with financing ensured from own sources and a loan from the Japanese Bank for International Cooperation (JBIC).

The feasibility study that was the basis for the approval was elaborated by the Institute for Power Studies and Design (ISPE) Bucharest. The wet limestone technology is proposed for its higher efficiency. Below are presented some synthetic benchmarks of the investment project:

Loan amount is ¥ 28,746,000,000 (ca USD 261 million) and it will be supplemented by ca USD 85 million contribution of the Romanian side. The total amount includes some amount for construction and installation works. The implementation of that investment project will take about 80 months.



The approximated (in 000s ROL) schedule of the project implementation is presented below (total amount / out of which construction works).

Year 1	26,162,656 /-
Year 2	118,162.,918 /-
Year 3	2,158,477,733 /-
Year 4	2,884,646,581 / 168,293,440
Year 5	4,241,496,191 / 662,743,420
Year 6	2,068,918,312 / 1,568,096,690
Year 7	794,214,707 / 745,714,990

Total SO<sub>2</sub> retained yearly by the FGDs: 172,848.48 tons

Total annual production costs generated by the installation: 1,530,656,915,000 ROL; electricity supplied by units 3, 4, 5, 6 after installation of FGDs: 8,001,790 MWh/year; increased unit cost due to installation of FGDs: 191,289 ROL/MWh (4.73 EURO/MWh)

### **6.3. Fuel Handling**

#### **HANDLING OF LIGNITE**

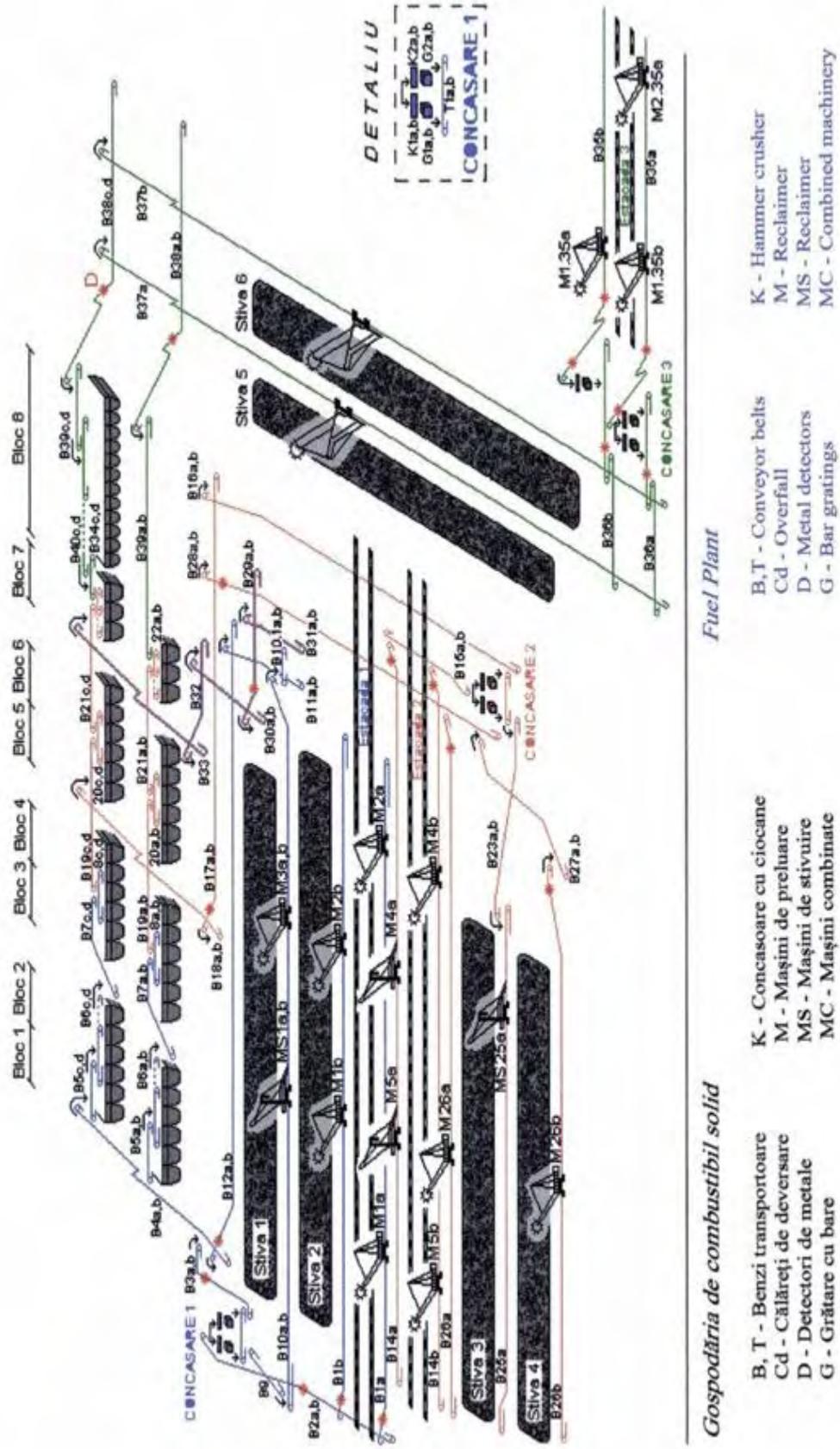
Lignite supply is made by railway with self-unloading wagons (55 tones). After weighting, the wagons are driven to the unloading ramps (of 700 m length). The power plant has three unloading ramps, each one having two railways lines. Each railway line is able to unload 42 wagons at the same time. During winter, when outside temperature is below 0°C, before unloading the lignite wagons are defrosted in three tunnels by using hot air.

After unloading the lignite is taken by 11 machines (equipped with bucket rotor – each with a nominal coal flow of 1200 t/h) and transported with belt conveyors to 3 crushing stations (each with a maximum coal flow of 1200 t/h). After crushing (to 30 mm size) the lignite is directed to the mill bunkers or to the 6 storage areas. 4 machines (each with a nominal coal flow of 1200 t/h) realize the lignite storage and, when needed, other 5 machines (equipped with bucket rotor – 4 with a nominal coal flow of 1200 t/h and 1 with 2400 t/h) are able to take the lignite from the storage and to send it to the mill bunkers.

102 belt conveyors are used to the lignite transport inside the power plant. 42 devices for detecting ferrous metals and 30 metal separators are placed on the belt conveyors lines. The coal storage capacity can assure the power plant nominal consumption for about 30 days.



Figure 6.2: Solid Fuel Handling System – Source – Turceni Energy Complex Management





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## HANDLING OF FUEL OIL

Fuel oil supply is realized by using two railway tank-wagon types: 50 tones/tank and 30 tones/tank. The unloading ramp is able to unload simultaneously 28 wagons. Fuel oil storage capacity is 16 000 tones (4 underground tanks x 4000 tones). There are two pumping stages. The 4 pumps from the 1<sup>st</sup> stage (gear pumps, DL13 type) are forwarding the fuel oil from the storage tanks to the boilers area. The 1<sup>st</sup> pumping stage involves also 2 pumps (gear pumps, DL13 type) for unloading the railway wagons. The 2<sup>nd</sup> pumping stage provides the injection of the fuel oil into the boilers at the necessary parameters.

In order to have the necessary viscosity the fuel oil is preheated by using steam. Contrary to other units, unit No.4 (and in the near future also unit No. 5) has a supplementary heat exchanger mounted at the 2<sup>nd</sup> pumping stage discharge.

## NATURAL GAS

The natural gas supply is performed using two pipes and a pressure reduction and control station. The power plant does not have capacities for natural gas storage. The maximum natural gas flow through the two pipes is 50 000 Nm<sup>3</sup>/h.

### 6.4. Cooling System

The water source for TPP Turceni is the Jiu River. There are two possibilities for providing the necessary cooling water: The dam and the old water intake that can provide a flow of around 96 m<sup>3</sup>/s (at present this is a reserve option). The hydro power plant built at 3,5 km upstream to the power plant, with a maximum capacity (water flow) of 18 m<sup>3</sup>/s (at present in operation). The Turceni TPP can operate in a combined circuit or in closed circuit in compliance with the available water flow of the Jiu River. In closed circuit, seven cooling towers perform the cooling. Four cooling towers assure the cooling water for units Nos. 1÷4, and the other three for units Nos. 5÷7.

The needed cooling water per 1 unit is 12 m<sup>3</sup>/s when the system operates in open circuit and 0,75 m<sup>3</sup>/s when is functioning in closed circuit. The cooling towers are with natural-draught in counter-flow, having a 115 m height and a capacity of about 40 000 m<sup>3</sup>/h.

### 6.5. Hydro Power Plant Turceni

As mentioned before, the hydro power plant (HPP) is placed 3,5 km upstream to the thermal power plant. The HPP has 3 blocks: the 1<sup>st</sup> block contains the by-pass gallery; the 2<sup>nd</sup> block contains a 1 MW hydropower unit (HG1), and the 3<sup>rd</sup> block contains 3 hydropower units, each with output of 4 MW (HG2 – 4). The hydropower units were commissioned in October 1989 (HG1 with normal operation from July 1991), in July 1991 (HG2 with normal operation from July 1993), and in July 1991 (HG3 with normal operation from January 1993) with HG4 commissioned in December 1991 (normal operation from January 1992). Tables 6.26 present the key technical characteristics of the hydropower units and Table 6.27 presents the HPP electricity production in 2001 – 2004.

The power evacuation is through two step-up voltage transformers, each of them corresponding to two hydropower units. These transformers have a nominal apparent power of 10 MVA and a transformer ratio of 22 kV/6,3 kV. After that, through a 20 kV double circuit the power is evacuated to Sardanesti electric station. The own electric consumption of the HPP is assured by two transformers (one in operation and the other in reserve), each having a nominal apparent power of 1600 kVA and a transformer ratio of 6,3 kV/ 0,4 kV.

**Table 6.26: Key Technical Characteristics of the Hydropower Units**

Number of units	1	3
<b>Hydraulic Turbine</b>		
Turbine type	Kaplan	Kaplan
Nominal water flow, m <sup>3</sup> /s	18	42
Minimal water flow, m <sup>3</sup> /s	5.2	12.9
Height of fall, m	6.5	8.5
<b>Electric Generator</b>		
Nominal active power, kW	963	4,005
Nominal apparent power, kVA	1,070	4,450
Power factor	0.9	0.9
Frequency, Hz	50	50
Nominal voltage, kV	6.3	6.3
Rotation speed, rot/min	166.7	136.4

**Table 6.27: HPP Electricity Production**

Year	Production, MWh
2001	5,970
2002	6,381
2003	12,855
2004	19,573

## 6.6. Ash/Slag Evacuation System

The ash/slag evacuation system is a hydraulic one, using raw water from the Jiu River. The slag from the lignite combustion is collected and cooled in a water pool located at the bottom of the furnace. After crushing, the slag is taken-over by a water ejector (two ejectors for each unit) and transported to four (hydro-mixture) pumping stations, each of them corresponding to two units. Similarly, the flying ash collected in the flue gas path (electrostatic precipitators, air pre-heaters, etc.) is evacuated to the same (hydro-mixture) pumping station by using raw water.

From the pumping station the hydro-mixture is transported to the “Valea Ceplea” storage. Water for ash transport is recycled by using a pump station. At present there are two deposits. Deposit no. 1, in operation, with a capacity of about 25 million m<sup>3</sup> and a surface area around 250 ha. Deposit no. 2 - in



reserve - with a capacity of about 8 million m<sup>3</sup> and a surface area around 70 ha. Each hydro-mixture pumping station is equipped with the pumps.

Erosion causes serious problems. The high erosion leads to high use of pumps components and to frequent repairs. The needed water for the ash/slag evacuation is supplied by two flushing-water pumping stations (one pumping station for 4 units). The pumps are centrifugal type, multi-stage in vertical arrangement.

## **6.7. Water Chemical Treatment**

The chemical treatment of the water is realized in four stations:

### **THE PRE-TREATMENT STATION**

During the pre-treatment the raw water is filtered by using a coagulation method. The pre-treatment is realized by injection of FeCl<sub>3</sub> and Ca(OH)<sub>2</sub> into the raw water. There are three coagulation systems, each with a capacity of 900 m<sup>3</sup>/h. Usually, two of them are in operation and one is kept in reserve. The pre-treated water is used for the demineralization and softening stations and cooling circuit make-up as well as for bearings cooling and sealing circuits

### **THE DEMINERALIZATION STATION**

The demineralization station is equipped with 3 storage tanks (3 x 1000 m<sup>3</sup>). Inside the tanks the water quality is controlled by ammonia injection. The station was commissioned in 1985 in order to cover the increasing Turceni plant consumption of treated water. Starting with 1998 the replacement of filters has started. Up to now 4 filters were replaced (2 cationic and 2 anionic).

### **THE SOFTENING STATION**

The softening station was designed for a maximum output of 200 m<sup>3</sup>/h. There are 3 cationic filters mounted in a tandem units, which are using NaCl as reagent.

### **THE MAIN CONDENSATE CHEMICAL TREATMENT STATION (CONDENSATE POLISHING STATION)**

The condensate polishing station is placed in the steam turbine circuit after the 1<sup>st</sup> stage of the main condensate pumps. It contains 4 lines, each having a cationic filter and a mixed (cationic/anionic) filter. By design the chemical treatment for the entire feed water flow (1035 t/h) can be assured by three of these lines. Each unit has its own condensate polishing station.

## **6.8. Power Evacuation Facilities**

TPP Turceni is provided with a 400 kV electric station (outdoor type), which is assuring the interface with to the National Power System (NPS) – Electricity Transmission Grid (ETG). The energy produced by the Turceni Power Plant is delivered to the National Grid through four double – circuit 400 kV Overhead Power Lines (owned by Transelectrica – The National Electricity Transport Company), two units per each line. These lines make the connection with the 400 kV Tantareni electric station located 9 km far from Turceni Power Plant.

Switches represent the main equipment of the Turceni 400 kV electric station. From the commissioning, units Nos. 1 and 6 are using oil switches (IO 420 kV type manufactured by Electroputere Craiova). There was no report of serious functioning problems. For units Nos. 3, 4 and 7 the IO 420 switches were replaced by SF<sub>6</sub> type switches (manufactured by ABB) during year 2001.



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At present there is a temporary situation for the Units no. 5.6 and 7 that are linked at the same 400 kV Power Line, due to the undergoing rehabilitation activities that are carried out in the power plant – Unit no. 5 – and in the Tantareni Substation, too.

Turceni TPP has also a 110 kV electric station (outdoor type with H connection), which is linked to the Sardanesti 110 kV electric station through 6 lines. The energy supply for the units ancillaries when these Units are not in operation as well as for some the others power plant auxiliaries is made through this station. The switches installed on the 110 kV lines are also oil type (IO 123 kV – manufactured by Electroputere Craiova).



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## **7.0. MINING PART OF TURCENI ENERGY COMPLEX**

### **7.1. Open Cast Mining – Jilt - Technical and Technological Aspects**

#### **BRIEF HISTORY OF THE LIGNITE EXPLOITATION IN THE JILT COAL BASIN**

Lignite mining activity in the Jilt coal basin started in 1977 with the opening of the Matasari mine. In 1978, works were started for the opening of the Jilt Sud open pit. During 1980-1990, another three mines: Dragotesti, Cojmanesti, Tehomir were opened. At the same time, the opening of the second open pit – Jilt Nord was completed. At present the Matasari, Dragotesti and Cojmanesti mines are shut down, environment rehabilitation operations being carried out here.

#### **GENERAL CONDITIONS**

##### **Description of Sites**

Jilt and Dragotesti/Tehomir coalmines are located in the Southern part of Romania, 300 km West from Bucharest, in the Western part of Gorj County. Jilt and Dragotesti coal mines are located in the Motru-Jilt-Rovinari Coal Basin, within the administrative territories of Slivilesti, Dragotesti, and Matasari villages. Lignite deposits are in the North-Western part of the great hydro-geological basin quartered on Dacian and Romanian deposits in Oltenia, with significant static and dynamic water reserves. The exploration of the area revealed the presence of ground water at shallow depths, of 2-3 m, in the Sub-Carpathian depressions and in the alluvial plains of the piedmont area. Ground waters are located 20 m deep on interfluves and 7 -8 m deep on terraces. The drainage is poor and the river runs dry during the drought periods of the year, as the ground water level is lower than the main river bed.

#### **DESCRIPTION OF THE AREA**

##### **Topography**

The maximum elevations in the perimeter of Jilt Sud are: Malului Hill (350m); Jgheabul Hill (330m); Arsitei Hill (374m), Croici Hill (318m). There are depressions in the Jilt, Malului, Runcurel and Croici Valleys. All secondary valleys opening out towards the Jilt valley are generally oriented from West to East. The maximum elevations in the perimeter of Jilt Nord: Runcurelu Hill (390m); Bradet Hill (395m); Cerchez Hill (353m). There are depressions in the Jilt, Runcurel, Larga and Bradetel Valleys.

##### **The Existing Land Structure of the Area**

At present the Jilt Sud perimeter has the following usage: pastures 525.9 hectares, forests 237.4 hectares, arable land 160.7 hectares, meadows 73.6 hectares, orchards 12 hectares, vineyards 5 hectares, other uses 10.4 hectares. The Jilt Nord perimeter has the following usage: pastures 82.72 hectares, forests 218.3 hectares, arable land 6.9 hectares, meadows 1 hectare, orchards 12 hectares, vineyards 0.5 hectares, other uses 0.5 hectares.



**Fig.7.1: Map of Gorj County**



### Mining Area:

Since the opening of the pits, the method used for obtaining the necessary area was land expropriation as shown in all documents (decrees, orders, decisions) owned by EMC Jilt. For all these lands expropriated before 1989, EMC Jilt drew up the reference material and obtained the Ownership Certificate, thus they became owners of the mining area.. After 1989, lands were purchased through negotiation with the landowners, private agreements were filled and booked in the land register. According to the law in force (Environment Law, law 19/1991, law 169/1997), holders of the investment and operating works are obliged to take all due measures for the restoration of the affected area t within 2 years since the area has been freed from technological tasks. During 1999-2003, 146.03 hectares were re-cultivated: 59.76 hectares for arable land and 86.27 hectares for forests. Feasibility studies and development plans drawn up for the Jilt Sud and Jilt Nord open pits present an inventory of the area to be taken over, during different periods of time, for which the mining license was requested.

Total area of 1,035 ha is planned to be taken over by 2020 for the Jilt Sud open pit and for the external dump Bohrelu. For the execution of mining works, 96 private farms, from which 37 in Croici village, 10 in Stiucani village, 17 in Valea Jgheabului village, 49 in Bohorelu village, a school, a church and a cemetery in addition to listed farms, will be moved from their location. Buildings in Bohorelu and Valea Jgheabului had an expropriation order issued before 1989, but the farms have never been completely demolished. At present, they are being rebuilt on new locations as agreed during negotiations with the landowners. The church was rebuilt in Cornesti village. The private farms from Stiucani village will be moved during 2005-2008 and those from Croici village will be moved later, during 2010-2018. Total area of 322 ha is to be expropriated until 2019 for the Jilt Nord open pit and the external dump Bohrelu.. The mining license does not authorize any construction in this area.

### DESCRIPTION OF COAL DEPOSITS:

#### Geology Aspects:

There are abundant lignite deposits that may be mined in open pits.



The geological profiles through the Jilt Nord and Jilt Sud perimeters are described in figures 7.2 and 7.3.

### Resources

**Resources volume:** On the 1<sup>st</sup> of January 2001, industrial resources were defined by the decisions: 77-01/2001 (for Jilt Nord) and 78-01/2001 (for Jilt Sud), both issued by National Agency for Mineral Resources, 42,596 thousand tones in Jilt Nord, 63,274 thousand tones in Jilt Sud, respectively.

For the output planned for the year 2004, these resources would be sufficient for 19 years of operations of the Jilt Nord open pit and for 20 years for the Jilt Sud open pit. Seven new beds were found in the mining area of Jilt, according to the geological investigations.

Coal deposits existing on the 1<sup>st</sup> of January 2004 in the Jilt Nord open pit are estimated at 37 million tones and the volume of sterile cover to be dug is estimated at 163 million m<sup>3</sup>, according to the geological investigations.

**Table 7.1: Coal Beds Characteristics – JILT NORD Perimeter**

Minable Beds	V	VI	VII	VIII	IX	X	XII	TOTAL
Bed Thickness (m)	2.6	3.51	2.7	3.3	2.53	9.28	1.68	25.6
Ash (%)	37.8	36.9	36.2	37.5	43.9	37.9	43.6	38.5
Humidity (%)	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5
Heat Content (Kcal/kg)	1,766	1,800	1,829	1,777	1,519	1,726	1,532	1,737
Industrial Resources (thousands of tones)	2,616	4,680	4,492	5,039	4,138.5	14,456	1,585.5	37,007

Layers V, VI and VII have not been opened yet in the Jilt Nord open pit so the open pit floor has not been yet freed for internal dumping.. Coal deposits existing on the 1st of January 2004 in the Jilt Sud open pit are estimated at 56.3 million tones and the volume of sterile cover to be dug is of 308.6 million m<sup>3</sup>, according to the geological investigations.

**Table 7.2: Coal Beds Characteristics – JILT SUD Perimeter**

Minable Beds	V	VI	VII	VIII	IX	X	XII	TOTAL
Bed Thickness [m]	3.54	2.36	2.32	1.4	8.06	1.4	2.84	21.9
Ash%	35.3	35.4	37.7	41.2	36.9	39.6	41.2	37.8
Humidity[%]	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5
Heat Content [kcal/kg]	1,824	1,821	1,725	1,691	1,759	1,651	1,591	1,725



Figure 7.2: Geological Profile of Jilt Nord Quarry

PROFIL GEOLOGIC PERIMETRUL JILT NORD

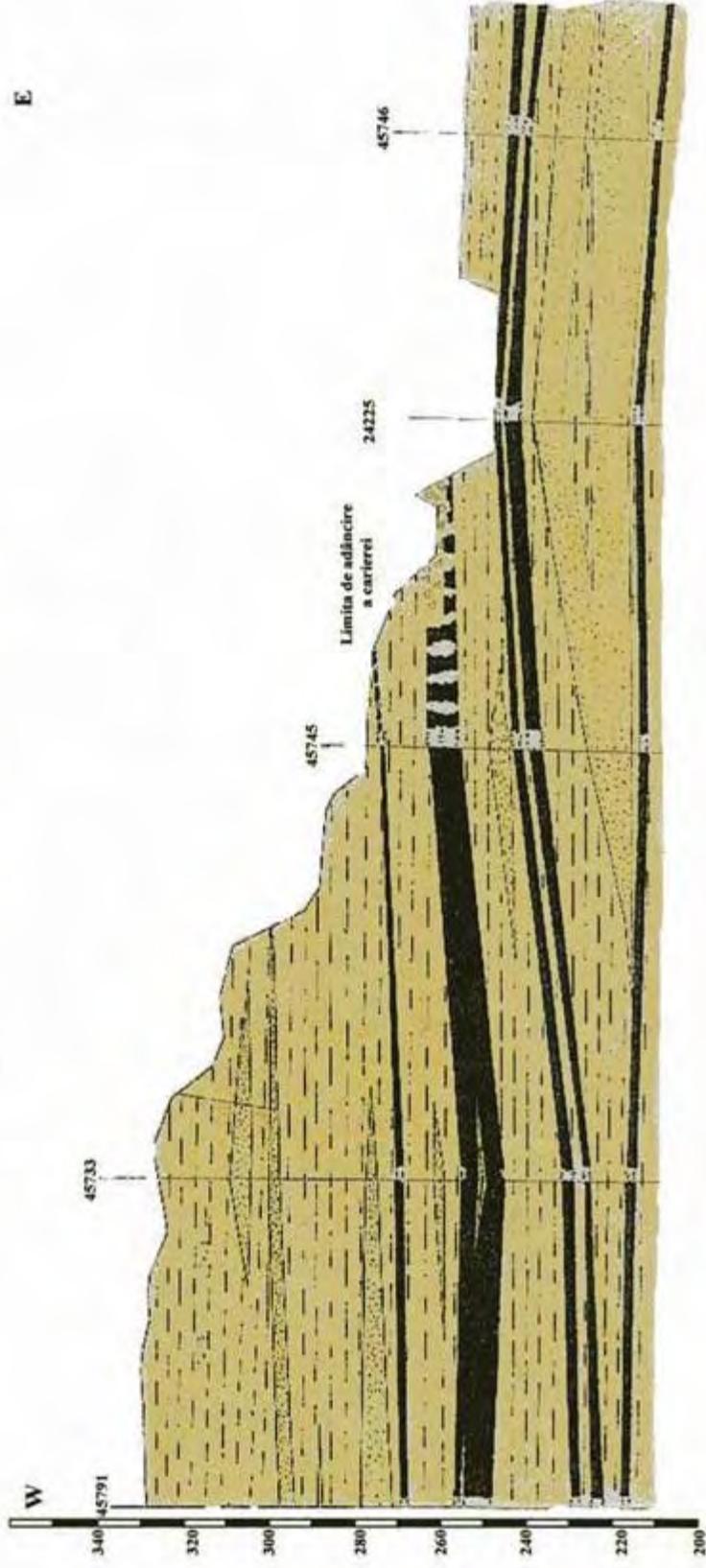
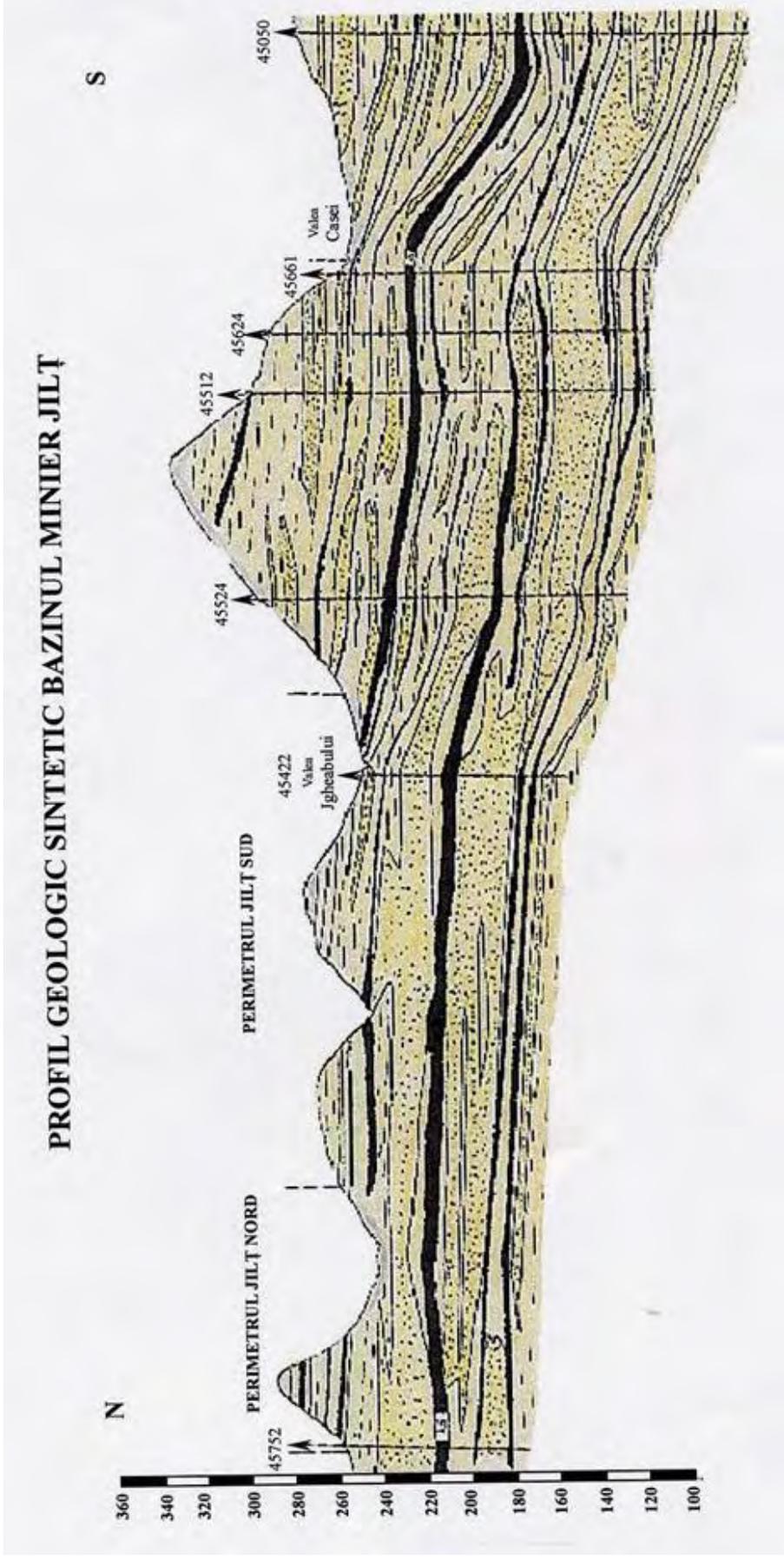




Figure 7.3: Geological Profile of Jilt Sud and Jilt Nord Quarries





In the Eastern part of the Jilt Sud open pit, layer X is not mined on 50% of its length, because it is blocked by forests and all the land clearing works are being delayed. Layer XII will be quarried out on several areas where its thickness is over 1 m. There is a particular situation in the Jilt Sud open pit, where the mining level of layer X and the emptying levels beneath it, are placed 600 m ahead of the other working levels. This is making difficult the advance of the internal dump.

**Quality of the Coal:** The lignite from the Jilt perimeter is a brown coloured coal, rarely blackish, with irregular shapes. When coming into contact with the air, the lignite dries. In 1971, the laboratory tests showed the wide variation of the qualitative lignite characteristics.

**Table 7.3: Qualitative Lignite Characteristics**

Characteristic	Jilt Sud	Jilt Nord
Ash-to-dry coal ratio	22,36-40,20 %;	13,90- 51,10
Total humidity	27,27-50,77 %;	16,70 – 51,40
Volatiles to-flammable mass ratio	54,70-60,70 %	18,70- 45,40
Carbon-to-flammable mass ratio	31,57 –42,06%;	10,90 – 54,30

In 1981, the laboratory tests of the sulphur-flammable source ratio showed a value of 2.43-2.67% in the Jilt Sud perimeter and of 0.91-1.81% in the Jilt Nord perimeter. The norm STAS 5270-73 stipulates an average reference value of 1.5%.

**Table 7.4: Average Power Heat of the Output Obtained During the Last 5 Years (in Kcal/kg)**

Year	Jilt Sud	Jilt Nord
1999	1,647	1,543
2000	1,643	1,620
2001	1,729	1,676
2002	1,724	1,676
2003	1,766	1,732

**Resources in the Future:** During 2004, 121.3 million tones of resources for the Jilt Nord open pit were homologated on a basis of the resolution 43-81/1981 of the Council of Ministers and 164.5 million tones of resources for the Jilt Sud open pit, on a basis of the resolution 180-63/1984 of the Council of Ministers. Relative to the production volume estimated for the year 2004, these resources would be sufficient to secure operation for 63 years for the Jilt Nord open pit and 60 years for the Jilt Sud open pit. Potential deposits in the Jilt coal basin are calculated in the “Geological documentation for the evaluation of the resources potential in the Jilt Nord mining field”, where another 58.5 million tones would be available.



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## USED MINING TECHNIQUES

### Open Pits Techniques

**Jilt Sud open pit:** The mining technology is based on the use of heavy equipments in a continuous flow:

- mining mass is dug and loaded using excavators with rotor type SchRs 1400
- transport, using belt conveyers, 1400, 1600, 1800 and 2000 mm wide
- sterile deposit is dumped in external (internal) dump BOHORELU, using dumpers type A2Rs 6500, with an arm of 60 and 90m
- direct deposition of the sterile load on penultimate level, using a reloading equipment type MH 4400m<sup>3</sup>/hour, with a throwing arm of 170 m length
- coal loading in/from the deposit, whose capacity is of 180 000 tones, using a combined equipment type KsS 5600/3800.40 and AsG 12500.

The approved mining project provided for the use of 13 excavators with rotor, 9 of them type 1400 and 4 type 470. CNLO have managed to purchase 8 excavators type 1400, numbered with E-01, E-02, E-03, E-04, E-05, E-12, E-13, E-15, which are still in service.

The description of the technological flow: mining-transport-dumping

**Level I (altitude +315):** The excavator E-02 digs sterile load, which is carried by 5 conveyer belts for a distance of 2.8 km to the junction of distribution (at an altitude of +238).. From here, it is moved by conveyers to the external dump Bohorelu, located at 5 km distance from the mine, where dumpers A-03 and A-06 are used (at altitudes of +305 and +285).

**Level II (altitude +293):** The excavator E-15 digs sterile load, which is carried by two conveyer belts to the external dump Stiucani, at 1.5 km distance, where the dumper MHD is used (at an altitude of +280..

**Level III (altitude +277):** The excavator E-05 digs sterile load and coal (from layer XII), which are carried by 4 conveyer belts for a distance of 3 km to the junction of distribution.

**Level IV (altitude +255):** The excavator E-01 digs sterile load and coal (from layer X), which are carried by 5 conveyer belts for a distance of 3 km to the junction of distribution..

**Level V (altitude +245):** The excavators E-03 and E-04 digs sterile load and coal (from layer VIII) which is carried on different belts for a distance of 2.8 km to the junction of distribution.. The sterile load that is dug by E-04 is transported to the external dump Bohorelu and from here it is transported for a distance of 1.8 km by E-03 to the internal dump, where dumpers A-04 and A-08 are working (at altitudes of +250 and +265).

**Level VI (altitude +235):** The excavator E-13 digs sterile load, which is deposited in the internal dump using the dumper A-07 equipped with a throwing belt of 170 m long..

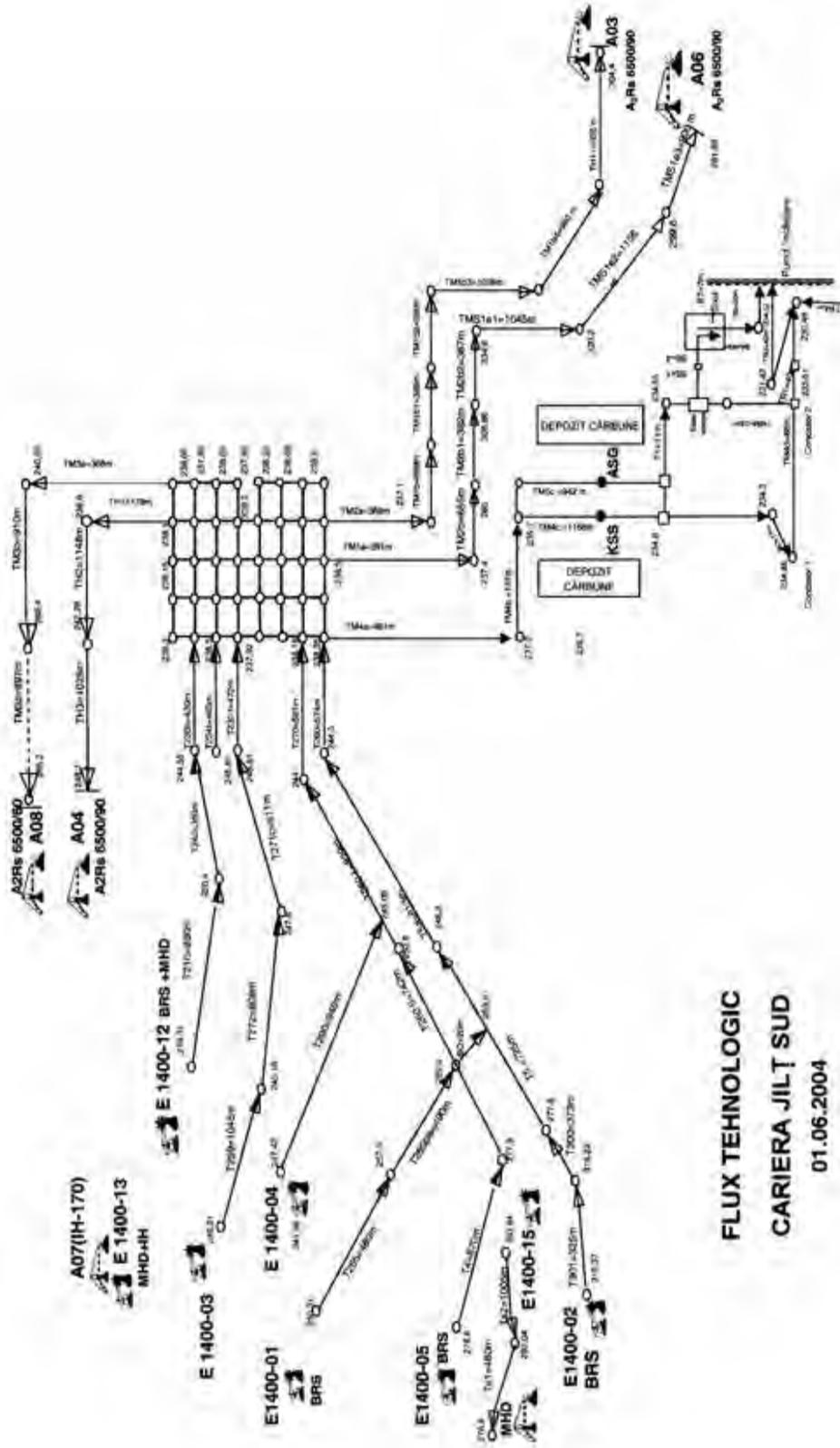
**Level VII (altitude +220):** The excavator E-12 digs sterile load and coal (from layer VII and VI), which is carried by 3 conveyer belts for a distance of 1.6 km to the junction of distribution.. From here, the sterile load is moved on one of the carrier lines in the internal dump, to the dumpers A-04 and A-08.

**Jilt Nord open pit:** Extraction technology is based on the use of heavy equipments in a continuous flow:

- Mining mass is dug and loaded using excavators with rotor type SchRs 1400 and SRs 470;
- Transport of coal is using belt conveyers, 1400, 1600 and 1800 mm wide.



Figure 7.5: Technological Flow Jilt Sud Open Pit, Year 2004





- Sterile load moved to external /(internal) dump, using for it dumpers type A2Rs 6500, with an arm of 90 m
- Coal is deposited/removed in/from the deposit, using an equipment type KSs 5600/3800.40.

The approved mining project stipulated use of 10 excavators with rotor, 6 of them type 1400 and 4 type 470. Jilt open pit mining management purchased 9 excavators out of which 5 type 1400 and 4 type 470.

Turceni Energy Complex intends to purchase additional 2 excavators type 1400, one from St.. Gheorghe (Covasna) open pit and the other from Bustuchin open pit and plans to give up on 3 excavators type 470. First of all, the depth of the open pit is planned at 35-40 m for the opening and setting into operation of lignite layers V, VI and VII.

Once the opening of the mining level (layer V) takes place, the carving height reaches 165 m. Working with 7 excavators type 1400, the mining level will reach an average height of 24 m. The sterile load is deposited in the external dump Valea Bohorelu, using for it twodumpers, the third one being used for depositing sterile load into the internal dump of the neighbouring open pit Jilt Sud.

A junction of distribution is built in the Northern part, leading the sterile load to dumps and the coal to its storage place or to the wagon loading point. Coal is deposited in twopiles, having a total volume of 150 thousand tones with use of a combined equipment type KsS 5600/3800.

#### The description of the technological flow: mining- transport-dumping

**Level I ( altitude +330):** The excavator E-14 digs sterile load, which is carried for a distance of 1.7 km by three conveyer belts to the junction of distribution (at an altitude of +263).. From here, it is moved by a conveyor to the external dump Bohorelu, located 6.6 km apart, where the dumper A-02 is employed (at altitudes of +350).

**Level II ( altitude +300):** The excavator E-06 digs sterile load, which is carried for a distance o 1.5 km by three conveyer belts to the junction of distribution.. From here, it is moved via conveyor to the external dump Bohorelu, located t at 6.6 km distance, where the dumper A-02 is used (at altitudes of +350).

**Level III ( altitude +277):** The excavator E-17 digs sterile load and coal (from layer XII), which is carried by four conveyer belts for a distance of 1.4 km to the junction of distribution.. From here, it is moved by conveyor to the external dump Bohorelu, located at 6.6 km distance from the dump. At Bohrelu dumper A-03 is used (at altitudes of +310) or sterile load is moved to the internal dump Jilt Sud, for at 4.3 km distance, where the dumper A-05 is used.

**Level IV ( altitude +262):** The excavators E-10 and E-16 type 470 digs sterile load and coal (from layer X), which are carried by 4 conveyer belts for a distance of 2 km to the junction of distribution having the same belt as the excavator from the level III.

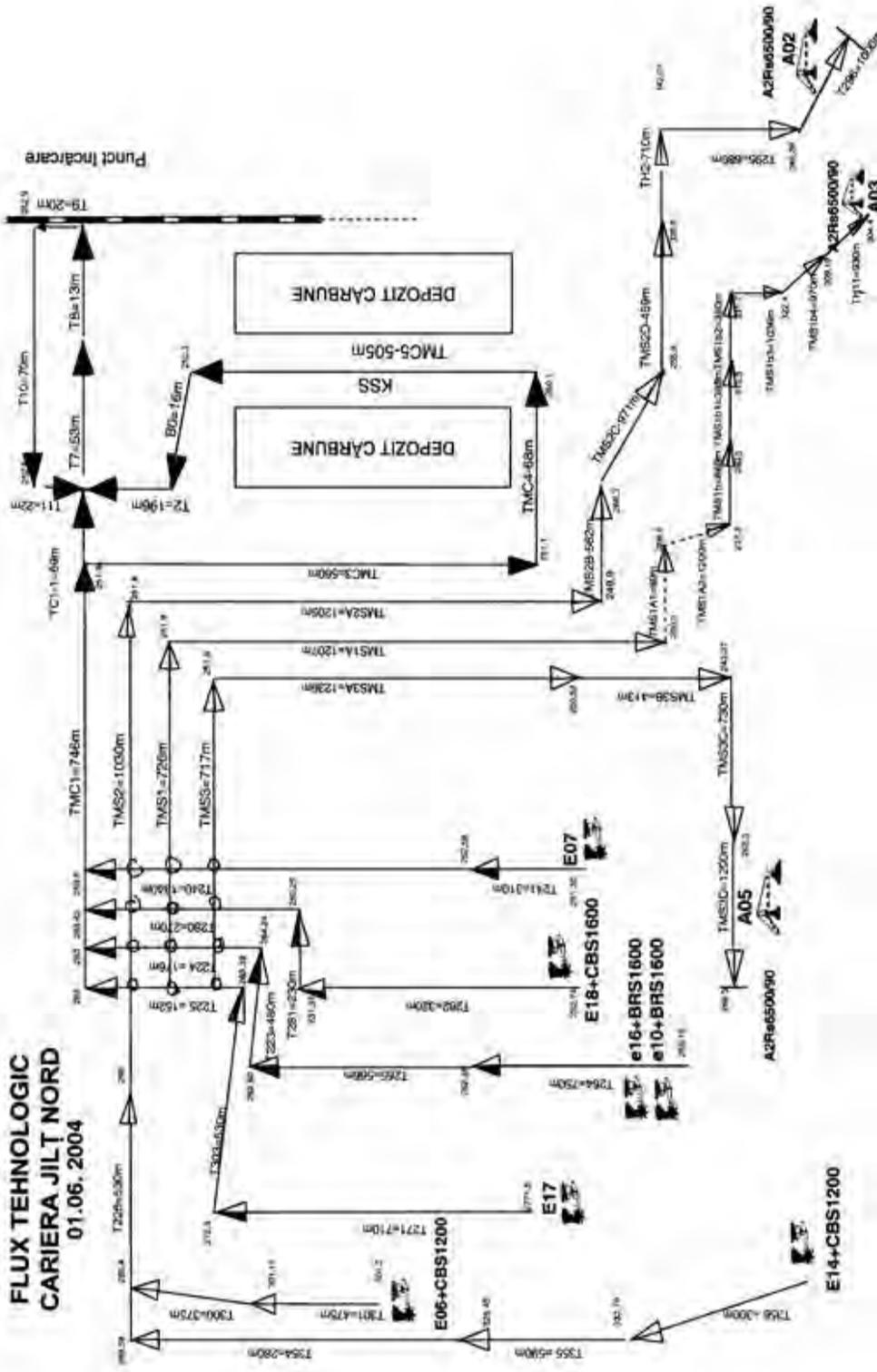
**Level V ( altitude +250):** The excavator E-07 digs sterile load, which is deposited in the internal dump using the dumper A-05.

**Level VI ( altitude +232):** The excavator E-18 digs sterile load and coal (from layer VIII), which are carried by three conveyer belts for a distance of 1 km to the junction of distribution., having the same belt as the excavator from the level III.

**Level VII (altitude +220) and level VIII (circulation? altitude +200) are not used:** The technological transportation flow diagram on the 1<sup>st</sup> of June 2004 is shown in Figure 7.6.



Fig 7.6: Technological Flow Jilt Nord Open Pit, Year 2004





### Wastes

One part of the sterile load r from the emptying of the Jilt Nord and Jilt Sud open pits is transported to the external dump Bohrelu, the other part to the Jilt Sud and Jilt Nord internal dumps. During 1990-1993 a volume of 17 million m<sup>3</sup> sterile load from Jilt Sud was dumped in the Valea Stiucani external dump. Starting with 2003, the emptying activity in Valea Stiucani was resumed, but in a different area of the Valea.

**Table 7.5: Accumulation of the Sterile Load (000s m3)**

	Waste Accumulated Prior To 2003 (thousands m <sup>3</sup> )	Estimated Waste Accumulation During 2004-2018	Waste Accumulated in the External Dump	Waste Accumulated in the Internal Dump
Jilt Sud	293 566,5	361 062	108 362	252 700
Jilt Nord	104 196,1	203 823,9	99 182	104 641
TOTAL	397 762,6	564 885,9	207 544	357 341

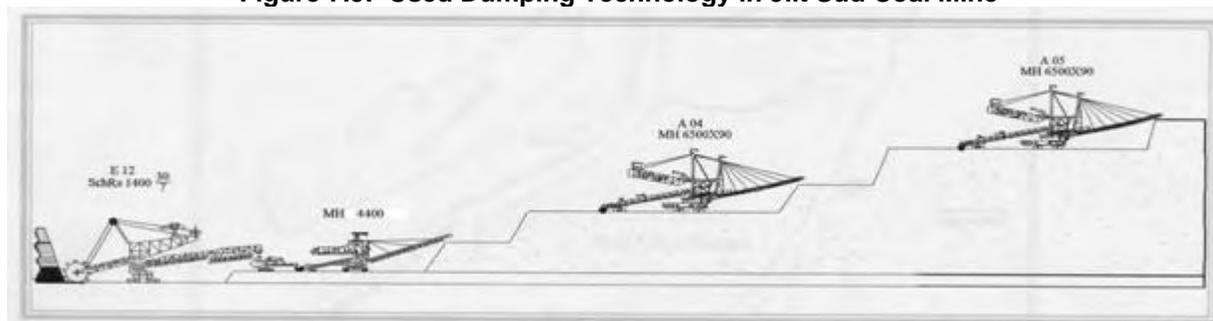
**The external dump Bohrelu** is located in the Eastern side of Jilt coal basin, in Valea Bohorelu, over Matasari mine. It covers an area of 845 hectares. A total volume of 360 million m<sup>3</sup> will be deposited and its top will be at 90 m. height. Bohorelu dump has five sediment levels, here are working threedumpers, two of them are depositing the sterile load from the Jilt Sud open pit and the third is depositing the sterile load from the Jilt Nord open pit. The rate of advance for the first level of the Bohorelu dump depends on a pace for land expropriation of private farms in Bohorelu village. In the absence of the status of a public utility provided by the Law 33/1994 negotiations with the community were slowed down.

As a forest clearing on the flanks was not done, so the levelling of the land to its natural elevation was not made. Many lakes were created, affecting the stability of the dumps and the natural walls. In 2003, a support wall at the dump Bohorelu was built for o the sterile load deposited in a neighbouring Pinoasa open pit. It was leading to deterioration of the ground drain built for the Bohorelu dump and to creation of a lake at the bottom of the Bohorelu dump. A map of the Bohorelu external dump location is presented in Figure 7.7:

**The internal dump of the Jilt Sud open pit** is in the free area in the Northern part of the Jilt Sud perimeter. Presently, 3 dumpers work there. The internal dump will be expanded horizontally and vertically, according to the rate of extraction advance at the 7<sup>th</sup> mining level.

The internal dumping technology employed in Jilt Sud open pit is described in Figure 7.9.

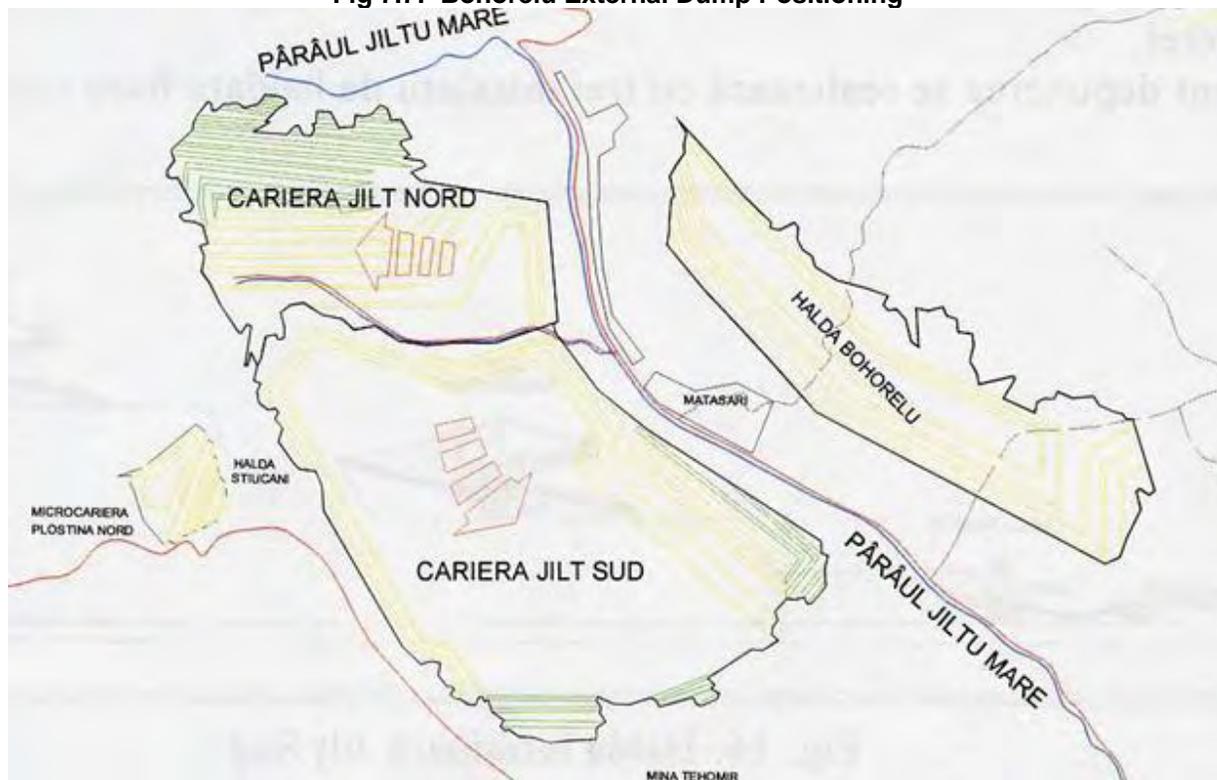
**Figure 7.9: Used Dumping Technology in Jilt Sud Coal Mine**





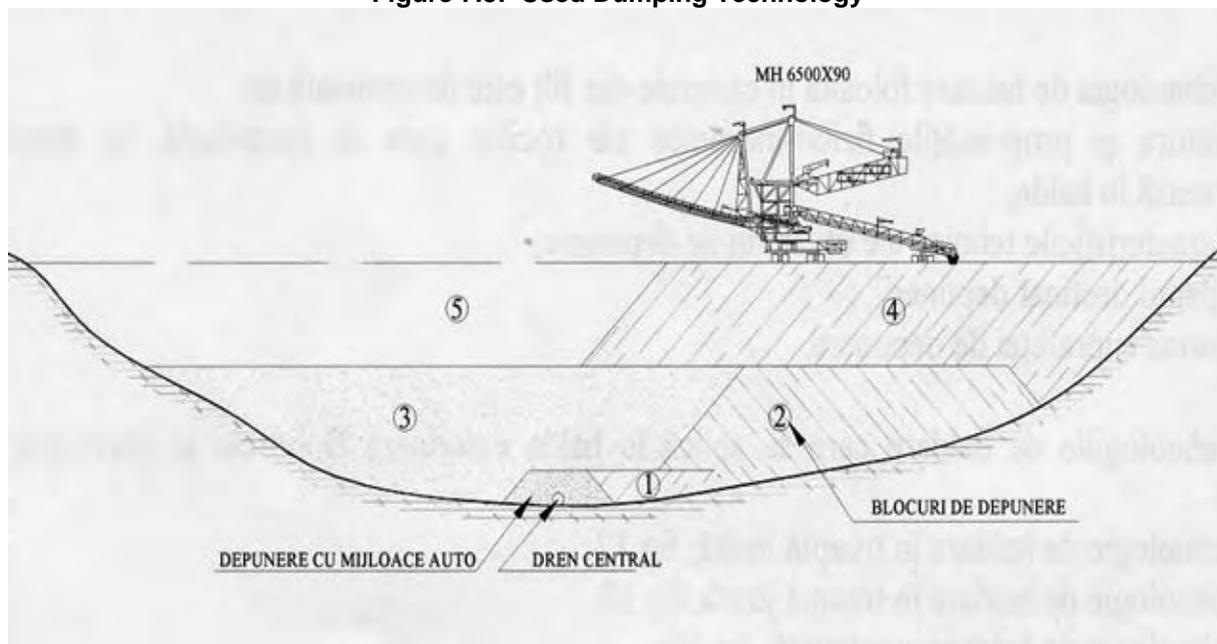
The internal dump of the Jilt Nord open pit is in the free area of the Eastern part of the Jilt Sud perimeter. The internal dump will be expanded horizontally and vertically according to the reduction pace of layer V of the open pit.

**Fig 7.7: Bohorelu External Dump Positioning**



The dumping technology used is described in figure 7.8.

**Figure 7.8: Used Dumping Technology**





## Open Pits Output:

### *Projected Output*

The initial output data , were based on the estimated output of 12.5 million tones /year, out of which 8 million tones/year for the Jilt Sud open pit and 4.5 million tones/year for the Jilt Nord open pit, with a working time of seven days/week. For it 23 excavators have to be used, 15 excavators type 1400 and 8 excavators type 470. According to feasibility studies approved by ANRM, for a 20 years mining license, the estimated output was reduced to sixmillion tones /year, out of which 3.5 million tones /year for the Jilt Sud open pit and 2.5 million tones/year for the Jilt Nord open pit, with a working time of 5 days /week.

### *Actual Output*

The purchase of 18 excavators, 13 of type 1400 and 5 of type 470 permitted to reach 80% of the estimated output. Lately two excavators type 470 were scrapped. During 1978-2003, 338 630 thousand m<sup>3</sup>+tones of mining mass, out of which 293,566.5 thousand m<sup>3</sup> of sterile load and 45,063.5 thousand tones of coal, were dug in the Jilt Sud open pit. During 1984-2003, 118,078 thousand m<sup>3</sup>+tones of mining mass, out of which 104 196.1 thousand m<sup>3</sup> of sterile load and 13,883.1 thousand tones of coal, were dug in the Jilt Nord open pit.

Mining volumes during 1999-2003, in the 2 open pits are presented in tables 7.6, 7.7, and 7.8.

Figures 7.5 and 7.6 show the existing technological flow diagrams on the 1<sup>st</sup> of June 2004, in the Jilt Sud and Nord open pits.

**Table 7.6: Coal Output in 1999-2003 Thousand Tons**

<b>Cariera</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>total</b>
<b>Jilt Sud</b>	<b>2000</b>	<b>2200</b>	<b>2271</b>	<b>2240</b>	<b>2450</b>	<b>11161</b>
<b>Jilt Nord</b>	<b>1000</b>	<b>1250</b>	<b>1799</b>	<b>1585</b>	<b>2205</b>	<b>7839</b>
<b>total</b>	<b>3000</b>	<b>3450</b>	<b>4070</b>	<b>3825</b>	<b>4655</b>	<b>19000</b>

**Table 7.7 – Volume of Sterile Load in 1999-2003 Thousand Tons**

<b>Mine</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>total</b>
<b>Jilt Sud</b>	<b>11512</b>	<b>12700</b>	<b>17109</b>	<b>20696</b>	<b>22730</b>	<b>84747</b>
<b>Jilt Nord</b>	<b>7518</b>	<b>8966</b>	<b>11057</b>	<b>12815</b>	<b>13595</b>	<b>53951</b>
<b>total</b>	<b>19030</b>	<b>21666</b>	<b>28166</b>	<b>33511</b>	<b>36325</b>	<b>138698</b>

**Table 7.8 – Volume of Mining Mass Dug in 1999-2003 Thousand Tons**

<b>Mine</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>Total</b>
<b>Jilt Sud</b>	<b>13512</b>	<b>14900</b>	<b>19380</b>	<b>22936</b>	<b>25180</b>	<b>95908</b>
<b>Jilt Nord</b>	<b>8518</b>	<b>10216</b>	<b>12856</b>	<b>14400</b>	<b>15800</b>	<b>61790</b>
<b>Total</b>	<b>22030</b>	<b>25116</b>	<b>32236</b>	<b>37336</b>	<b>40980</b>	<b>157698</b>



## MINING PLANNING:

### Estimation for the Year 2004:

For the year 2004 has been planned an output of 5 million tones of coal, having a heat content of 1740 kcal/kg and a stripping volume of 38,765 thousand m<sup>3</sup> of sterile load, having a stripping ratio of 7.76 m<sup>3</sup>/tones.. Relative to the year 2003, the increased productivity was obtained thanks to use of excavator E-18, which was put into service in September 2003.

**Table 7.9: Volume of Mining Mass During 2004**

Open pit	Mining mass 000s of (m <sup>3</sup> +to)	Sterile 000s (m <sup>3</sup> )	Coal 000s (to)	Working time (hours)	Nº of excavators
JILT SUD	26 983	24 023	2 900	25 753	8
JILT NORD	16 842	14 742	2 100	20 371	5+3
TOTAL 2004	43 765	38 765	5 000	46 124	13+3
Actual 2003	40 980	36 325	4 665	46 803	13+3

### Mining Planning During the License Validity Period:

#### *Jilt Sud Open Pit*

The feasibility study presents the mining plan until 2018. The volume extracted is calculated taking into account the activity on sectors and is presented in the Table 7.10. During 2004-2018, a volume of 371 874 thousand m<sup>3</sup>+tones will be dug out, of which 308 600 m<sup>3</sup> of sterile load and 56 334 tones of coal, with a stripping ratio of 5.49 m<sup>3</sup>/tones.

**Table 7.10: Volumes of Sterile Load to be Deposited During 2004-2018 at Jilt Sud Mine**

Activity Sector	Period (years)	Mining mass 000s m3	Sterile 000s m3	Powder Sterile 000s m3	Internal Deposit 000s m3	External Deposit 000s m3	Total Deposit 000s m3
S2	2004-2008	121460	102860	120346	40000	80346	120346
S3	2009-2013	121460	102860	120346	92330	28016	120346
S4	2014-2018	121980	102880	120370	120370	0	120370
TOTAL 2004-2018		364900	308600	361062	252700	108362	361062

*Source: ICSITPML Craiova – Feasibility Study for Jilt Sud Mine – technical documentation for granting mining license to CNLO – No 707-493 - 1999*

**Table 7.11: Projected Utilization Key Data for Excavator – Jilt Sud Mine**

Activity Sector	Period (years)	Mining Mass 000s m <sup>3</sup>	Sterile 000s m <sup>3</sup>	Coal (thousand tons)	Operation working hours (hours/year)	Extensive ? index (le) (%)	Productivity (cm <sup>3</sup> /h)
S2	2004-2008	24327	20573	3753	2963	0.338	1026
S3	2009-2013	24327	20573	3753	2963	0.338	1026
S4	2014-2018	24327	20573	3753	2963	0.338	1026

Source: ICSITPML Craiova – Feasibility Study for Jilt Sud Quarry – technical documentation for granting mining license to CNLO – No 707-493 – 1999.

### ***Jilt Nord Open Pit***

The feasibility study presents the mining plan until 2018. The volume extracted is calculated taking into account the activity on sectors and is presented in Table 7.11. During 2004-2018, a volume of 200,007 thousand m<sup>3</sup>+tones will be dug, out, of which 163 059 m<sup>3</sup> of sterile load and 37 007 tones of coal, with a stripping ratio of 4.41 m<sup>3</sup>/tones.

**Table 7.12: Volumes of Sterile Load to be Deposited During 2004-2018 at Jilt Nord Mine**

Activity Sector	Period (years)	Mining mass 000s m <sup>3</sup>	Sterile 000s m <sup>3</sup>	Powder Sterile 000s m <sup>3</sup>	Internal Deposit 000s m <sup>3</sup>	External Deposit 000s m <sup>3</sup>	Total Deposit 000s m <sup>3</sup>
S2	2004-2008	66913	54353	67941.3	12500	55441	67941
S3	2009-2013	66913	54353	67941.3	24200	43741	67941
S4	2014-2018	66181	54353	67941.3	67941	0	67941
TOTAL 2004-2018		200007	163059	203823.9	104641	99182	203823

Source: ICSITPML Craiova – Feasibility Study for Jilt Nord Quarry – technical documentation for granting mining license to CNLO – 710-250 – 1999.

## **TECHNOLOGICAL EQUIPMENTS AND MACHINERY**

### **Technological Equipments and Machinery in the Open Pits**

Equipments used in work, during 2004:

- 13 excavators Etc 1400-30/7;
- 3 excavators Erc 470-15/3.5;
- 113 belt conveyers, 61.6 km total length;
- 8 deposit equipments, 3 in the external dump Bohorelu and 5 in the internal dump.



### *Existing Dispatching System - Measurement Aspects*

#### **Intercommunication system at EMC Jilt**

Inter-communication system is using the following equipments:

- communication station, type SCSEA-01 – 33 stations
- mobile MOTOROLA stations – 126 stations
- GM 300 MOTOROLA stations – 42 stations
- SPECTRA F MOTOROLA stations – 11 stations
- DGT 9000 (SPECTRA 6) MOTOROLA stations – 12 stations.

**Table 7.13: List Containing Main Equipments in the Open Pit**

Equipment	Jilt Sud	Jilt Nord	ECFU?	Total EMC JILT
Excavator with rotor Of which:	8	8	-	16
Excavators Erc-1400	8	5	-	13
Excavators Erc-470	-	3	-	3
Deposit equipments From which:	6	2	-	8
MHD 4400 . 50	1	-	-	1
Deposit equipment 6500 . 60	1	-	-	1
Deposit equipment 6500 . 90	3	2	-	5
Deposit equipment 4400 . 170	1	-	-	1
Linking equipment, from which:	6	5	-	11
MHD 4400 . 50	2	-	-	2
BRS 1600 . 60	4	2	-	6
CBS 1200 29/31	-	3	-	3
Coal deposit equipment	2	1	-	3
KSS 5600 . 40	1	1	-	2
ASG 12500	1	-	-	1
Belt carriers, from which:	64/34,9km	36/28,1km	-	100/63km
Belt conveyers B=1400mm	23 piece/16,46 km	15/6,7 km	-	38/23,1km
Idem B=1600 mm	7/1,6 km	6/1,9 km	-	13/3,6km
Idem B=1800 mm	30/15,5 km	15/19,5 km	-	45/34,9km
Idem B=2000 mm	4/1,4 km	-	-	4/1,4km
Engines Locomotives			9	9
Railway tracks			23km	23km



Equipment	Jilt Sud	Jilt Nord	ECFU?	Total EMC JILT
Switching lines (crossings)			20	20

### Output dispatching system at EMC Jilt.

The system in operation provides information about status of 8 excavators, 72 belt carriers and 2 dumpers. There is a possibility to have for the Jilt Nord and Jilt Sud additional data needed for:

- Operational management of the production; and
- Information regarding: the work time of the excavators, their down time and its causes, extracted volume, output loaded in wagons and forwarded.

### Power dispatching system at EMC Jilt

Since 2000, the administrative system of the electric power operates within the transformer station 110/20 KV – Bradet, being improved in 2002. The monitored parameters are: active power, active and reactive energy.

The telecommunication management system of the electric power supplies the following information:

- Reports following the load curve of the active energy received for intervals of 15, 30, 60, 120 minutes a day;
- Daily, monthly and annual accounts of the energy reports with the index of each meter
- Reports containing the tariff for predefined systems (A, B, C, D, E). This system can calculate the invoice amount for each tariff, performing at the same time a comparison (distribution of costs) between tariff systems;
- Reports following the average power during rush hours and of the rush hours, costs, specific consumption per unit, warnings regarding the defaults and the errors of the system.

There is no comprehensive energy control performed until now, so data on the energy consumption by technological lines or by equipments are not available.

### Measurement Aspects

The belt carrier T7 in the Jilt Nord open pit is equipped with a belt balance type CB-100, made by AUTOMATICA Bucharest, which measures the flow of mining mass. The belt carrier T4B in the Jilt Sud open pit is equipped with a belt balance produced by ICMET Craiova and the excavator E-01 with a belt balance produced by IPA CIFAT Craiova, however both balances are non-working. The excavator E-12 is equipped with a balance made by AUTOMATICA.

**Electric Power Supply System:** The electric power is provided by Jilt station 110/20 kV, equipped with 3 transformers 110/20 kV, having a power of 40 MVA. Transformer stations 20/6 kV are linked to it through AEL 20 kV, loading the belt carriers and the technological equipments. There are 14 stations 20/6 kV in the Jilt Sud open pit. Another 2 stations will be built before 2006 and two others will be upgraded. There are 7 stations 20/6 kV in the Jilt Nord open pit.

**Table 7.14: Centralizing of the Electric Power Consumption**

Year	Active Consumption of Electric Power (kwh)
2000	14,1325



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Year	Active Consumption of Electric Power (kwh)
2001	179,111
2002	170,624
2003	176,616
2004	187,451





## 8.0. ENVIRONMENTAL AND HEALTH AND SAFETY PROTECTION

### 8.1. Environmental Issues

#### ENVIRONMENTAL AUTHORITIES IN CHARGE OF INSPECTIONS/CONTROLS ON THE SITES

The authorities in charge of environmental protection controls are the following Territorial Agencies of:

- Environmental Protection Inspectorate (IPM) Tg. Jiu;
- Environmental Guard (GM) Tg. Jiu;
- National Water Administration “Apele Române”- Jiu River Directorate in Craiova, and specifically Water Management Branch (SGA) Gorj;

#### WORK AND HEALTH PROTECTION AUTHORITIES IN CHARGE OF INSPECTIONS/CONTROLS ON THE SITES

The authorities in charge of health and work protection controls are:

- Gorj County Work Protection Inspectorate;
- Gorj County Public Health Directorate;
- Occupational Medicine State Inspectorate;
- Health Ministry/Gorj County State Inspectorate.

#### COMPLIANCE PROGRAMS AND OTHER REQUIREMENTS OF ENVIRONMENTAL PROTECTIONS INSPECTORATES

In order to obtain the environmental authorizations from the Territorial Agency for Environment Protection of the Jiu County, Electrocentrale Turceni, EMS Jilt and EMC Dragotesti had to commit to the following compliance programs as a condition for establishing the Turceni Energy Complex:

**Table 8.1: Turceni TPP Environmental Compliance Program**

Field of Intervention	Measure	Performance indicator	Costs / financing source	Deadline
Soil and Groundwater Pollution	Continue works for slag and ash removal from the Valea Ceplea Dump 1	Compliance with discharge limits included in the Water Management Authorization	45 bln. ROL (special fund) 36.5 bln. ROL (company's budget)	1991 / 2012
	Continue works for slag and ash removal from the dump 2 – cell 4	Compliance with discharge limits included in the Water Management Authorization	16 bln. ROL (company's budget)	1993/ 2005
	River bank works at the Jiu River in the Turceni area		5 bln. ROL (company's budget)	1984 /2010
	Modernization of electrostatic precipitators at unit 5	Compliance with in MWEP Order 462/1993	Program A3	1996 / Q I 2005



Field of Intervention	Measure	Performance indicator	Costs / financing source	Deadline
Contingency Planning and Fire Security	Construction of draining ditches; Increase safety in critical areas by river bank works	Flood protection		Permanent

*The Environmental Compliance Program has been authorized and signed by:  
eng. Andrei Nicu, Deputy Technical Director;  
eng. Octavian Barnanta, Director Repairs;  
eng. Liviu Cornea, Investment Director;  
eng. V. Banica, Chief Environmental Protection Dept.*

The Compliance Programs cited below are excerpts from older environmental authorizations obtained by CNLO for the Jilt Nord, Jilt Sud and Tehomir mining exploitations.

**Table 8.2: Jilt Open Cast Compliance Program**

Field of intervention	Measure	Performance indicator	Costs / financing source	Deadline
Soil and Groundwater Pollution	Recovery of 20 hectares of arable land in Jilt South quarry	Change of land surface destination to forestry and agricultural use	7 bln. ROL	2007
	Recovery of 90 hectares of forest and arable land in Jilt North quarry			2004 / 2006
Air Emissions	Installation of dust retainer system in Jilt North and South quarries	Compliance with limits in MWEP Order 592/2002	(TBD)	2005
	Covering transportation belts with protection tops	Compliance with noise limits in STAS 10009/1998	1.5 bln. ROL	2005

*The Environmental Compliance Program has been authorized and signed by:  
eng. Ceusescu Petre, Director;  
eng. Tanase Victor, Investment Chief;  
eng. Racovita Ion, Jilt South Quarry Chief;  
eng. Paraschivu Ion, Jilt North Quarry Chief*

Recommendations for the compliance program included in the Jilt open cast Impact Study performed by INSEMEX Petrosani address the following issues:

1. Installing dry dust removers and particulates removal at lignite transportation and loading;
2. Installing a noise-proof panels at coal storage and loading locations, in order to meet the STAS 10009/1998 noise norms;
3. Covering with rubber the area of impact where the coal is falling (at coal loading station) in order to reduce noise levels.

**Table 8.3: Dragotesti Coal Mine Compliance Program**

Field of intervention	Measure	Performance Indicator	Costs / Financing Source	Deadline All done?
Wastewater discharge	Installing for household wastewater's septic tank for the administrative headquarters	Compliance with wastewater discharge limits in NTPA 001/1997	0.2 bln. ROL	
	Cleaning of sewerage & drainage channels	Compliance with wastewater discharge limits in NTPA 001/1997	0.027 bln. ROL	Permanent
Air Emissions	Air pollution and noise monitoring	Compliance with noise limits in STAS 10009/1998	0.044 bln. ROL	Permanent
Work Health and Safety	Total work & health protection expenditures		5.2 bln. ROL	2003/2004

*The Environmental Compliance Program has been signed by:  
seng. Merluta Turdor, Dragotesti Labor Protection Compartment Chief*

#### ENVIRONMENTAL AUTHORIZATIONS NEEDED TO CONTINUE PRESENT OPERATIONS

##### Turceni TPP

The Ministry of Waters and Environmental Protection, through the Environmental Protection Inspectorate Targu-Jiu, has issued the Environmental Authorization No 956/30.10.2001, for the operation of the Turceni TPP, with 7 generating units for heat and power production. It is valid until 31.12.2005, and has not been amended after establishment of the TEC. The Compliance Program is described in Table 8.1 above.

##### Jilt Nord Mine

The MWEP through the Gorj Environmental Protection Agency has issued the Environment Authorization 887/25.10.2004. The total surface for the mine is 563 ha, with 420 ha in the exploitable perimeter. The authorization is described in Chapter 10 – Legal Aspects.

The Compliance Program attached as Annex 6 to the authorization is the following:

**Table 8.4: Jilt Nord Compliance Program**

No	Works to be performed	Surface	Deadline for finalization	In charge
1	Installation of dust retainers			Head of Dept
	- railway car loading point		31.12.2006	Labor Safety
	- crusher		31.12.2005	EM Jilt
2	Replacement of surfaces covered with asbestos cement plates and their adequate storage	700 m2	31.12.2008	Head of Quarry



No	Works to be performed	Surface	Deadline for finalization	In charge
3	Planting of green curtains around of coal storage.		31.12.2006	Department Development/Investment

Other obligations of the license holder include:

- Collection of used rubber conveyor belts in a storage for their later recycling;
- Permanent maintenance of collector canals;
- Recovery of fertile soil where it is recommended by pedology studies;
- Compliance with requirements of GD 124/30.01.2003 on prevention, reduction and control of asbestos pollution;
- Compliance with provisions of the article 39, 1(k), ( p) and (s) of Mining Law 85/2003.

### Jilt Sud Mine

The MWEF through the Gorj Environmental Protection Agency has issued the Environment Authorization 888/25.10.2004. The total surface for the mine is 563 ha, with 420 ha in the exploitable perimeter. The authorization is described in Chapter 10 – Legal Aspects.

The Compliance Program attached as Annex 6 to the authorization is the following:

**Table 8.5: Jilt Sud Compliance Program**

No	Works to be Performed	Surface	Deadline	In charge
1.	Ecological reconstruction			Department
	- reclaiming of agricultural land – internal dump	27 ha	31.12.2007	Development/Investment
2.	Installing dust retainers at:			Head of Dept
	- railway cars loading point		31.12.2006	Labor Safety
	- crusher		31.12.2005	EM Jilt
3.	Covering conveyor belt with dust and noise retaining covers	800 – 900 m	31.12.2005	EM Jilt Director
4.	Replacement of surfaces covered by asbestos cement plates and their adequate storage.		31.12.2008	Head of Mine
5.	Planting of green curtains around of coal deposit		31.12.2006	Department Development/Investment

Other obligations of the license holder include:

- collection of used rubber conveyor belts in a storage for their later recycling;
- permanent maintenance of collector canals;



- recovery of fertile soil where it is recommended by pedology studies;
- compliance with requirements of GD 124/30.01.2003 on prevention, reduction and control of asbestos pollution;
- compliance with provisions of the article 39, 1 (k), (p) and (s) of Mining Law 85/2003

**Dragotesti /Tehomir Mine**

The MWEP through the Gorj Environmental Protection Agency has issued the Environment Authorization 889/25.10.2004. The total surface for the underground mining is 20.5774 ha, with 14 ha occupied with building works. The authorization is described in Chapter 10 – Legal Aspects. The Compliance Program attached as Annex 6 to the authorization is the following:

**Table 8.6: Dragotesti / Tehomir Compliance Program**

No	Works to be performed	Surface	Deadline	In charge
1.	Replacement of surfaces covered by asbestos cement plates and their adequate storage		31.12.2006	Head of Mine
2.	De-clogging and re-commissioning of used water separator		31.07.2005	Head of Mine

**ENVIRONMENTAL ENDORSEMENT/CONSENT FOR PRIVATIZATION OF TEC**

On 20.12.2004, as a consequence of or upon request submitted by the Turceni Energy Complex, the Ministry of Environment and Water Management, through the Gorj County Agency for Environmental Protection, issued the Environmental Endorsement for privatization. Given the previous organization and allocation of main interest points, as well as the specializations, 6 separated endorsements have been issued:

- Complexul Energetic Turceni – Mine Dragotesti/Tehomir (underground mine)
- Complexul Energetic Turceni – Dump Bohorelu; (sterile land/overburden dump)
- Complexul Energetic Turceni – Mine Jilt Nord (open cast mining)
- Complexul Energetic Turceni – Mine Jilt Sud (open cast mining)
- Complexul Energetic Turceni – Apa Tismana (water supply)
- Complexul Energetic Turceni – Electrocentrale Turceni (power generation)

The conditions of the privatization environmental endorsements are:

- Submission to the Gorj County territorial agency for environmental protection of the application for environmental authorization of the indicated objective;
- Simultaneously, the holder of the authorization should indicate in writing to the environmental protection agency the obligations assumed by the parties in the sale-purchase contract in order to implement provisions of the compliance program, including repair of environmental damages produced by previous activities.



**Table 8.7**

Measure	Environmental Obligations	Provisions for Compliance Program and Deadlines
1	2	3
Soil, underground and underground waters protection	<ul style="list-style-type: none"> <li>• Continuation of works for ash/slag evacuation at deposit no 1 Valea Ceplea, use of dense fluid evacuation discharge solution; sealing of deposit borders;</li> <li>• Continuation of works for ash/slag discharge / evacuation to deposit No 2 – cell 4, use of dense fluid evacuation solution;</li> <li>• Consolidation of down-the-river borders of the ash/slag deposit Valea Ceplea</li> <li>• Fortification of Jiu river valley in the area of the Turceni TPP</li> </ul>	<p>Compliance with operation conditions imposed by national and EU legislation Deadline: 2007</p> <p>Compliance with operational conditions imposed by national and EU legislation Deadline: 2007</p> <p>Prevention of landslides Deadline: 2006</p> <p>Avoidance of floods and overflows in the area Deadline: 2010</p>
Discharge of used waters	<ul style="list-style-type: none"> <li>• Compliance with norms imposed by NTPA 001/2002 and the Water Management Authorization</li> </ul>	<p>Rehabilitation of cooling installations Deadline: 2007</p> <p>Permanent</p>
Atmospheric emissions and absorptions	<p>Compliance with limit values imposed by GD 541/2003</p> <p>Compliance with conditions of Order of MWEP 592/2002</p>	<p>Implementation of investment for reducing the sulphure oxides SO<sub>2</sub> Deadline 2005-2010</p> <p>Rehabilitation and modernization of units 3 and 6 in Turceni TPP Deadline: 2006-2008</p> <p>Modernization of Electrostatic Precipitators at unit 5 Deadline: 2005</p>
Waste Management	<p>Making use of recyclable and reusable waste</p> <p>Waste Management monitoring / reporting as per GD 856/2002</p>	<p>Securing depositing and utilization of de-hydrated limestone resulted from FGDs Deadline: 2009</p> <p>Permanent</p>
Conditions for protection of human settlements	Compliance with environmental protection measures in populated areas neighboring the industrial centers	Permanent



Measure	Environmental Obligations	Provisions for Compliance Program and Deadlines
Others	<ul style="list-style-type: none"> <li>• Compliance with provisions of GD 95/2003 regarding control of activities that constitute dangers of causing major accidents, or MWEP Order 1083/2003 regarding the procedure for notifying major accidents</li> <li>• Compliance with provisions of Law 199/2000 regarding efficient energy use</li> <li>• Application for Integrated Environment Authorization</li> </ul>	<p>Drafting security report and submission to Gorj County Agency for Environmental Protection</p> <p>Deadline: 2<sup>nd</sup> quarter 2006</p> <p>6 months before signing SPA for TEC privatization</p>

Potential environmental liability:

- Restriction or complete close down of activities in case of a failure of water treatment installations, transport pipelines, ash/slag deposits, if their normal operation is not resumed within 24 hrs.
- Restoration of land and dwellings affected by water infiltrations generated by ash/slag deposit no 1 Valea Ceplea and hydropower works on the Jiu River in the Turceni area.

**Table 8.8: Jilt Sud Open Cast Mining**

Measures	Environmental Obligations	Provisions for the compliance program and implementation deadlines
1	2	3
Soil, and underground waters protection	<ul style="list-style-type: none"> <li>• Returning to the industrial use internal dumping area of 27 ha</li> <li>• Putting plants for curtains used for protection at the coal stack</li> </ul>	<p>Deadline: 2007</p> <p>Deadline: 2006</p>
Discharge of used waters	<ul style="list-style-type: none"> <li>• Compliance with norms imposed by NTPA – 001/2002 and the Water Management Permit</li> </ul>	Permanent



Measures	Environmental Obligations	Provisions for the compliance program and implementation deadlines
Atmospheric emissions and absorptions	<p>Compliance with conditions imposed by MWEF Order 592/2002</p> <p>Compliance with provisions of GD 124/2003 regarding prevention, reduction and control of environmental pollution with asbestos</p>	<p>Installation of dust retaining installations at the loading point in railway cars and crusher</p> <p>Deadline: 2005-2006</p> <p>Covering the conveyor belts with dust and noise covers on a length of 900 m</p> <p>Deadline: 2005</p> <p>Monitoring of emissions level</p> <p>Deadline: 2006</p> <p>Replacement of surfaces covered with asbestos cement plates and their adequate disposal</p> <p>Deadline: 2008</p>
Waste Management	Use of recyclable and reusable waste; Monitoring/reporting on waste management as per GD 856/2002	Permanent
Conditions for protection of residential communities	Compliance with environmental protection measures in populated areas neighboring the mining perimeter	Permanent
Others	<ul style="list-style-type: none"> <li>• Observance of provisions of law 199/2000 regarding efficient energy use</li> <li>• Application for Environment Authorization</li> </ul>	<p>Permanent</p> <p>6 months prior to signing SPA for privatization of TEC</p>

As regards potential environmental liability consequences:

- Restricting or complete closing down of activities in case of a failure, in case normal functioning is not restored within 24 hrs;
- Returning for farming/forestry use of a surface of 1077 ha after finishing exploitation of the coal layer.

**Table 8.9: Jilt Nord Open Cast Mining**

Measure	Environmental Obligations	Provisions for the compliance program and implementation deadlines
1	2	3
Soil, and underground waters protection	Putting plants for green curtains serving for protection at the coal stack	Deadline: 2006



Measure	Environmental Obligations	Provisions for the compliance program and implementation deadlines
Discharge of used waters	Compliance with norms imposed by NTPA – 001/2002 and the Water Management Permit	Permanent
Atmospheric emissions and absorptions	Compliance with conditions imposed by MWEF Order 592/2002  Compliance with provisions of GD124/2003 regarding prevention, reduction and control of environmental pollution with asbestos	Installation of dust retaining installations at the loading point in railway cars and crusher Deadline: 2005-2006  Covering the conveyor belts with dust and noise covers on a length of 900 m Deadline: 2005  Monitoring of emissions level Deadline: 2006  Replacement of surfaces covered with asbestos cement plates and their adequate disposal Deadline: 2008
Waste Management	Use of recyclable and reusable waste; Monitoring/reporting on waste management as per GD 856/2002	Permanent
Conditions for protection of human settlements	Compliance with environmental protection measures in populated areas neighboring the mining perimeter	Permanent
Others	Compliance with provisions of Law 199/2000 regarding efficient energy use  Application for Environment Authorization	Permanent  6 months prior to signing SPA for TEC privatization

In case of non-compliance or failure the Energy Complex may face restriction or complete closing down of activities if a normal functioning is not restored within 24 hrs. After finishing exploitation of the coal layer there is an obligation to return for farming/forestry use of a surface of 420 ha.

**Table 8.10: Tehomir/Dragotesti Underground Mining**

Measures	Environmental Obligations	Provisions for the compliance program and implementation deadlines
1	2	3
Soil, and underground waters protection	Monitoring the process of land degradation in the mining perimeter for a purpose of its restoration	Permanent



Measures	Environmental Obligations	Provisions for the compliance program and implementation deadlines
Discharge of used waters	Compliance with norms imposed by NTPA – 001/2002 and the Water Management Permit	De-clogging and re-commissioning of the used mine waters hydrostatic separator Deadline: 31.07.2005 Permanent
Atmospheric emissions and absorptions	Compliance with provisions of GD 124/2003 regarding prevention, reduction and control of environmental pollution by asbestos  Fulfillment of conditions of MWEF Order 592/2002	Replacement of surfaces covered with asbestos cement plates and their adequate disposal Deadline: 31.12.2006 Emissions monitoring Deadline: 2006
Waste Management	Use of recyclable and reusable waste; Monitoring/reporting on waste management as per GD 856/2002	Permanent
Conditions for protection of human settlements	Compliance with environmental protection measures in populated areas neighboring the mining perimeter	Permanent
Others	Compliance with provisions of law 199/2000 regarding efficient energy use  Application for Environment Authorization	Permanent  6 months prior to signing SPA for TEC privatization

After exploitation of the coal layer all land shall be returned to farming/forestry use.

**Table 8.11: External sterile Load /Overburden Dump Bohorelu**

Field	Environmental Obligations	Provisions for the compliance program and implementation deadlines
1	2	3
Soil, and underground waters protection	Reclaiming to the pre-mining status of 171 ha from external dump Bohorelu  Monitoring scope and work schedule of land reclamation.	Deadline: 2005 - 2008
Discharge of used waters	N/A	
Atmospheric emissions and absorptions.	Fulfillment of conditions of MWEF Order 592/2002	Permanent



Field	Environmental Obligations	Provisions for the compliance program and implementation deadlines
Waste Management	Use of recyclable and reusable waste; Monitoring/reporting on waste management as per GD 856/2002	Permanent
Conditions for protection of residential communities	Compliance with environmental protection measures in populated areas neighboring the sterile / overburden dump	Permanent
Others	Compliance with provisions of law 199/2000 regarding efficient energy use Application for Environment Authorization	Permanent 6 months prior to signing SPA for TEC privatization

After extraction of the coal layer 460 ha of land shall be returned to its pre-mining status.

**Table 8.12: Water Supply Tismana**

Measure	Environmental Obligations	Provisions for the compliance program and implementation deadlines
1	2	3
Soil, and underground waters protection	Bringing back to initial status land affected by maintenance and repair works for water supply pipelines	Permanent
Discharge of used waters	Compliance with limits imposed by NTPA 001/2002 and the Water Management Permit	Permanent
Atmospheric emissions and absorptions	N/A	
Waste Management	Use of recyclable and reusable waste; Monitoring/reporting on waste management as per GD 856/2002	Permanent
Conditions for protection of residential communities	N/A	
Others	Application for Environment Authorization	6 months prior to signing SPA for TEC privatization



**REQUIREMENTS OF ENVIRONMENTAL AUTHORITIES AS REGARDS COMPLIANCE WITH PROVISIONS OF THE ACQUIS COMMUNAUTAIRE**

By Address 1789/15.12.2005, the Ministry of Environment and Water Management, through the National Agency for Environmental Protection informed the Turceni Energy Complex Management on the outcome of the negotiations on Chapter 22 – Environment Protection – regarding Romania’s EU accession, in terms of obligations of TEC to respect the commitments of Romania, as follows:

**Table 8.13: Commitments regarding year of conformation la Limit Emission Values (LEV) for pollutants by Directive 2001/80/EC (Large Combustion Plants - LCP)**

LCP	Boiler	Thermal Power MWt?	Type/ Commissioning year or year of authorization	Fuel type	Year of conformation to LEV for pollutants under Directive 2001/80/EC		
					SO <sub>2</sub>	NO <sub>x</sub>	Dust
SC Complex Energetic Turceni SA No 2	Boiler No3 1035 t/h	789 x 2	1 / 1980	Lignite/liquid fuel/natural gas	31.12.2010	***	31.12.2010
	Boiler No 4 1035 t/h						
SC Complex Energetic Turceni SA No 3	Boiler No 5 1035 t/h	789 x 2	1 / 1980	Lignite/liquid fuel/natural gas	31.12.2010	***	31.12.2007
	Boiler No 6 1035 t/h						

\*\*\* Turceni Energy Complex has stated that provisions of Directive 2001/80/EC are fulfilled for these installations

**Table 8.14: Emissions Levels Ceilings Allowed for Large Combustion Installations During 2007-2013 and During 2016 – 2017**

Year	SC Complex Energetic Turceni No 2 Emissions (tons/year)			SC Complex Energetic Turceni No 3 Emissions (tons/year)			SC Complex Energetic Turceni No 4 Emissions (tons/year)		
	SO <sub>2</sub>	NO <sub>x</sub>	Dust	SO <sub>2</sub>	NO <sub>x</sub>	Dust	SO <sub>2</sub>	NO <sub>x</sub>	Dust
2007	40640.89	8008	892	27321.43	5315	350	2229	4294	799
2008	31403.02	5159	455	62774.94	10203	584	26606	4294	799
2009	34467	5178	373	69157	10278	545	10249	1524	190
2010	38353	10400	599	38194	10364	550	0	0	0
2011	38041	10567	610	6725	10419	595	0	0	0
2012	37066	10595	452	36737	10447	594	0	0	0
2013	3611	10605	482	6742	10466	608	0	0	0



Year	SC Complex Energetic Turceni No 2 Emissions (tons/year)			SC Complex Energetic Turceni No 3 Emissions (tons/year)			SC Complex Energetic Turceni No 4 Emissions (tons/year)		
2014	-	-	-	6749	7669	598	0	0	0
2015	-	-	-	6762	7688	600	0	0	0
2016	-	-	-	6762	4680	600	0	0	0
2017	-	-	-	6762	4680	600	0	0	0

In case of not meeting the commitments, the competent authorities will be obliged to apply corrective measures, including suspension of activity and closure of the large combustion installation.

Regarding implementation of Directive 2001/80/EC, TEC has requested a derogation for Unit 7, numbered here as large combustion installation no 4:

**Table 8.15**

LCP	Boiler	Thermal Power MWt	Type LCP/commissioning year of year of authorization	Fuel type
SC Complex Energetic Turceni SA No 4	Boiler No 7 1035 t/h	789	1/1987	Lignite/liquid fuel/natural gas

TEC has been requested to submit by 31.12.2004 a notification regarding the derogation foreseen in GD 541/2003 (art 5.2 and 5.3) to the Regional Agency for Environment Protection Craiova, regarding the limitation of the total operational time of Unit 7 to maximum 20.000 h for the period until 2015. The notification has been submitted in due time.

In response, TEC has been notified that Unit 1, representing LCP no 1, has to be shut down before 31.12.2007. TEC has not requested derogation for this unit.

## Main Environmental Impacts

### *On Air*

**Emissions of GHG (Greenhouse Gases):** There are 6 main gases, which are considered responsible for the greenhouse gas effect: water vapors, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrogen protoxide (N<sub>2</sub>O), ozone (O<sub>3</sub>), non-methane volatile organic compounds (NMVOCs) and halogenated compounds.

In the case of Turceni TPP, the main contribution to the GHG emissions is from lignite combustion in boilers, vehicle combustion, and water vapors generation directly or indirectly in the water-cooling systems and by leaks.

According to TPP management a rough estimate of the GHG emissions per year 2002, done by theoretical calculations showed the emission of CO<sub>2</sub> at 6,389,854.1 tones

The 2<sup>nd</sup> level environment balance performed in 2001 by Fitpol srl and Geoconsulting srl indicated vehicle internal traffic as secondary source for GHG gases (CH<sub>4</sub>, N<sub>2</sub>O, NMVOC) with the following estimated hourly emission rates:



- CH<sub>4</sub>: 0.3 g/h;
- N<sub>2</sub>O: 2.1 g/h;
- NMVOC: 7.8 g/h.

There are also emissions of CFCs (Cl, Br, F), which were not quantitatively estimated.

During 2004, TEC has emitted in atmosphere about 599,2443 tons of CO<sub>2</sub>, according to management calculations.

In case of Jilt open cast, no GHG gases are released into the atmosphere, due to the technology used of open mining. At Dragotesti underground coalmine, low quantities of CH<sub>4</sub> are produced, when opening new boards by detonation:

- CH<sub>4</sub> – 0.4 g/h (0.013 mg/m<sup>3</sup>).

Besides the pollution from coalmines core activities, there are very small GHG (CH<sub>4</sub>, N<sub>2</sub>O, and NMVOC) emissions released from diesel oil and gasoline used by mining vehicles

**Emissions of Particulate Matters:** According to the same sources (Turceni TPP management) particulate matter emissions for 2002 were 3,785.85 tones. Limit values for large combustion plants of 1<sup>st</sup> category (over 500 MW<sub>th</sub>), according to the GD 541/2003 are for particulate matter 50 mg/Nm<sup>3</sup>.

Turceni TPP has its own emission monitoring system, based on measurement equipment (flue gas analyzers) and emission data processing software. Recent measurements performed in 2003 and 2004 show the following suspended particulate average concentrations released by each power generation unit (UNIT):

- UNIT 1: 132.5 mg/Nm<sup>3</sup>
- UNIT 3: 123 mg/Nm<sup>3</sup>
- UNIT 4: 86.5 mg/Nm<sup>3</sup>
- UNIT 6: 124 mg/Nm<sup>3</sup>
- UNIT 7: 108.7 mg/Nm<sup>3</sup>.

The thermal power plant also has secondary particulate emission sources. The 2<sup>nd</sup> level environment balance performed in 2001 by Fitpol srl and Geoconsulting srl indicates coal storage where an hourly estimation has been performed (10.3 kg/h at coal unloading and 3.6 kg/h for coal driving on stacks), as well as coal crunching, where de-dusters have been installed (85% efficiency dust cyclones), reducing the particulate emission concentration from 168 to 33.6 mg/Nm<sup>3</sup>. There are also low particulate emissions released from vehicles of internal traffic. An estimated hourly emission rate shows a 7.5 g/h value.

Both coal mines of Turceni Energy Complex release important quantities of particulate matter, almost in all phases of their technological processes. Higher values of suspended particulates were recorded at lignite transportation on belt conveyers and loading in rail wagons. A set of certain measurements has been performed, with respect to residual particulates. The measurement locations were chosen as the closest private dwellings to the quarries, and the concentrations have exceeded the NTPA limit value of 17 g / m<sup>2</sup> month.

The Integrated Environmental Monitoring Department of EPA Gorj has monitored residual particulates emissions in the Jilt open cast at two points. The conclusions of this monitoring are the following:

- The allowable concentration (MAC) of 17 g/m<sup>2</sup>/month has been exceeded 7 times in 2002, and 5 times in 2003 at the Jilt Nord locations. One of these values exceeds 6 times the MAC.



- The allowable concentration has been exceeded 11 times in 2002, and 9 times the MAC in 2003 at the Jilt Sud locations.

Measurements performed at Dragotesti underground coalmine site show concentrations for suspended particulate matter, about 3 times lower than the concentration limit in force of 150 mg/Nm<sup>3</sup>, as follows:

- PM30 – 52.67 mg/Nm<sup>3</sup>
- PM10 – 45.99 mg/Nm<sup>3</sup>.

During year 2004, according to TEC management calculations, the Turceni TPP emitted some 2,264 tons of dust (particulate matters).

**Emissions of non-GHG:** According to plant management, emissions of SO<sub>2</sub> from major sources (the 4 flue gas stacks) in 2002 were 77,427.6 tones. The NO<sub>x</sub> released amounted 15,836.19 tones. Limit values for large combustion plants of 1<sup>st</sup> category (over 500 MW<sub>th</sub>), according to the GD 541/2003 are for sulphure oxides (as equivalent SO<sub>2</sub>) 400 mg/Nm<sup>3</sup>; and for nitrogen oxides 500 mg/Nm<sup>3</sup>.

The measurements performed in 2003 and 2004 show the following SO<sub>2</sub> and NO<sub>x</sub> average concentrations released by each power generation unit (unit):

- SO<sub>2</sub>
  - UNIT 1: 4,072.9 mg/Nm<sup>3</sup>;
  - UNIT 3: 4,844.7 mg/Nm<sup>3</sup>;
  - UNIT 4: 4,678.4 mg/Nm<sup>3</sup>;
  - UNIT 6: 3,492.6 mg/Nm<sup>3</sup>;
  - UNIT 7: 4,595.9 mg/Nm<sup>3</sup>;
- NO<sub>x</sub>
  - UNIT 1: 426.6 mg/Nm<sup>3</sup>;
  - UNIT 3: 474.5 mg/Nm<sup>3</sup>;
  - UNIT 4: 531.5 mg/Nm<sup>3</sup>;
  - UNIT 6: 402.6 mg/Nm<sup>3</sup>;
  - UNIT 7: 423.7 mg/Nm<sup>3</sup>;

According to TEC management calculations, during year 2004, Turceni TPP has emitted in the atmosphere 14,173 tons of NO<sub>x</sub> and 92,611 tons of SO<sub>2</sub>.

The above mentioned 2<sup>nd</sup> level environment balance indicates as a secondary non-GHG emission sources sodium hydroxide and hydrogen chloride storage, heavy fuel oil storage (hydrocarbon volatiles emission) and vehicle internal traffic (SO<sub>2</sub>, NO<sub>x</sub>, CO, NH<sub>3</sub>, Cd, Cu, Cr, Ni, Se, Zn, PAH). Estimated hourly emission rates (by using US-EPA / AP 42 methodology) were:

- NaOH 72 g/h
- HCl: 128 g/h
- HC volatiles: max.9 kg/h
- SO<sub>2</sub>: 16.7 g/h
- NO<sub>x</sub>: 66 g/h
- CO: 41.7 g/h



- NH<sub>3</sub>: 0.013 g/h
- Cd: 0.017 g/h
- Cu: 2.9 g/h
- Cr: 0.008 g/h
- Ni: 0.013 g/h
- Se: 0.017 g/h;
- Zn: 1.7 g/h;
- PAH: 4.2 g/h.

In case of Jilt open cast, no non-GHG gases are released. At Dragotesti mine, low concentrations of H<sub>2</sub>S, SO<sub>2</sub> and NO<sub>x</sub> are recorded when new boards are opened by detonation:

- H<sub>2</sub>S – 2.9 g/h (0.09 mg/m<sup>3</sup>)
- SO<sub>2</sub> – 1.4 g/h (0.045 mg/m<sup>3</sup>)
- NO<sub>x</sub> – 37.7 g/h (1.17 mg/m<sup>3</sup>).

Given the low frequency of this operation, one can assess the H<sub>2</sub>S, SO<sub>2</sub> and NO<sub>x</sub> released as negligible.

**Fly ash from slag/sterile dumps/deposits:** Dump no. 1 Valea Ceplea has 3 compartments (250 hectares) and is fully utilized. According to the ISPE (Institute of Power Studies and Design) Study on Environmental Impact of the Slag and Ash Dump in Valea Ceplea (2001), it has been concluded that the particulate matters entrained by wind in the neighboring areas contribute significantly to the increase of the air corrosion for the building materials in the Turceni municipality.

It was evaluated by calculations that, under various atmospheric conditions, the ambient air concentrations of PM<sub>2.5</sub>, PM<sub>10</sub> and PM<sub>30</sub> will exceed the admissible limits by factors, which may vary from 2 to 20 times the limits.

At Jilt open cast, sterile load extracted during lignite excavation process is transported on belt conveyers and disposed into the inner and external Bohorelu dumps. High concentrations of suspended particulates were recorded near transportation and disposal sites.

### *Soil Contamination*

**Main Thermal Power Plant site:** Several soil investigations were performed during the last 5-7 years on the Turceni TPP site, but all of them focused only on metals and mineral compounds at limited depths (up to 0.3-0.35 m bgl). The results indicated an overall compliance with allowable thresholds for industrial sites as required by MWEP Order 756/1997.

After site investigations performed in 2000, it was concluded that only the sulphure content in soils has increased since the last test in 1996, both in concentrations and in areas impact. No information is available on the possible individual sources of influence from the main site.

**Ash deposits under development:** Slag/ash Dump 1 (Valea Ceplea), with a designed area of 250 ha, affects the groundwater level in the area, because it is using for hydro transport around 12,000,000 m<sup>3</sup> of water out of which 3% is to be found in the drainage system of the Turceni area.

A localized pollution of the water with heavy metals occurs in the dump foundation, but the groundwater contamination was not observed in the Turceni residential area, due probably to multiple water infiltrations through sand layers.



Regular measurements are conducted for the quality of the water sampled from the slag dump in V. Ceplea, as well as from the drainage system in the Turceni area. Groundwater level is also measured in monitoring wells in Turceni town and adjacent area of the slag dump in Valea Ceplea. It was mentioned that the groundwater levels rose over the last years, thus causing important problems for the residential areas in Turceni.

After performance of a complex study by Geotec Bucharest and other companies and institutes, it was preliminarily concluded that no association could be made between the elevated groundwater levels in the residential areas and the presence of the slag and ash dumps in Valea Ceplea. After negotiations with MWEP representatives, a pilot project was done on lining the permeable layers of the dump dikes and a groundwater draining / abstraction system, the latter being put in operation in September 2003.

All site investigations on groundwater quality revealed that the impact is more quantitative rather than qualitative, by increasing the shallow groundwater layers. Anyway, as Romania has no limit values for shallow groundwater (not subject to use for potable purposes), so no clear assumption on the qualitative impact could be made yet.

Heavy metals concentrations were measured regularly and below are given the average detected concentrations (ISPE study – 2001) vis a vis s thresholds for industrial sites, as provided by MWEP Order 756/1997):

- Cu 30 mg/l	MAL 250 mg/l
- Zn 72.6 mg/l	MAL 700 mg/l
- Pb 37.5 mg/l	MAL 250 mg/l
- Co 15.4 mg/l	MAL 100 mg/l
- Ni 55.8 mg/l	MAL 200 mg/l
- Mn 537.2 mg/l	MAL 2000 mg/l
- Cd 0.78 mg/l	MAL 5 mg/l

Chemical characteristics of the dump re-circulated water, which entered the groundwater system, are as listed below (to be noted that no further evaluation could be made, as Romania has no regulations covering the quality of non-potable groundwater in industrial sites):

- pH	7,1 - 9 mg/l
- free CO <sub>2</sub>	17 - 30 mg/l
- Alkalinity “p”	0 milival/l
- Alkalinity “m”	1,4 - 2 mg/l
- Bicarbonates	80 130 mg/l
- Hardness, temporary	3,9 - 6 mg/l
- Hardness, permanent	60 80 °G
- Calcium	400 - 460 mg/l
- Magnesium	70 - 115 mg/l
- Chlorides	150 - 190 mg/l
- Sulphates	1100 - 1500 mg/l



**Existing ash deposits:** Slag/ash Dump no. 2, is partially closed for compartment no. 1, 2 and 3, which are totally covering an area of approx. 107 hectares. Compartment no. 4 (110 hectares) has yet to be build..

Compartment nos. 1,2 and 3, with a total surface of 107 ha, has probably affected the groundwater level in the area at the time of its operation, the large amount of water in the range of 12,000,000 m<sup>3</sup> (similar to the slag dump 1 in the area of Turceni). Regarding the characteristics of heavy metals or those of the recirculated water there is, in the Management's opinion, no reason to estimate other approximate values than those specific to the slag dump no. 1.

**Jilt Open Cast site:** A significant impact on affected soil is given by open pit mining: 1800 hectares of land were affected in the Jilt open cast, out of which 1590 hectares of agricultural land and 210 hectares of forests. The whole ecosystem has been disturbed in the area by deforestation and soil removal. The hydrographic system has also been changed. Aquifers were changed and artificially reshaped by sterile load dumping.

The category of environmental rehabilitation works in the environmental compliance schedule and in the annual investment plans according the requirements of the MWEP/NAMR common Order nr.22740/2001 include soil remediation works.

Agricultural land recovery (cleaning-up operations) process anticipates a remediation cycle of 3 years. Reclaimed land is given back to the local authorities for redistribution to the people that were expropriated. 158 hectares were recovered in 2003: out of which 73 hectares of agricultural land and 85 hectares of forests. The impact of mining on the local communities resulted in the creation of two new villages, to where 200 families have settled. Other 180 families decided to move to town (Targu Jiu).

Future reclaimed land is included in the annual investment plans. In 2004, 35 hectares have been redistributed to the agricultural use at Bohorelu dump.

**Dragotesti coalmine site:** Non-residential agricultural and forestry lands may be affected by mining activities and potential impact on soil, due to the short distance to the residential area (300 – 400 m). In order to reduce the mining impact and to prevent collapse of the overburden (sterile load), 30 m or 50 m mining pillars are provided in the underground mining area. Specific protecting construction works to prevent landslides were built above ground, including support walls, ditches, and channels to eliminate accumulation of water ponds and to prevent water infiltration of the mine.

Now, about 18 hectares of land in Dragotesti village are affected. The company pays annual compensations, amounting 175 million lei in 2003. Major soil pollution by coal particulates deposits occurs in the vicinity of the transportation systems, the coal storage and at the loading point. Rainfall may drive coal particulates into Jilt River.

## **Water**

At TPP site, water supply is provided:

- For industrial water through the intake on Jiu River.
- For potable water from deep groundwater source (80-100m bgl) by 5 wells of about 5 l/s.

Wastewater discharge is done by collection/discharge channels directly into the Jiu River. The following wastewater streams – as per Environmental Impact Study done by ICIM – Bucharest - are discharged:

- Household wastewater having the following quality (figures on the right represent regulatory limits in NTPA 001):
  - Fixed residue                      278 – 745mg/l                      (2000)



- 
- Suspended matter      10 – 214mg/l      (35-60)
  - COD Mn                6 – 21mg/l      (-)
  - BOD<sub>5</sub>                 10 – 35mg/l      (20-25)
  - Extractible            0 – 1mg/l      (20)
  - pH                      7,2 – 7,7      (6.5-8.5)
- Wastewater from the condensers having the following quality (figures on the right represent regulatory limits in NTPA 001):
- fixed residue            265 – 690 mg/l      (2000)
  - suspended matter      24 – 178 mg/l      (35-60)
  - COD Mn                3,2 - 17 mg/l      (-)
  - BOD<sub>5</sub>                 10 – 35 mg/l      (20-25)
  - Extractible            1 – 2 mg/l      (20)
  - Cl<sup>-</sup>                    34 – 51 mg/l      (500)
  - SO<sub>4</sub>                    40 – 235 mg/l      (600)
  - Fe<sup>+2+3</sup>                0,65 – 1,78 mg/l      (5)
  - pH                      7,3 - 8,3      (6.5-8.5)
- Wastewater from the chemical treatment plant having the following quality (figures on the right represent regulatory limits in NTPA 001):
- fixed residue            314 – 7700 mg/l      (2000)
  - suspended matter      46 – 850 mg/l      (35-60)
  - COD Mn                2,7 - 33 mg/l      (-)
  - extractible            2 – 3 mg/l      (20)
  - Cl<sup>-</sup>                    80 – 8875 mg/l      (500)
  - SO<sub>4</sub>                    81 – 3200 mg/l      (600)
  - Fe<sup>+2+3</sup>                0,78 – 15 mg/l      (5)
  - pH                      10 - 11      (6.5-8.5)

These wastewaters are less aggressive for the receptor (Jiu River) due to mixing it in the collection/discharge channels (dilution rate is about 1:5).

At Jilt open cast site, measurement results show frequent exceeding of the allowable values for suspended solid materials. The causes could be clogging of settling dumps, deposits on the collecting channels carried away by wastewaters and abundant rainfall (for industrial effluents), and sediment in excess in the septic tanks (for households' waste water).

The industrial wastewater quality indicators recorded by the laboratory of the S.G.A. Gorj during the 2<sup>nd</sup> quarter of 2003 have the following average values:

- Jilt Nord mine
  - pH: 7.5
  - CCOCr (COD): 21.2 mg/l



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- Fixed residue: 433.2 mg/l
  - Chlorides: 10.5 mg/l
  - Sulphates: 94.6 mg/l
  - Calcium: 94.5 mg/l
  - Magnesium: 21.1 mg/l
  - Phenols: 0.06 mg/l
  - Total iron: 0.2 mg/l
  - Suspended solids: 43.5 mg/l.
- Jilt Sud mine
    - pH: 7.2
    - CCOCr (COD): 20.0 mg/l
    - Fixed residue: 209.5 mg/l
    - Chlorides: 11.3 mg/l
    - Sulphure: 37.0 mg/l
    - Calcium: 51.5 mg/l
    - Magnesium: 11.1 mg/l
    - Phenols: 0.06 mg/l
    - Total iron: 0.2 mg/l
    - Suspended solids: 38.0 mg/l.

SGA Gorj also performed tests on domestic waste-water effluents with the following average results:

- Jilt Nord mine
  - pH: 7.0
  - CCOCr (COD): 33.3 mg/l
  - CBO5 (BOD): 16.7 mg/l
  - Fixed residue: 154.3 mg/l
  - Chlorides: 15.0 mg/l
  - Sulphate: 29.1 mg/l
  - Nitrogen: 3.9 mg/l
  - Extractible: 0.008 mg/l
  - Total phosphorous: 0.8 mg/l
  - Detergents: 0.01 mg/l
  - Suspended solids: 43.7 mg/l.
- Jilt Sud mine
  - pH: 7.0



- 
- CCOCr (COD): 40.2 mg/l
  - CBO5 (BOD): 17.7 mg/l
  - Fixed residue: 208.7 mg/l
  - Chlorides: 11.9 mg/l
  - Sulphate: 37.3 mg/l
  - Nitrogen: 4.5 mg/l
  - Extractible: 0.006 mg/l
  - Total phosphorous: 0.6 mg/l
  - Detergents: 0.03 mg/l
  - Suspended solids: 36.7 mg/l.

There was also a slight exceeding of limits by total phosphorous indicator at both mines. Since not occurring systematically, it could be considered as negligible.

At Dragotesti coalmine site, the quality of the wastewater is monitored by the SGA Gorj laboratory of the local branch of the National Authority Apele Romane (The Water Management Agency Jiu Craiova). The monitoring schedule includes taking samples once a month. The results of wastewaters' quality tests performed during January – April 2003 show the following values:

- Industrial waste water
  - pH: 7.4
  - Fixed residue: 609.5 mg/l
  - Chlorides: 22.2 mg/l
  - Sulphates: 152.2 mg/l
  - Calcium: 28.3 mg/l
  - Magnesium: 0.1 mg/l
  - Phenols: 0.2 mg/l
  - Suspended solids: 71.0 mg/l.
- Household waste water
  - pH: 7.1
  - CBO5 (BOD): 15.8 mg/l
  - Fixed residue: 186.0 mg/l
  - Ammonia: 1.8 mg/l
  - Total nitrogen: 2.6 mg/l
  - Total phosphorous: 0.5 mg/l
  - Suspended solids: 47.8 mg/l.



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## ***Noise and Vibrations***

At TPP site, as no residential areas are located in the close vicinity of the power plant, a noise pollution poses problems only from the occupational health and safety point of view. From the occupational health and safety standpoint, all workplaces where the noise level reaches maximum allowed level (87 dBA) should be fitted with noise level reduction devices.

Several onsite measurements were performed. The most recent information made available by the Turceni TPP staff (September 2003) shows non-compliance with occupational noise nuisance levels of several workplaces, where noise levels recorded values in the range of 85.7 and 105.1 dBA.). Some of these areas were also investigated for work protection risks in order to provide the field employees that are exposed to noise with personal protective equipment (PPE).

The main noise sources at Jilt Open Cast site are excavators and dumpers, belt conveyers, vehicles and loading equipment. The excavators and dumpers work inside the mine, far away from residential areas and have no impact on it. Belt conveyers are the main noise sources when crossing Matasari and Bradet villages.

The noise level generated by belt conveyers reaches the level of 80 dB in the close vicinity. When belt-driving parts are worn out, the noise intensity increases. Romanian standard STAS 10009-82 stipulates 50 dB as the allowable upper limit for noise level inside plants. There was certain noise exceeding recorded at both mines populated vicinities (55 - 67 dB) in the 2003 year, as shown below:

- belt conveyers and loading point of railcars, Jilt Nord – 58 dB
- belt conveyers and loading point of railcars, Jilt Sud – 64 dB
- belt conveyers from Bohorelu exterior sterile dump – 67 dB.

At Dragotesti mine site, typical noise and vibrations sources are: cutting, loading and entry driving machines, belt conveyers, and transportation vehicles and loading equipment. The majority of equipment, which is used underground has no external impact. Residential area is far from the working area and vegetation is buffering noise and vibration from mining operations.

## ***Radioactivity***

No radioactivity measurements were performed so far in the areas analyzed.

As no measurements were done yet for the assessment of the radiation level at the two slag and ash dumps, as well as at Jilt open cast and Dragotesti mine and sterile dumps, it might be recommended to perform at least a set of preliminary measurements in this field.

## **Estimated Costs for Compliance with Environmental Standards, According to the Approved Environmental Compliance Program:**

The following measures and costs represent only the remaining part of the existing Environmental Compliance Program attached to the actual Environmental Authorization. Measures and costs associated to the Environmental Privatization Permit will probably significantly differ from these, as they will be based upon the new legislation in force, more restrictive than in 2001.

- Works for slag and ash dump 2, cell 4.1 completed, cell 4.2 ongoing; estimated costs 7.3 bln. ROL
- Installation of water meters for raw water and for effluents discharged – technical design is assigned to ISPE Bucharest
- Development of a drainage system for shallow groundwater level control in the residential area of Turceni - 95% completed; costs 7.5 bln. ROL.



With privatization in mind, the TEC management has developed an Environmental Compliance Program for Privatization.

## **8.2. Health & Safety Issues**

Organizational aspects with respect to the Health and Safety are based on the H&S Law 90/1996 and the General Health and Safety Guidelines issued in 2002. All in-house staff responsible for H&S issues is regularly trained and evaluated.

### **PAST SITUATION (BEFORE TPP AND MINES INTEGRATION INTO TEC - 2004)**

The *Health and Safety Committee* of Turceni TPP consisted of 6 members and was managed by the company General Director. The Committee had regular meetings (usually quarterly). The Committee decisions were then implemented by specialized staff.

At Jilt open cast and Dragotesti mine, in order to reach the Health and Safety policy goals, the mine directors used the following administrative units:

- *Work Protection Compartment* supported decision in work protection field, evaluated occupational risks at mine's workplaces and proposed risk mitigation actions
- *Work & Health Medical Service* was organized as a medical room provided with primary emergency equipment. It monitored the health state of mine workers, the hygiene of sanitary annexes and provided emergency services in case of acute intoxications or accidents
- *Health and Safety Committee* was established in order to achieve improvement of working conditions, to fulfill the proposed health & safety objectives. The committee's members were nominated by the director and ordinary meetings were held quarterly.

Annually, several programs and action plans were adopted, consisting in measures covering the following relevant aspects: technical safety, HVAC, hygiene and sanitation, personal protective equipment (PPE), backup utilities supply, employee training and communication etc. The action plans and programs were generally based on proposals of the site employees and on the job hazard analysis.

According to the Internal Guidelines on PPE, all relevant employees received the necessary protective equipment at no charge, as approved by the H&S Committee, based on the assessment done by a specialized commission. The same was with the sanitation and hygiene materials, as approved by the occupational medicine office. Each workplace was equipped with emergency intervention lifeguard kits. All the company staff was subject to an annual medical examination. Periodically, several sets of indoor air emission measurements were undertaken.

### **PRESENT SITUATION (AFTER TEC ESTABLISHMENT – 2004)**

Last summer, the Turceni Energy Complex General Manager issued two decisions with subsequent implications on restructuring the OHS sector. After May 27<sup>th</sup>, 2004, when the Administration Board was convoked and the new organizational structure of the energy complex was set up, on June 14<sup>th</sup>, General Manager Decision no.304 established the OHS Service at the energy complex level.

The OHS Service consists of work security compartments at each direction (Energy and Mining) Directions and one Occupational Health compartment.

OHS restructuring was followed by a second decision (502/August 3<sup>rd</sup>, 2004), when the Health and Safety Committee was founded. This committee is led by TEC General Manager and is composed by OHS Service staff, as well as plant and mine employees' representatives.



The main activity of the Health and Safety Committee is to define the general rules based on which the strategy in this area is set up, to check up and finally approve the strategy and to create the necessary conditions to implement it.

The ordinary meetings of the Committee take place every four months. Extraordinary meetings can also be held any time an important matter occurs. The strategy and the related programs are based on analyses and evaluations made up for every specific workplace and take in consideration the real conditions as well as the likely associated risks.

The strategy is mainly focused on certain areas such as:

- Employees health and safety training
- Risk prevention
- Safety activities related to the technical side of the industrial processes
- Adequate workplaces ventilation
- Hygiene and sanitary services
- Protection of food and equipment.

In 2004, 13 persons have suffered work accidents, leading to a total of 911 days of work incapacity indicated in the medical certificates. 5 have returned to work, the others are still on medical leave.

### 8.3. Significant Environmental Issues and Costs for Turceni Energy Complex (TEC)

#### SIGNIFICANT ENVIRONMENTAL ISSUES

**The dust and noxious gas emissions** primarily and directly pollute the air and then the soil, water, water table with consequences on ecosystems and human health. In 2002 for example, Turceni TPP has polluted the environment with 77,425 tones of SO<sub>2</sub>, 15,834 tones of NO<sub>x</sub>, 3,787 tones of dust and 6,389,851 tones of CO<sub>2</sub>. According to GO 541/17.05.2003 Romania has implemented EC Directive no. 2001/ 80/ regarding the establishing of measures for limiting the emissions of the mentioned pollutants.

According to the GO 541/17.05.2003 clause 6 (1), Turceni TPP has to elaborate in maximum 6 months since entry into force date of the government programs for progressive annual emissions reduction for SO<sub>2</sub>, NO<sub>x</sub> and dust. Compliance with limits imposed by EC Directive 2001/80 should be accomplished by Turceni Complex before 31.12.2010. The following table outlines the situation of noxious gas emissions of the units currently in operation.

**Table 8.16: Situation of Noxious Gas Emissions of Power Generating Units Currently in Operation**

No.	Unit	Noxious Gas Emissions (mg/Nm <sup>3</sup> )	Limits Imposed by EC Directive 2001/80/(mg/Nm <sup>3</sup> )
1.	Unit no.1	SO <sub>2</sub> : 3658 - 4694 NO <sub>x</sub> : 373 - 470 Dust : 97 - 135	SO <sub>2</sub> : 400 NO <sub>x</sub> : 500 Dust : 50
2.	Unit no.3	SO <sub>2</sub> : 3672 - 4764 NO <sub>x</sub> : 405 - 453 Dust : 94 - 112	SO <sub>2</sub> : 400 NO <sub>x</sub> : 500 Dust : 50



No.	Unit	Noxious Gas Emissions (mg/Nm <sup>3</sup> )	Limits Imposed by EC Directive 2001/80/(mg/Nm <sup>3</sup> )
3.	Unit no.4	SO <sub>2</sub> : 3230 - 4353 NO <sub>x</sub> : 399 - 540 Dust : 60 - 90	SO <sub>2</sub> : 400 NO <sub>x</sub> : 500 Dust : 50
4.	Unit no.6	SO <sub>2</sub> : 3884 - 4401 NO <sub>x</sub> : 355 - 496 Dust: 102 - 141	SO <sub>2</sub> : 400 NO <sub>x</sub> : 500 Dust : 50
5.	Unit no.7	SO <sub>2</sub> : 3632 - 4595 NO <sub>x</sub> : 320 - 474 Dust : 98 - 140	SO <sub>2</sub> : 400 NO <sub>x</sub> : 500 Dust : 50

<sup>1</sup> the costs and data are based on the Turceni TPP own proposal for Environmental Compliance Program for Privatization, as well as on cost estimation for Jilt open cast and Dragotesti mine

**Restructuring, demolition, dismantling:** According to Turceni Complex Privatization Program, Units no.1 and 7 will be decommissioned in 2008 and 2011, respectively, whereas Unit no. 2 has already been closed down. According to senior management, after TPP's restructuring, a large part of today's facilities will no longer in use.

**Thermal pollution of the Jiu river waters:** Taking into account the fact that during summer time the temperature of discharge waters exceeds the limit imposed by the water management permit, i.e. 35°C, Turceni TPP has to improve its cooling systems by executing repair works to the cooling towers.

#### **SIGNIFICANT MEASURES TO BE ACCOMPLISHED AND COSTS**

A list of main obligatory environmental protective measures and corresponding costs for Turceni Energy Complex include the following:

In order to comply with limits imposed by EC Directive 2001/80 Turceni Complex has elaborated a **program of measures for emissions reduction:**

#### **Flue Gas Desulphurisation:**

The timetable for the flue gas desulphurization for the 4 selected units envisaged to continue operating is as follows:

- Desulphurisation for Unit no. 3 - 2008-2010 – estimated value - \$76 m.
- Desulphurisation for Unit no. 4 - 2006-2008 – estimated value - \$76 m.
- Desulphurisation for Unit no. 5 - 2006-2008 – estimated value - \$76 m.
- Desulphurisation for Unit no. 6 - 2008-2010 – estimated value - \$76 m.

Total amount earmarked for the desulphurisation of the 4 units = \$304 m.

#### **Dust Reduction:**

In order to reach the desired dust reduction targets Turceni has to modernize its electrostatic precipitators. The time table for this modernization program is as follows:



- Modernization of the electrostatic precipitators to Unit no. 3 - 2008 – estimated value - \$4.6 M.
- Modernization of the electrostatic precipitators to Unit no. 4 - 2009 – estimated value – \$1.0 M.
- Modernization of the electrostatic precipitators to Unit no. 5 - 2004 – estimated value - \$4.5 M.
- Modernization of the electrostatic precipitators to Unit no. 6 - 2006 – estimated value - \$4.6 M.

Total amount earmarked for dust reduction for the 4 units = \$14.7 m.

### ***The Amount of Money Paid to the Environmental Fund According to Law 293/2002***

The unpaid sum due to the Environmental Fund for noxious emissions (SO<sub>x</sub>, NO<sub>x</sub>, CO<sub>2</sub>, CO) and dust from June 2002 to October 2003 equals approx. \$0.88m; an approximate annual payment is about of \$0.6m. It is to be based on a rate of 1 tone of equivalent CO<sub>2</sub> = 1/330 \$, which may significantly increase in the near future in integrated EU. For its year 2004 activity, the Turceni Energy Complex has paid to the environmental fund the amount of 21,881,195,986 ROL.

### **Slag and fly ash dumps necessary measures:**

- Slag and fly ash discharge works to the dump no.1 (Valea Ceplea) - compartment no.1 (upgrading works, dump extension) in 2003 – 2012; estimated value – \$47.01 m.
- Slag and fly ash discharge works to the dump no.2 - compartment no.4 (upgrading works) in 2003 – 200; estimated value – \$21.92 m.
- Remediation of slag and ash dump no.2, compartments 1,2 and 3; estimated value according to ISPE project – \$1.5 m.

**Restructuring, demolition, dismantling necessary protective measures and costs:** The restructuring, demolition and dismantling of the unnecessary units and other parts of Turceni plant should be done only in accordance with a plan coordinated with the investor development strategy. The corresponding costs could be defined only by specialized companies.

**Protective measures and costs referring to thermal pollution of the Jiu river waters:** The temperature of discharge waters has to be below the limits imposed by the water management permit, i.e. 35°C, so Turceni plant has to improve its cooling systems by implementing heavy repair works to the cooling towers.

Estimates of the he costs regarding heavy repair works to the cooling towers are as follows:

- Restoration of cooling installations – tower no. 3 (ISPE project) - 2003 – estimated value – \$1.03 m.;
- Restoration of cooling installations – tower no. 6 - 2005 – estimated value – \$1.03m;
- Restoration of cooling installations – tower no. 5 - 2006 – estimated value – \$1.03m;
- Restoration of cooling installations – tower no. 1 - 2007 – estimated value – \$1.03m;

Total estimated value for restoration of cooling installations = \$4.12m.

### **Reduction of Noise Levels:**

In order to assess the occupational health hazard of onsite employees, a regular noise level measurement program has to be implemented for Turceni plant, focusing on the turbines-adjacent areas. Based on the results of the measurements personal protective equipment for employees working in areas with noise levels above the admissible limit of 85 dB may need to be provided.

### **Periodic and regular environmental monitoring as follows:**



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### **Water Monitoring Requirements, for:**

- Quality of the recycled water at the Slag and Ash Dump 1 – Valea Ceplea
- Shallow groundwater quality and level in all monitored wells on the closure dike of V. Ceplea Slag and Ash Dump and its banks
- Elevation measurements to assess ground dynamics (on both vertical and horizontal directions)
- Shallow groundwater quality and level in all monitored wells in the residential area of Turceni
- Shallow groundwater quality and level in all monitored wells in the adjacent area of V. Ceplea Slag and Ash Dump
- Quality of raw water and wastewater discharged from/into Jiu River, according to the provisions and requirements of the Environmental Authorization and Water Management Authorization
- Operational monitoring of the neutralization tanks (pH monitoring to ensure legal compliance)
- Monthly checks on water volumes taken from the onsite water wells for potable and industrial water.
- Quality of industrial and domestic wastewater discharged by both mines (Jilt and Dragotesti) into Jilt River, according to the provisions and requirements of the Environmental Authorization and Water Management Authorization

### **Air Emissions and Ambient Air Monitoring, for particulate matter in the following points:**

- Turceni V(2000 m), Turceni 549 V(1300 m)
- Turceni V. Ceplea (2000 m), Sat Jilt (3000 m), Brosteni N (1500), Cursaru E (1100 m), Iliesti SV (3000 m), Ionesti S (6000 m)
- Particulate matter near Jilt Nord mine (Turturea village) and Jilt Sud mine (Stoichitioiu village), as well as in the vicinity of belt conveyers and at the exterior Bohorelu dump
- Operational monitoring of electrostatic precipitators with for purpose of a permanent assessment of ash removal efficiency
- Regular monitoring of the collection and purification system for the exhaust air from the stage I of coal drying process.

### **Other monitoring and surveillance activities:**

- Continuous monitoring in the area adjacent to the TPP, focusing on heavy metals and sulphates in soil (recommended on the same 36 soil profiles used in the previous investigations in Environmental Balance Level II performed by FITPOL SRL and GEOCONSULTING SRL)
- Regular inspection of heavy fuel oil separator and storage tanks in order to detect possible physical damages or breaks
- In the area of fuel storage tanks, oil separators and on the right-of-way of the heavy fuel oil transport pipes, periodic tests of soil and groundwater should be performed at all sites (Turceni plant, Jilt and Dragotesti coal mines). Same should be done with the area where the chemical water treatment plants are located on.

As a conclusion, a fair estimate of **the environmental investment needs for Turceni TPP would be around of USD 400-450 million.**





## 9.0. FINANCIAL STATEMENTS AND INFORMATION

### 9.1. Audited Financial Statements (Opening Balances) of TEC as of April 1, 2004

The audited opening balance sheet of the new company – TEC – is presented in accordance with to the Romanian Accounting Standards (Order of the Ministry of Public Finance no. 94/2001) and was audited by KPMG Audit SRL.

**Table 9.1: Balance Sheet as of April 1, 2004**

<i>all amounts in RON thousand</i>	April 1, 2004
<b>ASSETS</b>	
<b>Fixed Assets</b>	
Tangible fixed assets	1,207,152
Land	56,071
Intangible fixed assets	855
<b>TOTAL Fixed Assets</b>	<b>1,264,078</b>
<b>Current assets</b>	
Inventory	70,846
Receivables	443,261
Cash and cash equivalents	2,383
Prepayments	51
<b>TOTAL Current assets</b>	<b>516,541</b>
<b>TOTAL ASSETS</b>	<b>1,780,619</b>
<b>EQUITY AND LIABILITIES</b>	
<b>Equity</b>	
Share capital	455,520
Revaluation reserves	562,914
Other Reserves	169,660
Retained Earnings	2,129
<b>TOTAL Equity</b>	<b>1,190,223</b>
<b>Non Current Liabilities</b>	
Deferred tax	
Long term portion of interest bearing borrowings	7
<b>Total Non Current Liabilities</b>	<b>7</b>
<b>Current Liabilities</b>	
Payables	589,692
Short term part of interest bearing loans	697
<b>TOTAL Current Liabilities</b>	<b>590,389</b>
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>1,780,619</b>

*Source: Audited financial statements as at April 1, 2004*



## 9.2. Turceni Energy Complex – Complexul Energetic Turceni SA (TEC) – 1 April to 31 December 2004

### AUDITED FINANCIAL STATEMENTS OF TEC AS OF DECEMBER 31, 2004

The financial statements were prepared by the Company in accordance with the Romanian Accounting Standards (Order of the Ministry of Public Finance no. 94/2001) and were audited by KPMG Audit SRL.

**Table 9.2: Balance Sheet as of December 31, 2004**

*all amounts in RON thousand*

December 31, 2004

<b>ASSETS</b>	
<b>Fixed Assets</b>	
Tangible fixed assets	1,236,106
Land	63,798
Intangible fixed assets	685
<b>TOTAL Fixed Assets</b>	<b>1,300,589</b>
<b>Current assets</b>	
Inventory	90,534
Receivables	426,070
Cash and cash equivalents	35,891
Prepayments	147
<b>TOTAL Current assets</b>	<b>552,642</b>
<b>TOTAL ASSETS</b>	<b>1,853,232</b>
<b>EQUITY AND LIABILITIES</b>	
<b>Equity</b>	
Share capital	455,520
Revaluation reserves	562,914
Other Reserves	207,716
Retained Earnings	46,700
<b>TOTAL Equity</b>	<b>1,272,850</b>
<b>Environmental provision</b>	<b>9,684</b>
<b>Non current liabilities</b>	
Deferred tax	77
Trade and other payables	271,034
Long term portion borrowings of interest bearing borrowings	-
<b>Total non current liabilities</b>	<b>271,111</b>
<b>Current Liabilities</b>	
Trade and other payables	299,588
Short term portion of interest bearing borrowings	-
<b>TOTAL Current Liabilities</b>	<b>299,588</b>
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>1,853,232</b>

*Source: Audited trial balance as at December 31, 2004*



**Table 9.3: Profit and Loss Account for the 9-month period ended December 31, 2004**

*all amounts in RON thousand*

9-month period ended  
December 31, 2004

Sales	545,607
Cost of sales	-423,547
<b>Gross margin</b>	<b>122,060</b>
Other operating income	64,157
General and administrative expenses	-4,008
Other operating expenses	-91,957
<b>Profit before interest, tax and depreciation</b>	<b>90,252</b>
Depreciation expense	-50,881
<b>Operating profit</b>	<b>39,371</b>
Financial loss	-1,389
<b>Profit before tax</b>	<b>37,982</b>
Income tax	-13,182
<b>Net profit</b>	<b>24,800</b>

*Source: Audited trial balance as at December 31, 2004*

#### **INDEPENDENT AUDITOR'S REPORT**

The balance sheet of the Company as at December 31, 2004, as well as the profit and loss account, the statement of changes in equity and the cash flow statement for the 9-months period beginning on 1 April 2004 (Company's incorporation date) and ending on 31 December 2004 have been prepared in accordance with Romanian Accounting Standards and have been audited by KPMG Audit SRL who issued a qualified opinion mainly due to the effects of the following matters:

- The opening balance sheet of the Company as at April 1, 2004 contains uncertainties due to the fact that the Company did not apply IAS 36 "Impairment of assets", differences between accounting value and the actual status of land owned by Jilt Surface Mine, lack of attendance by the auditor in relation to the stock count, lack of provision for slow moving inventory, discrepancies between accounting records and confirmations received from numerous suppliers and lack of environmental provisions in accordance with IAS 37 "Provision, contingent liabilities and contingent assets". Any adjustment resulting from these matters could impact the result for the period.
- As KPMG were appointed as auditors subsequent to December 31, 2004 they could not attend the stock-count carried out by the Company and could not apply other procedures which could have led to satisfactory results regarding the existence of inventories amounting to RON 90,534 thousand. Any adjustment of this balance sheet item could affect retained earnings.



- As at December 31, 2004 the Company has recorded as assets plots of land from the Jiltu coal mine amounting to RON 9,672 thousand. The independent auditor could not be satisfied as to the existence and valuation of these fixed assets, as well as to the Company's claims over such assets.
- According to the International Accounting Standard IAS 36 „Impairment of Assets”, the Company should have estimated the recoverable amount of its assets. However, such estimation was not performed as it is likely that the future amendments to the tariffs, authorized by the National Electricity Regulator („ANRE”), may not be enough to recover the value of these assets. As a consequence the financial statements do not contain any adjustments to reflect the impairment of assets, considered material by the independent auditors.
- As at 31 December 2004, as a result of Termoelectrica SA writing-off certain debt owed by TEC, the Company has registered income of RON 24,791 thousand. Due to the fact that these debts were related to investment for the modernization of units 4 and 5, the write off should not have been registered in the current period income entirely, but part of the respective amount should have been considered as deferred revenues and gradually recorded in the income statement proportionally with the depreciation of the fixed assets financed through this credit. The Management considers this accounting treatment to be in compliance with the Order of Ministry of Economy and Commerce - Ministry of Finance no. 1236/154/2004.

Without further qualifying the financial statements, the independent auditor draws the attention to the following matters:

- As at December 31, 2004 the Company's share capital as stated in the balance sheet amounts to RON 455,520 thousand is different from the amount stated in the incorporation documents and Trade Registry records. The Company's share capital consists of the share capital of Electrocentrale Turceni SA and the share capital of Jilt and Dragotesti mines based on the balance sheet as at 31 December 2003. As per the Company's incorporation documents and provisions of Government Decision no.103/2004, the share capital of the Company amounts to RON 456,741 thousand and its final value will be established after the completion of the take over protocols related to assets and liabilities, in accordance with the legal provisions.
- As at December 31, 2004 the Company has recorded as sundry creditors the amount of RON 69,521 thousand as a result of the spin-off from Compania Nationala a Lignitului Oltenia SA of the Jilt and Dragotesti coal mines as at 1 April 2004, with which Company's equity is to be increased in the forthcoming period.

## **ACCOUNTING PRINCIPLES AND POLICIES**

### **Accounting Principles:**

The main accounting principles and policies adopted for the preparation of the Company's financial statements for 2004 are the following:

- *Going Concern* – The Company's financial statements were prepared based on the assumption that the Company is ordinarily viewed as continuing in business for the foreseeable future with neither the intention nor the necessity of liquidation, ceasing trading or seeking protection from creditors pursuant to laws or regulations. Accordingly, assets and liabilities are recorded on the basis that the entity will be able to realize its assets and discharge its liabilities in the normal course of business.
- *Prudence* – The Company has included a degree of caution in the exercise of judgments in relation to estimates required under conditions of uncertainty, such that assets or income are not overstated and liabilities or expenses are not understated.



- *Substance over form* – The Company has taken into consideration that transactions and other events are accounted for and presented in accordance with their substance and economic reality and not merely their legal form.
- *Accrual basis* – The Company has recognized transactions and events when they occurred and not as cash or its equivalent is received or paid. These are recorded in the accounting records and reported in the financial statements of the periods to which they relate. Expenses are recognized in the income statement on the basis of a direct association between the costs incurred and the earning of specific items of income (matching).
- *Offsetting* – The Company did not perform any offsetting of assets and liabilities, expenses and incomes except for those permitted by Ministry of Finance Order No. 94/2001.
- *Materiality* – The Company has presented each material class of similar items separately in the financial statements.
- *Consistency of Presentation* – The presentation and classification of items in the financial statements has been retained from one period to the next.

### **Accounting Policies:**

#### ***Reporting currency***

The financial statements have been issued in ROL and presented in this document in RON (Romanian New Lei) thousand.

#### ***The Hyperinflation Economy Accounting Standards***

The Company has operated in a hyperinflationary environment until the beginning of 2004.

Management considers that the Company's measurement currency, as defined by SIC 19 "Reporting Currency – Measurement and Presentation of Financial Statements Under IAS 21 and IAS 29", is ROL ("Romanian Leu"), justified by the majority of transactions having ROL as reference currency.

In accordance to SIC 19 the financial statements must be presented in a functional currency and restated in accordance with IAS 29. Company's management has decided to prepare the financial statements based on historical cost, without applying IAS 29. This accounting treatment is in accordance with legal provisions.

#### ***Fundamental Errors and Changes in Accounting Policies***

Errors in the preparation of the financial statements of one or more prior periods may be discovered in the current period. Errors may occur as a result of mathematical mistakes, mistakes in applying accounting policies, misinterpretation of facts, fraud or oversights. The correction of these errors may be done either by including them in determining the net profit or loss for the current period or by adjusting the opening balance. The Company has applied IAS 8 by adjusting the retained earnings opening balance with the correction amount for changes in accounting policy.

#### ***Tangible and Intangible Fixed Assets***

Tangible assets are presented in the balance sheet at their cost less the accumulated depreciation and any provision for impairment. The initial cost is established based on the acquisition price and includes the differences from previous revaluations (Government Decisions 945/1990, 26/1992, 500/1994, 983/1998, 403/2000). There was no fixed assets revaluation during the period April 1 – December 31, 2004.



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Intangible assets consist of licenses, software and patents. Their initial cost is established based on the acquisition price.

### ***Maintenance and Repair Expenses***

Expenditure on repairs or maintenance of property, plant and equipment is made to restore or maintain the future economic benefits that the Company can expect from the originally assessed standard of performance of the asset. As such, it is usually recognized as an expense when incurred.

### ***Depreciation***

Depreciation is calculated using the straight-line method, based on useful economic life of fixed assets in accordance with the provisions of Law No. 15/1994, as follows:

- Buildings: 20-50 years
- Plant and equipment: 8-20 years
- Vehicles and transportation: 4-5 years
- Furniture and office equipment: 3-15 years

Fixed assets are depreciated starting with the next month from purchase/set up date. Land and work in progress are not depreciated.

The useful life for intangible assets is established in accordance with Government Decision No 909/1997.

### ***Inventories***

Materials and spare parts are registered at production cost or purchase value.

The cost of inventory is established by using the FIFO method, in some cases specific identification being required.

The Company values the coal inventory based on the energy release value of the raw material; this value is also the basis for the purchase price. The heat value of the purchased coal is measured by the technical experts within the Company, after each delivery. The coal consumption is calculated and recorded by using the weighted average cost method.

### ***Accounts Receivable***

Accounts receivable are recorded in the balance sheet at their recoverable value.

### ***Cash and Cash Equivalents***

Cash and cash equivalents include the current accounts with banks in RON, petty cash and advances to employees.

### ***Accounts Payable***

Accounts payable and other debts are registered at cost.



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### ***Subsidies***

The Company's investments (rehabilitation of Unit no.5) are financed through a grant allocated from the Special Fund for the Development of the Energy System, set up by the Ministry of Industry and Resources.

### ***Provisions***

A provision is recognized in the balance sheet when the Company has a liability as a result of a past event and an outflow of economic benefits is likely to be necessary in order to settle this obligation.

### ***Income Recognition***

Income consists mainly of electricity sales. In this case income is recognized when monthly invoices are issued for energy deliveries. Income is recognized when there are no significant uncertainties regarding their realization. The Company applies the cut off principle for income and expense recognition.

### ***Taxation***

The income tax for the period comprises current and deferred tax. The income tax is recognized in the income statement, except to the extent that it relates to items recognized directly in equity, in which case it is recognized in equity.

Current tax is the expected tax payable on the taxable income for the period, using tax rates applicable or substantially applicable at the balance sheet date, and any adjustment to tax payable in respect of prior periods.

Deferred tax is computed in accordance with the balance sheet liability method, providing for all temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. The amount of deferred tax provided for is based on the expected manner of realization or settlement of the carrying amount of assets and liabilities, using tax rates applicable or substantially applicable at the balance sheet date.

A deferred tax asset is recognized only to the extent that it is probable that future taxable profits will be available against which the unused tax losses and credits can be utilized. Deferred tax assets are reduced to the extent that it is no longer probable that the related tax benefit will be realized.

The effect of any change in taxation rates on deferred tax is reflected in the profit and loss account, except in the cases when it relates to items previously recognized directly to equity.

### ***Financial Result***

Financial result contains all financial income/expenses for the year 2004. The cut off principle is also applied for these income/expenses.

### ***Interest Bearing Borrowings***

The loans which bear interest are initially recognized at their cost, less the costs related to the respective transaction. After initial recognition, the interest bearing loans are recognized at amortized cost, any difference between the cost and the redemption value being recognized in the profit and loss account during the loan period and based on the effective interest rate.



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### ***Transactions in Foreign Currency***

Transactions in foreign currency are recorded at the exchange rate from the transaction date. Assets and liabilities denominated in foreign currency are presented at their ROL value as of the balance sheet date and the exchange rate differences are recorded in the profit and loss account.

### ***Impairment of Assets***

The carrying amount of Company's assets, other than inventory (see "Inventory" accounting policy) and the deferred tax assets is reviewed at each balance sheet date to determine whether there is any indication of impairment. If any such indication exists, the asset's recoverable amount is estimated. An impairment loss is recognized whenever the carrying amount of an asset exceeds its recoverable amount.

### ***Recoverable Amount***

Short term receivables are not discounted.

Assets' recoverable amount is determined as the maximum between market value and the value in use. Value in use can be determined by discounting the estimated future cash flows to their present value, using a discount rate that reflect the time value of money and the assets' inherent risks. In case of an asset which does not generate identifiable cash flow, recoverable amount is determined for the asset's cash generating unit.

### ***Reversal Impairment Losses***

Impairment losses were recognized in the income statement whenever the carrying amount of an item of property and equipment and intangible assets exceeds its recoverable amount and when no revaluation reserves had been recognized on the assets in the previous periods.

Impairment losses are reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation and amortization, if no impairment loss had been recognized.

In respect of other assets, impairment losses are reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortization, if no impairment loss had been recognized.

### ***Related Parties***

Parties are considered related when one of the parties, by ownership, contractual rights, family connections or by other means, has the ability to control or to significantly influence the other party.

### ***Estimates***

In preparing the financial statements, management is required to make estimates and assumptions that affect the reported amounts of assets and liabilities as of the date of the balance sheet and revenue and expenses for the period. Actual results could differ from those. Estimates are used for provisions related to: land reclamation, agriculture, doubtful receivables, discounting of long term receivables, inventory write down, fixed assets depreciation/amortization and taxation.

The effect of a change in an accounting estimate is recognized prospectively by including it in the profit or loss account for:



- The period of the change, if the change affects that period only; or
- The period of the change and future periods, if the change affects both.

### ***Comparable Information***

The Company presents as comparable information the audited opening balances as at the set up date, i.e. April 1, 2004.

### ***Pension Obligations and Other Post Retirement Benefits***

The Company, in the normal course of business makes payments to the Romanian State funds on behalf of its Romanian employees for pension, health care and unemployment benefits. All employees of the Company are members of the State pension plan. All relevant expenses are carried to the income statement on a regular basis.

The Company does not operate any independent pension scheme and, consequently, has no obligation in respect of pensions. The Company does not operate any other defined benefit plan or post retirement benefit plan. The Company has no obligation to provide further services to current or former employees.

## **BALANCE SHEET ANALYSIS**

### **Fixed Assets:**

The table below presents the split of tangible and intangible fixed assets by categories.

<i>all amounts in RON thousand</i>	December 31, 2004	April 1, 2004
<b>Table 9.4: Tangible and Intangible Fixed Assets</b>		
<b>1. Intangible assets</b>		
Cost	890	924
Accumulated amortization	-204	-69
<i>Net Book Value</i>	<i>686</i>	<i>855</i>
<b>2. Land</b>		
Cost	63,798	56,071
<i>Net Book Value</i>	<i>63,798</i>	<i>56,071</i>
<b>3. Buildings</b>		
Cost	581,160	561,860
Accumulated depreciation	-144,799	-131,529
Impairment losses	-3,415	-902
<i>Net Book Value</i>	<i>432,946</i>	<i>429,429</i>
<b>4. Equipment</b>		
Cost	877,361	868,040
Accumulated depreciation	-430,464	-383,069
<i>Net Book Value</i>	<i>446,897</i>	<i>484,972</i>
<b>5. Other tangible assets</b>		
Cost	75,472	68,690
Accumulated depreciation	-512	-409
Impairment losses	-475	-3
<i>Net Book Value</i>	<i>74,485</i>	<i>68,278</i>



<b>6. Work in progress</b>		
Cost	281,271	222,240
<i>Net Book Value</i>	281,271	222,240
<b>7. Down payments for fixed assets acquisition</b>		
Cost	506	2,233
<i>Net Book Value</i>	506	2,233
<b>Total Tangible Assets</b>		
Cost	1,815,771	1,723,063
Accumulated depreciation	-575,775	-515,006
Impairment losses	-3,890	-905
<i>Net Book Value</i>	1,236,106	1,207,152

Source: Notes to the audited financial statement as at December 31, 2004

During December 2004 the Energy Division of TEC finalized the activity of obtaining the ownership certificates for the pieces of land owned. A number of ownership certificates were also obtained for land owned by TEC – Jiltu coal mine.

The Management intends to increase the share capital with the amount representing the value of all land items for which ownership titles have been obtained as detailed in the tables below.

**Table 9.5: Land Valuation Report – Energy Division**

<i>all amounts in RON thousand</i>				Certificate		Value assessed	Value assessed
No.	Item	Description	Surface (sqm)	Series	No.	according to GD 500/1994	according to GD 983/1998
1	OB	CTE Turceni Precinct	1,598,521.34	MO3	9542	3,300	24,260
2	OB1	Main access road to CTE	7,246.16	MO3	9350	15	110
3	OB2	Secondary access road to CTE	712.74	MO3	9352	2	11
4	OB3	Eastern side access road to CTE	18,244.40	MO3	9346	38	277
5	OB4	Access road to the unfreezing tunnel no.1 and no. 2	1,477.44	MO3	9330	2	15
6	OB5	Access road to the unfreezing tunnel no.3	3,102.46	MO3	9348	5	34
7	OB6	Road between the coal warehouses	2,210.26	MO3	9541	3	24
8	OB7	Before the plant (platforms)	15,408.26	MO3	9331	32	234
9	OB8a	Hutting – site a	7,734.75	MO3	9363	13	92
10	OB8b	Hutting – site b	16,500.00	MO3	9332	27	197
11	OB11	Railroad	421,199.29	MO3	9540	407	2,992
12	OB13	Pile trestle for power supply of the water pump station	61.65	MO3	9329	0.1	1
13	OB14	Block of flats in Turceni city	4,504.79	MO3	9340	15	108
14	OB15	The SE Turceni colony in the passage way	31,179.74	MO3	9345	71	524
15	OB16	The dam on the Jiu River	22,111.96	MO3	9341	18	129
16	OB17	The Jiu River regulation	54,412.16	MO3	9353	43	316
17	OB19	The Water Delivery Channel from the source to CET	7.70	MO3	9362	0.008	0.006
18	OB21	Rain water pumping station	34.06	MO3	9354	0	1
19	OB22	Exhaust and energy disperser for tech. waters Et.II	1,323.36	MO3	9349	1	6
20	OB24	Est.slag cond..+cen.at V.Ceplea Dep.Tr.ISPE	48,430.44	MO3	9337	57	421



<i>all amounts in RON thousand</i>				Certificate		Value assessed	Value assessed
No.	Item	Description	Surface (sqm)	Series	No.	according to GD 500/1994	according to GD 983/1998
21	OB25	Cinder storage + plant no. 2, cells no. 1 and 2	627,704.93	MO3	9335	496	3,649
22	OB26	Recirculation pump station no 1	3,751.59	MO3	9363	5	33
23	OB28	Torrent deviation canal	151,553.80	MO3	9543	180	1,321
24	OB29	Urban main heat distribution pipelines	8,852.90	MO3	9347	9	63
25	OB30	Thermal pipes to defreezing tunnels no. 1 and 2	1,291.90	MO3	9336	1	9
26	OB31	Cinder and ash storage no. 2 cell no. 3	455,039.99	MO3	9625	360	2,645
27	OB32	Defreezing tunnel no. 3	45,494.55	MO3	9338	64	470
28	OB33	Shallow wells in Turceni	843.02	MO3	9361	2	12
29	OB34	Cafeteria in Turceni	1,478.78	MO3	9339	5	35
30	OB35	Electric power station for recirculation pump no. 2	4,515.11	MO3	9344	4	26
31	OB36	Household water treatment plant in Turceni	10,719.74	MO3	9367	21	152
32	OBA	Colony household sewage	117.32	MO3	9334	0,2	1
33	OBI	Cinder and ashes storage no. 2 cell no. 4	922,550.82	MO3	9544	851	6,256
34	OB42A	Left bank dam	39,446.89	MO3	9326	43	318
35	OB42B	Left bank dam	100,724.57	MO3	9333	111	813
36	OB43	Protection bank	62,940.68	MO3	9351	69	508
37	OB44	Jiu brook regulation	55,843.13	MO3	9343	66	487
38	OB45	The common house in Turceni	5,112.57	MO3	9366	17	122
39	OB46	The production base and colony in Turceni	134,454.33	MO3	9328	278	2,041
40	OB47	Shallow wells enclosure	98,091.69	MO3	9342	116	855
41	OB49	ACH Cafeteria	3,744.98	MO3	9364	5	35
42	OB	Turceni Dam (Reservoir)	728,208.35	MO3	9327	1,119	8,230
43	OB	Cinder and ash storage in Valea Ceplea	2,667,030.18	MO3	8188	4,100	30,142
<b>TOTAL</b>						<b>11,971</b>	<b>87,975</b>

Source: Memorandum for share capital increase

**Table 9.6: Land Valuation Report – Jilt Coalmine**

<i>all amounts in RON thousand</i>				Value assessed	Value assessed
No.	Description	Surface (sqm)	Certificate	according to GD 500/1994	according to GD 983/1998
1	Main lines	171,385.88	MO3/7730/12.08.2002	15	111
2	E.M.Jilt Precinct	6,415.45	MO3/7733/12.08.2002	22	162
3	Jilt Sud Precinct	26,510.02	MO3/7732/12.08.2002	46	340
4	Jilt Nord Precinct	281,770.09	MO3/7731/12.08.2002	25	182
<b>TOTAL</b>				<b>108</b>	<b>794</b>

Source: Memorandum for share capital increase



**Table 9.7: Additions and Disposals of Tangible and Intangible Fixed Assets**

all amounts in RON th. Assets	Cost					December 31, 2004
	April 1, 2004	Additions	Transfers		Disposals	
			From work in progress	Accounts reclassifications		
<b>I. Intangible Assets</b>						
Intangible assets	924	-	35	-	-337	622
Work in progress	-	268	-	-	-	268
<b>Total Intangible Assets</b>	<b>924</b>	<b>268</b>	<b>35</b>	<b>-</b>	<b>-337</b>	<b>890</b>
<b>II. Tangible Assets</b>						
Land	56,071	7,728	-	-	-	63,798
Building	561,860	-	20,570	-	-1,270	581,160
Equipments	868,040	9	9,316	-1	-3	877,361
Measuring and control devices	8,002	14	354	8	-5	8,372
Vehicles	59,476	72	6,321	-	-2	65,868
Other tangible assets	1,211	-	32	-7	-4	1,232
Work in progress	222,240	96,614	-36,628	1,721	-2,677	281,270
Down payments for tangibles acquisition	2,233	-	-	-1,721	-6	506
<b>Total Tangible Assets</b>	<b>1,779,133</b>	<b>104,437</b>	<b>-350</b>	<b>-</b>	<b>-3,966</b>	<b>1,879,569</b>
<b>Total</b>	<b>1,780,057</b>	<b>104,704</b>	<b>-</b>	<b>-</b>	<b>-4,303</b>	<b>1,880,459</b>

Source: Notes to the audited financial statement as at December 31, 2004

Tangible fixed assets are stated at cost less accumulated depreciation and impairment losses. The cost value consists of acquisition price and previous revaluations (GD 954/1990, GD 26/1992, GD 500/1994, GD 983/1998, GD 403/2000). No fixed assets revaluations took place during the period April 1 – December 31, 2004.

The intangible fixed assets consist mainly of software licenses as well as topographic surveys and land documentations, research studies and forest protection taxes, related to the coalmines. Their value is determined based on the acquisition prices.

Work in progress additions consist of investments in energy production assets such as Unit 5 rehabilitation program amounting to RON 75,245 thousand and the second stage of the TPP technological upgrade (Units 5-8) amounting RON 14,584 thousand.

Transfers of work in progress to buildings and technical equipment mainly represent works finished at the Company's ash and slag storage facility from Valea Ceplea.

**Table 9.8: Fixed Assets Depreciation**

all amounts in RON thousand Assets	Accumulated depreciation and impairment losses			
	April 1, 2004	Additions	Disposals	December 31, 2004
<b>I. Intangible assets</b>	<b>-69</b>	<b>-135</b>	<b>-</b>	<b>-204</b>
<b>II. Tangible assets</b>	<b>-515,006</b>	<b>-60,777</b>	<b>8</b>	<b>-575,775</b>
Buildings	-131,529	-13,271	0	-144,799
Equipment	-383,068	-47,401	5	-430,464
Other tangible assets	-4,088	-1,056	26,418	-512
<b>Total</b>	<b>-515,075</b>	<b>-60,913</b>	<b>16</b>	<b>-575,979</b>



Impairment losses	-905	-	-	-3,890
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Source: Notes to the audited financial statement as at December 31, 2004

Depreciation is computed using the straight line method, based on the assets useful economic life in accordance with Law No. 15/1995 provisions as follows:

- Buildings: 20-50 years
- Machinery: 8-20 years
- Vehicles: 4-5 years
- Furniture and office equipment: 3-15 years.

**Table 9.9: Inventory**

<i>all amounts in RON thousand</i>	December 31, 2004	April 1, 2004
Raw materials – coal	33,758	18,486
Consumables	46,299	37,005
Loose tools	593	351
Work in progress	0	0
Finished goods	7,254	10,537
Residual products	4	589
Inventories in custody	2,518	3,726
Package materials	86	153
Advances to inventory suppliers	24	-
<b>Total</b>	<b>90,534</b>	<b>70,846</b>

Source: Notes to the audited financial statements as at December 31, 2004

The Company has borrowed as at December 31, 2004 143,768 tons of coal and 1,500,000 tons of heavy oil derivatives from the national reserve set up by State Reserves National Administration.

Slow-moving inventory and static inventory during the last year mainly relates to spare parts necessary to ensure timely repairs of the energy production equipment.

**Table 9.10: Accounts Receivable**

<i>all amounts in RON thousand</i>	December 31, 2004	April 1, 2004
Trade receivables	338,586	351,614
Allowance on doubtful receivables	-2	-3
Sundry debtors	81,259	88,163
Allowance on sundry debtors	-147	-
Unsettled VAT	7,690	1,538
Other receivables	-1,317	1,949
<b>Total</b>	<b>426,070</b>	<b>443,261</b>

Source: Notes to the audited financial statements as at December 31, 2004



## Trade Receivables:

**Table 9.11: Trade Receivables Ageing as at December 31, 2004**

<i>all amounts in RON thousand</i> Client	Less than 30 days	30 - 180 days	180 - 360 days	Over 360 days	Total
Transelectrica București	3,669	-	-	-	3,669
SC DFEE Electrica Buc.	53,207	211,617	-	-	264,825
Hidroelectrică Buc	3,041	3,276	41,149	-	47,466
RAAN Severin	7,100	-	-	-	7,100
SC Gevco Cluj	7,743	-	-	-	7,743
Romelectro Buc	3,303	-	-	-	3,303
S C Energy Holding	2,831	-	-	-	2,831
SC EGL Gas Power	913	-	-	-	913
Others	601	73	31	31	736
<b>Total</b>	<b>82,326</b>	<b>214,967</b>	<b>41,180</b>	<b>31</b>	<b>338,586</b>

Source: Details provided by the Company

**Table 9.12: Trade Receivables Ageing as at April 1, 2004 (Energy Division only)**

<i>all amounts in RON thousand</i> Client	Less than 30 days	30 - 90 days	90 - 365 days	Over 365 days	Total
SC DFEE Electrica Buc.	49,777	147,189	31,879	4,945	233,790
Hidroelectrică Buc	-	-	96,616	-	96,616
CNTEE Transelectrica	3,322	-	-	-	3,322
SC Remat Gorj	72	-	-	-	72
SC Laromet SA Buc.	30	-	-	-	30
Acasalterm Turceni	11	17	-	-	28
Grup Școlar Ind.	4	-	-	-	4
SC Nord Invest SRL	4	-	-	-	4
Spitalul Turceni	2	-	-	-	2
SC E Rovinari	-	-	-	-	-
Others	3	-	-	-	3
<b>Grand Total</b>	<b>53,226</b>	<b>147,206</b>	<b>128,497</b>	<b>4,945</b>	<b>333,871</b>

Source: Details provided by the Company

No major changes occurred in the trade receivables balance during the period ended 31 December 2004.

**Table 9.13: Sundry Debtors**

<i>all amounts in RON thousand</i>	December 31, 2004	April 1, 2004
Termoelectrica	80,651	85,176
Termoserv Turceni	309	189
Other sundry debtors – production and investments	300	2,799
<b>Total</b>	<b>81,259</b>	<b>88,163</b>

Source: Audited trial balance as of December 31, 2004

The amounts from sundry debtors mainly consist of amounts to be recovered from Termoelectrica and represent the value of the energy supplied by TEC to Termoelectrica during the period when it was a division of Termoelectrica, as well as payments made by TEC related to loans incurred during 1991 -



2002 by Termoelectrica in relation to fuel supply and plant rehabilitation. At the same time, as detailed at *Other Creditors*, TEC owes RON 48,512 thousand to Termoelectrica as at 31 December 2004 for loans contracted by Termoelectrica and taken over by TEC through the assets/liabilities transfer protocol concluded between the two entities.

As at December 31, 2004 TEC has net debt of RON 32,139 thousand to Termoelectrica. During April 2005 both companies have agreed in writing their mutual debts as at December 31, 2004.

#### MAIN CUSTOMERS

The top three customers by the sales value during April 1 – December 31, 2004 and January, 1 – May 31, 2005 are presented in the table below:

**Table 9.14: Top Customers by Sales Value**

<i>all amounts in RON thousand</i> Client	Energy sales for the 9-month period ended December 31, 2004	Energy sales for the 5-month period ended May 31, 2005
Electrica	486,436	196,784
Hidroelectrica	5,308	9,899
Transelectrica	32,062	30,748
<b>Total first 3 customers</b>	<b>523,806</b>	<b>237,431</b>
(%) out of total sales	96%	61%

*Source: Details provided by the Company*

#### Collection of Receivables by Set-offs:

For the three top customers of the Company – presented above – the collection of receivables is made using an offsetting mechanism managed by MEC where payables and receivables of various companies are compensated.

The proportion of receivables collected through the offset mechanism is presented in the tables below:

**Table 9.15: Total Set-offs of Receivables for April 1 – December 31, 2004**

<i>all amounts in RON thousand</i> Customer	Total collected	Collected through offset	% of total collections
Electrica	547,824	273,813	50.0%
Hidroelectrica	55,468	49,268	88.8%
Transelectrica	31,794	31,794	100.0%
<b>Total set-offs of receivables for April, 1 – December 31, 2004</b>	<b>635,086</b>	<b>354,875</b>	<b>55.9%</b>

*Source: Details provided by the Company*

**Table 9.16: Total Set-offs of Receivables for January 1 – May 31, 2005**

<i>all amounts in RON thousand</i> Customer	Total collected	Collected through off-set	% of total collections
Electrica	296,726	99,642	33,6%
Hidroelectrica	38,235	38,235	100,0%
Transelectrica	26,252	26,252	100,0%



Total set-offs of receivables for January, 1 – May 31, 2005	361,213	164,130	45,44%
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Source: Details provided by the Company

**Table 9.17: Cash and Cash Equivalents**

<i>all amounts in RON thousand</i>	December 31, 2004	April 1, 2004
Cash on hand with banks	33,546	1,783
Deposits – guarantees for letters of credits	2,190	-
Petty cash	141	588
Other cash equivalents	15	12
<b>Total cash and cash equivalents</b>	<b>35,891</b>	<b>2,383</b>

Source: Notes to the audited financial statements as at December 31, 2004

Cash and cash equivalents include cash on hand with banks and petty cash. The amounts in foreign currency are revalued at the exchange rate communicated by the national bank as of the balance sheet date.

As at 31 December 2004 deposits of RON 2,190 thousand represent collateral guarantees for letters of credit issued in favour of external suppliers and their use is restricted.

**Table 9.18: Creditors**

<i>all amounts in RON thousand</i>	April 1, 2004	December 31, 2004	Less than 1 year	1-5 years (*)	Over 5 years
<b>Payables</b>					
<b>Total, of which:</b>	<b>590,389</b>	<b>580,215</b>	<b>299,588</b>	<b>280,627</b>	<b>-</b>
Trade payables	418,035	431,007	174,541	256,466	-
Commercial papers	93	93	93	-	-
Other payables	172,261	149,115	124,954	24,161	-

Source: Notes to the audited financial statements as at December 31, 2004

(\*) Other long-term payables as at December 31, 2004 as per notes to the audited financial statements include additional balances compared to our computation

The highest trade payables are detailed below:

**Table 9.19: Highest Trade Payables**

	December 31, 2004
SC ICM SA	256,466
SN CFR Craiova	16,397
SAEM Turceni	4,667
Alstom	2,784
Petrom București	2,103
Apele Romane	502
Tecnoarmit București	111



## TRADE PAYABLES

The ageing of trade payables as at December 31, 2004 for the Energy Division only is presented in the table below:

**Table 9.20: Trade Payables Ageing (Energy Division Only)**

<i>all amounts in RON thousand</i> Supplier	Less than 30 days	30 - 60 days	60 - 90 days	90 - 365 days	Over 365 days	Total
SC ICM SA	-	-	-	102,413	154,053	256,466
EM Rosia	6,571	14,796	12,838	-	1,138	35,342
FE București	13,275	4,840	588	-	-	18,703
SNTFM CFR Marfă Craiova	6,045	5,185	4,276	890	0	16,397
SC Hidroelectrică SA BUC.	6,069	2,204	-	-	-	8,273
Transelectrica ST Craiova	4,332	944	-	-	-	5,276
SL Motru	464	2,376	1,673	-	-	4,512
Regia Autonomă Activ Nuclear	3,016	-	-	-	-	3,016
Alstom Power Romania SRL BUC.	1,095	538	318	252	582	2,784
SC Termoserv Turceni SA	1,865	22	0	266	(0)	2,153
Petrom București	1,349	804	-	(50)	-	2,103
FE Deva	1,068	606	-	-	-	1,674
FRE TG JIU	1,604	-	-	0	0	1,604
ECM Motru	302	1,015	(4)	-	0	1,313
SC Compex.Energetic Craiova	564	483	190	-	-	1,236
SC Termoelectrică SA București	24	246	-	853	-	1,124
I.E Galați	654	17	-	301	-	972
Others	3,726	1,419	104	952	950	7,151
<b>TOTAL</b>	<b>52,020</b>	<b>35,495</b>	<b>19,983</b>	<b>105,878</b>	<b>156,723</b>	<b>370,098</b>

Source: Details provided by the Company

The balance of RON 256,466 thousand owed to the mines closing company, SC ICM SA, represents 69.3% of the total commercial debts as at 31 December 2004. This amount constitutes the historical debt accumulated by S.C. Electrocentrale Turceni S.A. and due to Compania Națională a Lignitului Oltenia for the coal supplied to it until the set up of TEC, which was divided in to SC ICM SA and Societatea Națională a Lignitului Oltenia.

Out of the total commercial debts as at 31 December 2004, 42% are older than 365 days. Among these payables older than one year, 99% (154,053) represent amounts owed to SC ICM SA.

## FIXED ASSETS SUPPLIERS

The ageing of debts related to the purchasing of fixed assets as at December 31, 2004 for the Energy Division only is presented in the table below:

**Table 9.21: Ageing of Debts Related to Purchase of Fixed Assets (Energy Division Only)**

<i>all amounts in RON thousand</i> Supplier	Less than 30 days	30 - 60 days	60 - 90 days	90 - 365 days	Over 365 days	Total
SAEM Turceni	4,810	-	-	2	(0)	4,813
SC Vulcan SA București	961	-	-	-	0	961
Energoconstrucția	755	-	-	-	(5)	750
ISPE București	381	-	-	-	85	466



COMELF SA Bistrita(I.U.T. 1)	339	-	-	-	0	339
SC Pixcom Tour-SRL Craiova	282	-	-	-	-	282
Alstom Power Romania SRL BUC.	121	-	-	-	20	140
Hidroconstrucția TG-JIU	87	-	-	-	-	87
Armit SRL București	84	-	-	-	0	84
SC CG ARO SA Cîmpulung	60	-	-	-	-	60
OSPA TG-JIU	58	-	-	-	-	58
SC Mixt Globus București	2	-	-	-	47	49
SC Polimax SRL Craiova	44	-	-	-	-	44
Intercompiuter General SA TG-J	40	-	-	-	-	40
Others	(39)	-	-	-	(3)	(43)
<b>TOTAL</b>	<b>7,984</b>	-	-	<b>2</b>	<b>144</b>	<b>8,130</b>

Source: Details provided by the Company

The negative amounts in the table represent performance guarantees for works contracted with the respective fixed assets suppliers.

**Table 9.22: Other Creditors**

<i>all amounts in RON thousand</i>	December 31, 2004
Sundry creditors	85,496
Creditors Termoelectrica	48,512
Taxes and similar charges	8,986
Salaries and social security contribution	6,121
<b>Total</b>	<b>149,115</b>

Source: Audited trial balance as at December 31, 2004

The debts to Termoelectrica consist mainly of amounts representing the loans contracted by Termoelectrica SA and taken over by TEC through the assets/liabilities transfer protocol concluded between the two entities.

**Table 9.23: Principal Installments due to Termoelectrica**

Principal	Balance as of December 31, 2004 (EUR)	Balance as of December 31, 2004 (RON thousand)
Credit KFW	10,714,148	42,496
Credit EFIBANCA	407,905	1,618
Credit BCRU	222,796	884
<b>Total</b>	<b>11,344,849</b>	<b>44,998</b>

Source: Notes to the audited financial statements as at December 31, 2004

**Table 9.24: Interest Installments due to Termoelectrica**

Interest	Balance as at December 31, 2004 (EUR)	Balance as at December 31, 2004 (RON thousand)
Credit KFW	268,899	1,066
Credit EFIBANCA	1,388	6
Credit BCRU	1,222	5



Total	271,509	1,077
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Source: Notes to the audited financial statements as at December 31, 2004

**Table 9.25: Amounts Owed to MPF**

MFP Debts	Balance as at December 31, 2004 (RON thousand)
Loan BIRD 3363	18
Loan 135 mil. USD	700
Loan 115 mil. USD	558
Loan 75 mil. USD	176
Penalties	986
<b>Total</b>	<b>2,438</b>

Source: Notes to the audited financial statements as at December 31, 2004

## CONTINGENT LIABILITIES AND COMMITMENTS

### Investment Programs:

During 2004, TEC carried out the Unit 5 rehabilitation program. This program, with a total value of USD 160,961,390 commenced in 1997 and is foreseen to end in 2006. Until January 31, 2005, an amount of RON 255,039 thousand has been invested. The total value of the investment at completion of the objective is estimated by the management at RON 390,687 thousand. The funding of the remaining necessary investment will be provided by the Company from its own funds.

Within the Jilt coalmine, a production capacity increase program is being carried out through the purchase of an excavator. The management estimates that the project will be finalized during 2007.

### Litigations:

Litigation procedures were instituted against the Company has been sued by ICM SA which requests the payment of the CET debt resulting from the restructuring of CNLO and which was taken over by ICM.

### Loans Contracted by Termoelectrica on Behalf of the Company:

During 1991 – 2002, Termoelectrica contracted 8 loans for the purchase of the fuel and for the rehabilitation of Units no. 4 and 5. Pursuant to the protocol regarding the spin off of SC Electrocentrale Turceni SA from Termoelectrica, the Company undertook to pay the future liabilities (unknown at the spin off date), representing interest, fees and foreign exchange losses related to the said loans. As at 31 December 2004, the debts related to the loans contracted by S.C. Termoelectrica S.A. on behalf and on account of the Company amounted to RON 49,134 thousand, of which RON 46,074 thousand represent amounts due to the lenders and RON 3,060 thousand represent amounts due to the Ministry of Public Finance (in 2002 and 2003, part of the debt that was not repaid by S.C. Termoelectrica S.A. was paid by the Ministry of Public Finance).

### Severance Payments:

In compliance with the collective labour contract, when an employee is discharged of duties at Company's initiative, such employee shall receive a severance payment depending on his/her employment period, as follows:

**Table 9.26: Severance Payment Entitlements**

Employment period	Number of gross salaries
1-5 years	5
5-10 years	12
10-20 years	16
20 – 25 years	20
Over 25 years	22

*Source: Extract from the collective labour contract for 2005*

No provisions for severance payments were registered and we have not proposed such adjustments, as the management does not plan any restructurings.

### ENVIRONMENTAL ISSUES

Both generation of electric power through fossil fuels burning and coal mining are polluting activities.

Through the environmental legislation compliance program and the coal mining license application, the Company committed to undertake the necessary investments required for the environmental protection and reclamation of land.

In accordance with the information provided by the Company, such investments refer to:

**Table 9.27: Investments for Compliance with Environmental Protection Regulations**

Action	Amount			Compliance deadline
	2005	2006	Total	
For the electric power generation	7,407	8,685	16,092	
<b>For the coal mining</b>	1,481	402	1,883	
Reintroduction into the agricultural circuit (27 ha)				12/31/2007
Dust collectors mounting				12/31/2006
Covering with bonnet strip against dust and noise (900m)				12/31/2008
Replacement asbestos cement coverings (1928 sqm)				12/31/2008
Green curtains at the coal warehouse				12/31/2006
Replacement asbestos cement coverings (110 sqm)				12/31/2006
Unsilt of the Tehomir waste water separator				12/31/2005
Dust collectors mounting				12/31/2006
Replacement asbestos cement coverings (700 sqm)				12/31/2008
Green curtains at the coal warehouse				12/31/2006
<b>Total expenses for environmental protection</b>	<b>8,888</b>	<b>9,087</b>	<b>17,975</b>	

*Source: Details provided by the Company*

Land reclamation is the process of improving disturbed land (soil, vegetation, water) to achieve land capability equivalent to the initial condition. The Company has undertaken this project by performing a site inventory and an environmental assessment prior to seeking funds for reclamation investments

**Table 9.28: Land Reclamation**

Determination of Surfaces (ha)	Interior Waste Dump			Exterior Waste Dump			Total
	Agricultural Surface	Forestry Surface	Returned Surface	Agricultural Surface	Forestry Surface	Returned Surface	
1.1 Quarry Jilt Sud	145	355	0	65	35	0	600
1.2 Quarry Jilt Nord	56	72	22	35	40	60	285
<b>Total</b>	<b>201</b>	<b>427</b>	<b>22</b>	<b>100</b>	<b>75</b>	<b>60</b>	<b>885</b>

For the purpose of this assessment the Company has estimated cost per hectare for two scenarios:

- Return of one agricultural hectare – 22 thousand RON/ha for 3 years
- Return of one forestry hectare – 50 thousand RON/ha for 3 years

The computation for the first scenario is based on cost estimates for works which include specific volume, average distance for transportation, consolidation work and water management (RON 8-14 thousand).

Furthermore activities to prevent land erosion will have to be performed, including fertilization and seeding of perennial and ameliorative plants (RON 8 thousand).

For the second scenario the computation is based on cost estimates for the prevention of land erosion through reforestation (RON 50 thousand).

**Table 9.29: Prevention of Land Erosion through Reforestation**

	Surfaces to be reclaimed (ha)	Price/ha (RON thousand)	Estimated cost	Total period	Years passed	Retained earnings	Increase in land value
Agricultural	301	22	6,562	18	4	1,458	6,562
Forestry	502	50	25,100	18	4	5,578	25,100
<b>Total</b>	<b>803</b>	<b>72</b>	<b>31,662</b>	<b>-</b>	<b>-</b>	<b>7,036</b>	<b>31,662</b>

For determining the environmental provision, the future value of the investment needed to return the surfaces to the agricultural and forestry circuit has been discounted over a period of 18 years (the remaining mine exploitation period estimated by the Management). The discount rate is approximately equal to the reference interest rate of the National Bank of Romania.

$$\text{Cost}/(1 + R)^n = 31,662 / 3.9960195 = \text{RON } 7,923 \text{ thousand}$$

Cost = RON 31,662 thousand

R = approximately 8% (reference interest rate of the National Bank of Romania)

n = 18 years

## EQUITY

The table below details the Company's changes in equity for the 9-month period ended December 31, 2004:

**Table 9.30: Changes in Equity**

<i>all amounts in RON thousand</i>	April 1, 2004	Increase	Decrease	December 31, 2004
Paid-in share capital	455,520	0	0	455,520
Reserves from tangible fixed assets revaluation	562,914	0	0	562,914
Legal reserves	58,518	1,391	0	59,909
Other reserves	1,036	2,026	0	3,061



Retained earnings	2,128	22,774	-3,002	21,900
Result for the year	0	786,569	-761,769	24,800
Profit Distribution	0	-24,800	0	-24,800
<b>Total equity</b>	<b>1,080,116</b>	<b>787,960</b>	<b>-764,771</b>	<b>1,103,304</b>

*Source: Statement of Changes in Equity for the 9-month period ended December 31, 2004*

In accordance with GD no. 103/2004 provisions, TEC's share capital should be RON 456,741 thousand divided in 45,674,147 shares, each with a par value of RON 10. The share capital is owned 100% by MEC. As of December 31, 2004 the Company's share capital as per its financial statements (RON 455,520 thousand) is different from the amount stated in GD no. 103/2004. This issue will be settled in the near future.

The actual share capital consists of 45,551,970 ordinary shares, each with a par value of RON 10.

Revaluation reserves are related to fixed assets and consist of a surplus as a result of a revaluation performed by Termoelectrica SA before the separation of the two entities. The revaluation reserves were taken over by TEC as part of an equity component through the separation protocol concluded between the two entities.

In accordance with the Romanian fiscal provisions, 5% of the annual profit must be transferred to the legal reserve, until it reaches 20% of the share capital. The legal reserve cannot be distributed.

## PROFIT AND LOSS ACCOUNT ANALYSIS

### Income:

During April, 1 – December 31, 2004, the Company's income can be broken down as follows:

**Table 9.31: Company Income**

<i>all amounts in RON thousand</i>	9-month period ended December 31, 2004
<b>Sales</b>	
Income from electric power production	495,156
Income from system services	17,147
Income from thermal energy production	57
Other sales	33,247
<b>Total</b>	<b>545,607</b>

*Source: Audited trial balance as at December 31, 2004*

Other sales consist of sales of merchandise, residual products and other sales of goods and services as shown in the table below.

**Table 9.32: Other Sales**

<i>all amounts in RON thousand</i>	9-month period ended December 31, 2004
Sales of merchandise	31,464
Sales of residual products	1,364
Other sales of goods and services	419
<b>Total</b>	<b>33,247</b>

*Source: Audited trial balance as at December 31, 2004*



## Electricity Sales

During the period reviewed the structure of electricity sales by consumer type is:

**Table 9.33: Electricity Sales by Customer Type**

	9-month period ended December 31, 2004		5-month period ended May 31, 2005	
	(MWh)	(%)	(MWh)	(%)
Captive consumers	3,074,400	74%	1,263,264	46%
Eligible suppliers and consumers within bilateral contracts	1,055,778	26%	1,504,968	54%
<b>Total</b>	<b>4,130,178</b>	<b>100%</b>	<b>2,768,232</b>	<b>100%</b>

Source: Details provided by the Company

**Table 9.34: Operating Profit Analysis**

<i>all amounts in RON thousand</i> Indicator	9-month period ended December 31, 2004
1. Net Turnover	545,607
2. Cost of goods sold and services rendered (3+4+5)	532,890
3. Direct production costs	488,295
4. Indirect production costs	-
5. Overheads	44,594
6. Gross profit (1-2)	12,718
7. Selling costs	-
8. Administrative expenses	12,130
9. Other operating income	38,783
10. Operating result (5-6+7+8-9)	39,371

Source: Notes to the audited financial statements as of December 31, 2004

## KEY PERFORMANCE INDICATORS

**Table 9.35: Balance Sheet Indicators**

Indicator	Calculation formula	CE Turceni December 31, 2004	Sokolovska Uhelna December 31, 2003
Inventory turnover (days)	Balance class 3/DR turnover class 3 * (9/12)*365	41	118
Raw materials turnover (days)	Balance acct 301/ DR turnover acct 301 * (9/12)*365	27	-
Spare parts turnover (days)	Balance class 3/ DR turnover class 3 * (9/12)*365	252	-
Receivables turnover (days)	Clients balance / DR turnover clients * (9/12)*365	133	58
Average collection period (days)	Clients balance / CR turnover creditor clients * (9/12)*365	130	-
Payables turnover (days)	Suppliers balance / CR turnover suppliers * (9/12)*365	183	-



Indicator	Calculation formula	CE Turceni December 31, 2004	Sokolovska Uhelna December 31, 2003
Sundry debtors turnover (days)	Sundry debtors balance / DR turnover sundry debtors * (9/12)*365	800	-
Sundry creditors turnover (days)	Sundry creditors balance / CR turnover sundry creditors * (9/12)*365	2,512	-
Weight of fixed assets in total assets	Fixed assets / Total assets	70%	77%
Liquidity	Current assets / Current liabilities	184%	291%
Solvency	Equity / Total equity and liabilities	74%	69%
Gearing	Total liabilities / Total equity and liabilities	26%	31%
Liabilities to equity ratio	Total liabilities / Total equity	34%	45%

Source: Deloitte computation

**Table 9.36: Profit and loss account indicators**

Indicator	Calculation formula	CE Turceni December 31, 2004	Sokolovska Uhelna December 31, 2003
Gross margin	Gross margin / Turnover	22.37%	7.46%
Gross margin/MWh delivered (RON/MWh)	Gross margin / Delivered power quantity	29.55	144.3
Gross profit/MWh delivered (RON/MWh)	Gross profit / Delivered power quantity	9.20	21.07
Net profit /MWh delivered (RON/MWh)	Net profit / Delivered power quantity	6	20.7
Economic return	Gross profit / Permanent capital	2.24%	4.66%
Return On Assets	Gross profit / Total assets	1.99%	3.59%
Return On Equity	Net profit / Equity	1.75%	5.06%
Return On Sales	Net profit / Turnover	4.55%	7.46%

Source: Deloitte computation



### 9.3. Management Reporting of TEC as of December 31, 2004

**Table 9.37: Management Reporting – Cost Structure for April 1 – December 31, 2004 (in ROL)**

	April, 1- December 31, 2004		
	Energy	Mining	Total
1. Raw materials, basic and auxiliary materials, of which	15,022,547	547,554	15,570,101
-oils and chemicals	9,919,729		9,919,729
-wear of inventories	5,102,818	547,554	5,650,372
2. Non-technical fuel	21,334,477	19,624,891	40,959,368
3. Technological water from outside and non-technological water	38,632,342	614,356	39,246,698
4. Energy from outside	-34,530,104	291,027,296	256,497,192
4.1 Energy from outside from grid	95,660,016	160,837,176	256,497,192
4.2 Energy for coal mining	-130,190,120	130,190,120	
7. Meal tickets	13,444,232	14,523,761	27,967,993
8. Depreciation	475,130,671	137,225,208	612,355,879
9. Repairment expenses, of which:	508,606,963	424,899,183	933,506,146
9.1. Third party repairment services	337,725,604	123,603,599	461,329,203
a. Expenses with major inspections, of which:	50,769,422	0	50,769,422
-materials and spare parts	6,976,740		6,976,740
-repairs	43,792,682		43,792,682
b. Expenses with annual repairs, of which:	286,956,182	123,603,599	410,559,781
-repairs	286,956,182	123,603,599	410,559,781
c. Rehabilitation expenses, of which:	0	0	0
-materials and spare parts			0
-repairs			0
9.2. Annual internal repairs of equipment	97,671,000	0	97,671,000
-materials and spare parts	97,671,000		97,671,000
9.3. Maintenance	73,210,359	301,295,584	374,505,943
-materials and spare parts	73,210,359	301,295,584	374,505,943
10. Insurance premiums	1,342,734		1,342,734
10.b Surveys and research	408,700		408,700
10 Commissions and fees	2,050,000		2,050,000
11. Protocol and advertising	671,571		671,571
12. Post and telecommunications	1,884,289	1,183,951	3,068,240
13. Expenses with banking services and similar	7,692,247	1,168,270	8,860,517
14. Expenses with transportation of goods	3,121,982	53,165,508	56,287,490
15. Other royalties and rents		40,105,955	40,105,955
16. Other services rendered by third parties	15,702,529	118,797,197	134,499,726
17. Technological fuel, of which:	3,449,255,782	0	3,449,255,782
-coal	2,570,167,372		2,570,167,372
-coal transportation	617,422,304		617,422,304
-heavy fuel oil	33,603,738		33,603,738
-heavy fuel oil transportation	1,503,528		1,503,528
-natural gas	226,558,840		226,558,840
<b>A. TOTAL MATERIAL COSTS</b>	<b>4,519,770,962</b>	<b>1,102,883,130</b>	<b>5,622,654,092</b>
18. Salary expenses	217,547,120	383,247,160	600,794,280
19. Social security contributions	47,750,280	100,957,790	148,708,070
20. Health fund	15,226,119	27,295,223	42,521,342
21. Unemployment fund	6,448,779	11,697,953	18,146,732
22. Special fund for disabled	1,656,800	2,688,000	4,344,800
<b>B. TOTAL PERSONNEL COSTS</b>	<b>288,629,098</b>	<b>525,886,126</b>	<b>814,515,224</b>
23. Other taxes, duties and similar charges	44,658,735	10,118,564	54,777,299
24. Travel expense	1,806,538	504,948	2,311,486
25. Other social expenses (meals, etc.)		64,676,866	64,676,866
26. Expenses with social and cultural activities (energy)	5,434,915	3,709,319	9,144,234
5. Expenses with energy transportation	357,991,509	25,474,329	383,465,838
6. Energy purchased from third parties	309,083,637		309,083,637
27. Other operating expenses	68,115,626	31,474,752	99,590,378
27 Provisions	32,750,892	34,002,725	66,753,617
28. Financial expenses	33,363,178	233,987	33,597,165
<b>C. TOTAL OTHER EXPENSES</b>	<b>853,205,030</b>	<b>170,195,490</b>	<b>1,023,400,520</b>
<b>TOTAL EXPENSES (A+B+C), of which:</b>	<b>5,661,605,090</b>	<b>1,798,964,746</b>	<b>7,460,569,836</b>
a. Expenditures with electricity, of which:	5,661,047,658	0	5,661,047,658
-expenses with energy effectively supplied	4,822,500,957		4,822,500,957
-expenses electricity delivered on spot market	309,083,637		309,083,637
-expenses transmission of electricity	357,991,509		357,991,509
-system services	171,471,555		171,471,555
b. Expenses with thermal energy	557,432		557,432
c. Expenses with coal extraction and preparation		1,751,873,089	1,751,873,089
30. Energy sold-MWh	3,803,423		3,803,423
31. Cost of supplied electricity-LEI/Mwh	1,259,326		1,259,326
32. Cost of supplied electricity-\$/Mwh	38.59		38.59
33. Delivery price-LEI/Mwh	1,301,377		1,301,377
34. Electricity delivery price-\$/Mwh	39.87		39.87
<b>III. TOTAL REVENUES</b>	<b>6,104,717,765</b>	<b>1,760,972,255</b>	<b>7,865,690,020</b>
a. Turnover, of which:	5,451,922,915	4,143,229	5,456,066,144
-revenues from electricity sales	4,949,687,060	2,195,218	4,951,882,278
-revenues from heat sales	557,432		557,432
-revenues from system services	171,471,555		171,471,555
-revenues from energy sales on the spot market	309,083,637		309,083,637
-other revenues	21,123,231	1,948,011	23,071,242
b. Other revenues (energy transportation, interest and penalties) etc.	652,794,850	2,647,640	655,442,490
-revenues from energy transportation	361,734,774		361,734,774
-other revenues	291,060,076	2,647,640	293,707,716
c. Revenues from coal extraction and preparation		1,754,181,386	1,754,181,386
<b>IV. GROSS PROFIT</b>	<b>443,112,675</b>	<b>-37,992,491</b>	<b>405,120,184</b>
<b>V. INCOME TAX</b>	<b>131,819,765</b>		<b>131,819,765</b>
<b>VI. NET PROFIT</b>	<b>311,292,910</b>		<b>273,300,419</b>
Exchange Rate (LEI/\$)	32,636.56		





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## 10.0. LEGAL ISSUES

### 10.1. Legal Status of Turceni Energy Complex

#### LEGAL FORM

The reorganization of the companies undergoing privatization is governed by the Law No. 137/2002, as amended, (the “**Privatization Law**”), by the Government Ordinance No. 88/1997 (the “**Privatization Ordinance**”) and by the Methodological Norms to the Privatization Law and to Privatization Ordinance (the “**Norms**”), collectively (the “**Privatization Legislation**”) completed accordingly with the Company Law 31/1990 as further amended.

The reorganization of companies which are not undergoing privatization (including reorganization of the state-owned companies) is governed by the general rules of the Company Law (the Law 31/1990). According to the Company Law the constitutive acts of the newly set up companies must be approved by the General Assembly of Shareholders (“**GAS**”) of the companies, which will cease to exist. Further, the new company will be registered with the Commercial Registry and the constitutive act will be published in the *Official Gazette*.

Prior to the incorporation of the Company, Termoelectrica was the sole shareholder of Electrocentrale Turceni. According to the Government Decision 103/2004, the Ministry of Economy and Commerce became the sole shareholder of the Company.

#### COMPANY’S HEADQUARTERS

Pursuant to the certificate of registration, the Company’s registered headquarters are located at 1, Uzinei Street, Turceni, Gorj County.

#### REGISTRATION CERTIFICATE

The certificate of registration (series B No. 0335926) was issued by the Commercial Registry held by the Gorj Courtl (*Oficiul Registrului Comertului de pe langa Tribunalul Gorj*) on 5 May 2004. The full legal name of the Company is “*Societatea Comerciala Complexul Energetic Turceni S.A.*” The sole registration code (*codul unic de inregistrare*) is 16302447 and the order number in the Commercial Registry is J18/257 of 1 April 2004 The Company has the fiscal category R being a VAT payer.

#### BUSINESS OBJECTS

According to the Registration Certificate the Company has two core business profiles:

- CAEN 4011 – The production of electricity and heat by use of lignite as a fuel; and
- CAEN 1020 – The extraction and preparation of lignite.

The Company’s secondary business profile comprises more than 100 activities.

#### WORKING UNITS

GAS Resolution No. 4 of 13 August 2004 had set up three working units and the Statute has been amended accordingly.

The amendments to the Statute regarding setting up of the three working units have been published with the *Official Gazette*, Part IV, of 6 October 2004.



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The Company has the following working units: Jilt Nord mining exploitation is located in Bradet, Matasari Commune, Gorj County and is authorized for CAEN 1020 – Extraction and preparation of low grade coal.

- (i) Jilt Sud mining exploitation is located in Matasari, Matasari Commune, Gorj County and is authorized for CAEN 1020 – Extraction and preparation of low-grade coal.
- (ii) Dragotesti (Tehomir) (mine is located in Dragotesti, Dragotesti commune, county Gorj and is authorized for CAEN 1020 – Extraction and preparation of low-grade or coal.

## **10.2. The By-Law**

### **THE GENERAL ASSEMBLY OF SHAREHOLDERS (GAS)**

The GAS of the Company is the main body that governs the Company and deciding upon issues concerning the Company’s activities and economic policy.

#### **Types of Meetings:**

As the body of owners, the GAS passes its resolutions during formal meetings. The Company Law provides for different types of meetings – i.e., ordinary GAS and extraordinary GAS. The ordinary GAS is required by law to be held at least once a year and is generally convened by the Directors. Extraordinary GAS is generally convened by the directors, and may be also convened by the directors at the request of the shareholders or the internal auditors , if any.

#### **Authority:**

The Company Law clearly distinguishes between the authorities of the ordinary GAS and those of the extraordinary GAS and this is also applies to companies for establishing the authority or powers of the GAS in their constitutive documents. The Statute is drafted in the same manner, by clearly dividing the authority of the two types of GAS.

#### **Authority of the Ordinary GAS:**

In relation to some authorizations, the ordinary GAS can pass resolutions only with the prior approval of the authority, which appointed the representatives of the State in the GAS (*i.e.* the Ministry of Economy and Commerce). The prior approval shall have the form of a special proxy.

- (iii) For details on present authorization of the, the ordinary GAS please see the Statute, Art. 15.(3) and authorizations of the extraordinary GAS – the Statute, Art. 15(5), After privatization most likely there will be adequate changes reflected in the Statute.

#### **Quorum and Voting Requirements**

##### ***The Ordinary GAS:***

The ordinary GAS is deemed validly constituted if upon the first calling the attending shareholders or the shareholders who are represented hold at least one half (1/2) of the share capital. A validly constituted ordinary GAS can pass valid resolutions by the vote of the absolute majority (i.e., 50% + 1 share) of the share capital represented in the GAS.



The Statute is silent in relation to the quorum and the voting requirements for the second calling. Thus, it shall apply the relevant provisions of the Company Law which stipulates that in case the ordinary GAS cannot be held due to the failure to have a quorum, the GAS that is held following a second calling shall debate and decide the issues included on the agenda of the first GAS irrespective of the number of the attending shareholders present to the second calling and irrespective of the number of shares of those present, with the simple majority of the share capital represented in the GAS.

All the above mentioned-provisions of the Statute are in compliance with the Company Law.

### ***The Extraordinary GAS:***

For the validity of the resolutions of the extraordinary GAS, it is necessary: upon the first calling, the attending shareholders represent at least three quarters (3/4) of the share capital, and a validly constituted Extraordinary GAS can pass binding resolutions if shareholders representing half (1/2) of the share capital at such meeting vote in favour thereof.

In the event the quorum is not met upon the first calling, then, upon the second calling, the attending shareholders must represent half (1/2) of the share capital, and the resolutions can be made with the vote of the number of shareholders representing one third (1/3) of the share capital.

### **State's Interests:**

As long as the State is the sole shareholder in the Company, its interests in the GAS shall be represented by the Ministry of Economy and Commerce through OPSPI. The State's representatives in the GAS are appointed and revoked by order of the Minister of Economy and Commerce. By Order No. 3024 of 8 March 2004 of the Minister of Economy and Commerce, the following persons are currently representing the State's interests in the GAS:

**Table 10.1: Representatives of the State's Interests**

<b>Name and Surname</b>	<b>Order of Minister</b>
Mr Carla Fillip	No. 3024 of 8 March 2004
Mr Olean Ion	No. 3024 of 8 March 2004
Mr Bacilli Stefan	No. 3024 of 8 March 2004

### **Calling the GAS:**

The GAS may be convened by the Chairman, by one of the Board members, based on a power of attorney granted by the Chairman or upon the written request of the sole shareholder, whenever requested in accordance with the legal provisions and of the Statute, provided notice has been given at least 15 days before the date of the GAS. The extraordinary GAS may be also convened by the internal auditors, when applicable.

The Statute provides that the ordinary GAS is held at least once a year within no more than (3) months after the close of the fiscal year for the purpose of examining the financial statements, as well as for the establishing the business plan and the budget for the current year. The Company Law establishes a term of maximum four (4) months following the close of the fiscal year in which the ordinary GAS must be held; the Statute provides an even stricter requirement, by establishing a shorter term of three (3) months in which the ordinary GAS must be held.



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The calling notice must specify the place and the date of the GAS, as well as the agenda of the GAS by explicitly mentioning all the issues that will be subject to debate. In case the agenda includes proposals regarding the modification of the Statute, the calling notice must include the entire text of the proposed amendments. The GAS takes place at the Company's registered headquarters, but may be held at any other location mentioned in the calling notice.

The Statute does not provide the obligation of publishing the calling in the *Official Gazette* of Romania and in one of the wide circulated newspapers from the closest locality (Turceni does not have a local newspaper).

### **Exercise of the Voting Rights in the GAS:**

As a general rule, all resolutions of the GAS are made by open vote. However, a secret vote is mandatory for electing and revoking members of the Board of Directors and the internal auditors, and also for making resolutions regarding the Directors' liability. The person who presides over the GAS meeting or one of the members of the GAS meeting may propose that the vote be secret in other cases, except those in which the open vote is compulsory.

The resolutions of the GAS made in accordance with the law and the Statute is mandatory even for the absent shareholders or those who voted against. The shareholders who disagree with the resolutions made by the GAS with respect to changing the business object, the re-location of the headquarters or the modification of the corporate form are entitled to withdraw from the Company and to recover the value of the shares they own, in accordance with the law.

### **Formalities to be observed during the GAS:**

The GAS is chaired by the Chairman of the Board of Directors and, in his absence, by the person replacing the Chairman. The Chairman designates from the Company's shareholders, one individual for a secretary position to verify the fulfilment of the formalities required by law for carrying out the GAS and for drafting the minutes thereof.

According to the Statute, the minutes of the GAS meetings shall be signed by the representatives of the State in the GAS, (the representatives of the Ministry of Economy and Commerce) and the secretary who drafted them. According to the Company Law – Article 131 (1) – the minutes must be signed by the president of the GAS (the Chairman of the Board of Directors or the person who replaces the Chairman of the Board of Directors) and by the secretary of the meeting.

The minutes of the GAS must be recorded in a special sealed and signed register held by the Board of Directors. The register shall include documents for calling of the meeting, the attendance lists, as well as the special proxies of the representatives empowered by the Ministry of Economy and Commerce. .

## **THE BOARD OF DIRECTORS**

### **General:**

The Company is managed on a daily by the Board of Directors, which includes five members. The Board may adopt all necessary resolutions concerning the management of the Company, excluding or those expressly reserved for the shareholders and in compliance with the restrictions provided by the law, the Statute or the resolutions of the GAS.



### Appointment of the Board's Members:

The members of the Board are appointed for a period of four years by order of the Minister of Economy and Commerce and in this capacity are receiving a monthly remuneration. The directors (the “**Directors**” and each, a “**Director**”) are appointed as follows: the Minister issues an order nominating the members of the Board to be appointed by the State’s representatives at the GAS meeting; then the nominated persons in the Minister’s order are appointed through a GAS resolution. The first members of the TEC Board were appointed in compliance with these provisions. In the event of a vacancy on the Board, the GAS will appoint a new Director who will serve the remaining term of his predecessors’ mandate.

The current structure of the Board comprises the following members:

**Table 10.2: Board of Directors**

No	Name	Ordinary GAS Resolution	Registered with the Commercial Registry	Position in the Board
1	Mr Constantin Marin	No. 1 of 25 March 2004	Yes	Chairman and General Manager
2	Mr Nicolae Turdean	No. 1 of 25 March 2004	Yes	Member
3	Mrs Luminita Lupului	No. 1 of 25 March 2004	Yes	Member
4	Mr Teofil Sevan	No. 1 of 25 March 2004	Yes	Member
5	Mrs Cristiana Chiriac	No. 1 of 25 March 2004	Yes	Member

### Directors’ Remuneration:

Each Director’s remuneration is 20% of the General Manager’s gross salary.

### Directors’ Bond:

Under the Romanian law, each Director is required to post a statutory bond before taking up his or her appointment, such bond consisting of a deposit in cash or shares with the Company’s treasury or in a bank account at the Company’s disposal. This bond amounts to the nominal value of 10 shares or twice the monthly remuneration of the Director.

### Registration of Specimen Signatures and Legal Representation:

According to the Company Law, the Directors who are empowered to represent the Company to third parties must register their specimen signatures with the Commercial Registry, to ensure the enforceability of their signature against third parties. Such registration has been performed for current members of the Board of Directors. The Statute provides that in relations to third parties the Company is represented by the General Manager empowered by the Board of Directors.

The right to represent the Company is limited to the powers granted by the Board of Directors. The General Manager is also the Chairman of the Board of Directors and as such is appointed by the GAS.



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### **Authorizations:**

As mentioned above, the Board is responsible for the daily management of the Company and has the broadest authority to act on behalf of the Company in all cases that are within its business profile s, except for the authority exclusively granted to the GAS. The Statute Art. 19 (15) provides a full list of the Board's powers.

### **Quorum and Voting Requirements:**

The resolutions of the Board shall be valid if they are made in the presence of at least one half (1/2) of its members (i.e. three members) and if they are made by a vote representing the simple majority of the attending members.

### **Formalities to be Observed with Respect to Board Meetings:**

The Board holds its meetings at the Company's headquarters on a monthly basis or whenever necessary, when convened by its Chairman or by one third of its members. The Board is chaired by its Chairman; when the Chairman is absent, the Board meeting is chaired by a member of the Board who has been granted a mandate by the Chairman. The debates and resolutions of the Board take place in accordance with the agenda established and notified by the Chairman within no less than seven days prior to the date of the meeting. The minutes of the meeting shall be recorded and maintained in a registry, which is sealed and signed by the Chairman of the Board.

The Chairman must appoint a secretary for the Board meeting (either a member or a non-member of the Board). The minutes shall be signed by all the attending members of the Board and the secretary. The resolution of the Board shall be drafted based on the minutes and shall be signed by the Chairman.

Upon the shareholders', the external auditors' and the internal auditors' request the Chairman must make available to them all the Company's corporate documents.

### **Directors' Liability:**

The members of the Board are held responsible to the Company, individually or jointly, as the case may be, for damages arising from criminal offences or breaches of the legal provisions, for infringements of the Statute or for negligence in relation to the administration of the Company. In such circumstances, they may be revoked from their position by resolution of the GAS.

## **THE GENERAL MANAGER**

### **Overview:**

The executive management of the Company is carried out by the General Manager.

### **Appointment:**

The Statute provides that the General Manager is a member of the Board. According to the Company Law (Article 140 (2)), only the Chairman may also be the General Manager. The current General Manager is Mr Constantin Marin, the Chairman of the Board. By Order No. 3023/2004, issued by the Minister of Economy and Commerce, Mr Marin Constantin was appointed as the first Chairman of the Board. A GAS resolution approved the remuneration of the General Manager



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### **General Manager's Remuneration:**

According to the GAS resolution No. 6 of 1 October 2004 the General Manager's gross salary is of ROL 54,993,170 ROL. The gross salary comprises of the basic salary and benefits.

### **Authorizations:**

The General Manager of the Company represents the Company to third parties. The Statute establishes the main powers of the General Manager.

### **Dealings with Third Parties:**

The Company is represented to third parties by the General Manager, based on and within the limits of the powers granted by the Board.

### **Registration with the Commercial Registry:**

Although Order No. 3024/2004 has been filed with the Commercial Registry, the Resolution does not specify that the general manager is the legal representative of the Company. The first general manager is mentioned only as Chairman of the Board of Directors.

### **THE MANAGEMENT COMMITTEE**

According to the Statute, the Board may delegate some of its powers to a Management Committee. This implies that it is not mandatory for the Company to have a Management Committee. According to the Management Team as of the date of this Report, the Company does not have a Management Committee.

### **EXECUTIVE OFFICERS**

The executive officers *i*) and the managers of the branches (the Company does not currently have any branches) are appointed and coordinated by the General Manager; they are employees of the Company, they carry out the operations of the Company and are liable to the Company for the fulfilment of their duties, under the same conditions as the members of the Board. The duties of the executive officers are established in the Statute of the Company. According to the Company Law the executive officers cannot be members of the Board, except for the Chairman.

### **10.3. Listing of Shareholders, Register of Shares**

The initial share capital of the Company was of ROL 4,567,414,652,000 divided into 45,674,147 registered (nominative) shares, with a nominal value of ROL 100,000, each. The Company's share capital was amassed by the takeover of the share capital of Electrocentrale Turceni, a subsidiary of Termoelectrica S.A., and a part of CNLO's patrimony, related to Jilt mining exploitation and Dragotesti mine, according to the balance sheet as of 31 December 2003.

According to the Government Decision 103/2004 (Article 12(1)), the transfer of the assets and liabilities related to the share capital had to be carried out through a handover protocol that should have been entered into among the involved parties within 60 days as of the coming into force of the Government Decision 103/2004. The handover protocol between CNLO and the Company was concluded on 16 June 2004.

According to Article 13 of the Government Decision No. 103/2004, the share capital of the Company is wholly owned by the State as a sole shareholder, represented by the Ministry of Economy and Commerce.



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Also, Article 7(3) of the Statute states that the rights resulting from the ownership over Company shares are exercised by the Ministry of Economy and Commerce.

#### **PROSPECTIVE INCREASE OF SHARE CAPITAL**

According to the management of TEC, the amount of the assets transferred from CNLO to the Company exceeds the amount of the related liabilities. The balance is of ROL 695,205,557,262.50. Therefore it appears necessary to increase the share capital and to issue new shares.

#### **SHARES**

##### **General Information:**

The Company shares are registered, issued in dematerialised form. According to the Statute the evidence of shares and shareholders should be registered in a special register, numbered, signed and stamped by the Chairman of the Board of Directors. This register should be held at the Company's headquarters under the supervision of the Secretary of the Board of Directors. As of 31.12.2004, the Company does not have a shareholders register.

##### **Face Value of the Company Shares:**

The current face (nominal) value of Company shares is ROL 100,000, each, according to the Statute.

##### **Company's Listing on a Stock Exchange:**

The Statute does not provide that the Company shares may be listed on the stock exchange and traded on such regulated markets but, in the absence of an express prohibition, the shares may be listed on the stock exchange and traded on such regulated markets in accordance with the applicable securities legislation provided that there is a prior approval of the extraordinary GAS.

##### **Share Transfer Related Matters:**

The Company shares are freely transferable with the observance of the Privatization Legislation and of the Company Law. The shares are indivisible with respect to the Company, which acknowledges the existence of a single owner for each share. The transfer of the ownership over the Company shares is conducted through a declaration in the shareholders' register signed by the seller and the purchaser or by their proxies. The ownership over the Company shares may be also transferred by a notarised share sale-purchase agreement followed by the registration in the Company's shareholders register.

##### **Company's Right to Acquire its Own Shares:**

According to the Company Law, it is possible for a company to acquire its own shares, under certain conditions.

##### **Employees' Rights Over Company Shares:**

According to the Statute, the ordinary GAS has the power to decide upon the shareholders' and employees' right of first refusal related to the transfer of Company shares and to approve the limits and the conditions of the share transfers to the employees of the Company. There is no GAS resolution yet with respect to this issue. Also, the collective labour bargaining agreements applicable to the Company contain no such employees' rights over the Company shares.



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## SHAREHOLDING STRUCTURE

According to the Statute, the share capital of the Company is wholly owned by the State, as the sole shareholder. The State's rights as a shareholder are exercised by the Ministry of Economy and Commerce through OPSPI. According to the Company Law the shareholders' register is the document that indicates the shareholding structure and all the changes in the shareholding structure. Under Romanian law, it is not mandatory for the transfers of shares in joint-stock companies, such as the Company, to be registered with the Commercial Registry. Therefore, the evidence in the Commercial Registry may sometimes be different from that in the shareholders' register. In order to determine the actual shareholding structure, one should refer to the Company's shareholders' register.

### 10.4. Ownership Rights Over Fixed Assets

#### OWNED IMMOVABLE PROPERTY

##### Relevant Legislation:

In general, the relevant legal regime governing ownership and/or rights of use in respect of immovable properties is set forth in (1) the Constitution of Romania (2) the Romanian Civil Code, (3) the Land Law, (4) the Land's Transfer Law, (5) the Public Domain Law; (6) the Expropriation Law and (7) the Concession Law

##### Title to Land:

##### *Overview of Legislative Framework*

Romanian incorporated companies usually acquire ownership rights over the land they use during the course of their business under sale-purchase agreements. A sale-purchase agreement is a title, which indicates their ownership rights over the respective lands. In the case of state-owned companies, such as the Company, ownership rights over the land it uses are indicated usually by the ownership certificates ("Land Ownership Certificates"), issued pursuant to the provisions of (and observing the procedure established under) the **Government Decision No. 834/1991** regarding the establishing and the evaluation of the lands owned by the state-owned companies, as amended.

Entities, such as the Turceni Energy Complex, are therefore obliged to obtain Land Ownership Certificates in order to prove their ownership rights over the land that they hold. Jilt mining exploitation acquired title over certain land by sale-purchase agreements. Yet, for certain land the Complex concluded some so called civil conventions, which have not transferred the ownership. The enforceability of rights over immovable property against third parties is accomplished through land registry offices held by the cadastral and publicity of immovable property offices (the "**Cadastral Offices**"). The Land Registry Office maintains land books (the "**Land Book**") where each piece of immovable property is identified and registered. Land Book is kept in the name of each piece of immovable property and not by the owner. Failure to register makes the title to the land unenforceable against third parties.

##### *Land Owned by the Company. Registrations with the Land Book:*

The Complex was set up by a merger between Electrocentrale Turceni S.A. and a part of CNLO's patrimony. Therefore, the evidence of the parcels of land is kept separately: (i) the land owned by Electrocentrale Turceni (Turceni plant), (ii) the land owned/administrated by Jilt mining exploitation and (iii) the land owned by the Dragotesti mine.



(i) The land of Electrocentrale Turceni

According to the TEC management Turceni plant owned 43 parcels of land having a total area of 8,383,934.7782 square metres (m<sup>2</sup>) having a book value of ROL 119,661,462,659.53. Pursuant to the statement made by the TEC management the plant has a Land Ownership Certificate for each of the 43 parcels of land.

(ii) The land from Jilt mining exploitation

Jilt mining exploitation's land owned or administrated by the Company is comprised of 18,442,182 m<sup>2</sup> total area. The status of the land from Jilt mining exploitation is described below.

(a) For 986,081.445 m<sup>2</sup>, the Jilt mines hold four Land Ownership Certificates (series M03, numbers 7730, 7731, 7732 and 7733) obtained by the former CNLO. The certificates were issued on 12 August 2002 by the Ministry of Industry and Resources (currently the Ministry of Economy and Commerce) and the parcels were registered with the Land Book.

(b) For 2,685,591 m<sup>2</sup>, CNLO concluded notarised sale-purchase agreements. The total book value of these parcels of land is ROL 9,779,257,355.

(c) For a surface of 772,242 m<sup>2</sup> CNLO concluded with the owners civil conventions (*conventiile civile*). The book value of these parcels is ROL 2,812,031,266.

(d) The Company administrates an area of 13,998,268 m<sup>2</sup>. Pursuant to the management the Company intends to obtain Land Ownership Certificates for an area of 330,000 m<sup>2</sup>. For the rest of the parcels of land the free of charges transfer to the local communities is expected based on economic criteria (these parcels of land doesn't have any economic significance to the Company).

(iii) The land from Dragotești mine

According to the received information Dragotesti mine comprises land area of 343,274 m<sup>2</sup>. Pursuant to the management of TEC the book value of this land area is ROL 333,161,070. For some parcels there sale-purchase agreements were concluded.

### ***Land Included in the Share Capital***

Under the Romanian law, the Company is required to increase its share capital with the value of the land for which it has obtained Land Ownership Certificates. As the land is considered as contribution in kind of the Romanian State to the share capital of the Company, the newly issued shares are to be allotted to the Romanian State. According to the received information the Complex has not incorporated in the share capital the value of land that it owns. According to the Company Law the companies whose land is included into the share capital have to conclude the constitutive act in a notarised form.

Share capital increase with the value of land owned by the Company

*The procedure for obtaining the Land Ownership Certificates for the Company's land (under the Privatization Law)*

Pursuant to Article 12(1) of the Privatization Law, companies undergoing privatization, such as the Company, were obliged to drawn up and submit relevant documentation for obtaining certificates attesting to their ownership right over certain parcels of land they use (the "**Land Ownership Certificates**") within 60 days after the enforcement of the Privatization Law (*i.e.* by 27 August 2002).

The documents should have been submitted to the institution for which the Privatization Law vests the power to issue Land Ownership Certificates, which, in the case of the Company, Electrocentrale Turceni, CNLO and Termoelectrica S.A. is the Ministry of Economy and Commerce . Under the Privatization Law, the Ministry of Economy and Commerce has the obligation to issue Land Ownership Certificates within 15 days following the Company's submission of all relevant documentation. It also has the



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obligation to submit a copy of the certificate to OPSPI within five days following the date on which any such certificates are issued.

Once issued, the directors must register the share capital increase with the Commercial Registry within 30 days following the issue of the respective Certificates. The passing of a resolution of the GAS approving the increase, and the execution of an additional act to the constitutive act reflecting such increase, should be carried out within the 30-day period mentioned above.

The incorporation of the land value for which Land Ownership Certificates have been/will be obtained must be carried out in accordance with the general rules regarding share capital increases set forth under the Company Law, and in accordance with the special provisions of the Privatization Law

According to the Privatization Law, all companies, irrespective of the shareholding structure, which was not presented with the Land Ownership Certificate, shall submit the required documentation for that purpose to the authority competent to release such Land Ownership Certificate. The competent authority shall issue the Land Ownership Certificate within 15 days after the filing of the complete documentation and shall, within five days after the issue, submit a copy of the Land Ownership Certificate to the IPI

The directors of the companies have the obligation to register the share capital increase with the relevant commercial registry within 30 days from the release of the Land Ownership Certificate. In the event that the directors do not apply for such registration within the prescribed period, the relevant commercial registry shall register the increase at the request of the IPI. In the event that the release of the Land Ownership Certificate was not followed by an appropriate increase prior to the privatization, by an appropriate increase, or if the Land Ownership Certificate is released after privatization, the share capital shall be increased by operation of law with the equivalent value of the land, which shall be deemed to be a contribution in kind of the State or of the competent local authority, as the case may be, in consideration for which the company shall issue additional shares, which shall be distributed by operation of law to the IPI.

### ***The Corporate Procedure for Increase of Share Capital***

By derogation from the provisions of the Company Law, the share capital increase shall be carried out in accordance with the relevant provisions of the Privatization Legislation.

### ***Company's land and Land Ownership Certificates***

Pursuant to the statement from the management of TEC , the land for which the Complex obtained Land Ownership Certificates was not included into the share capital..

### **Social Assets:**

By Government Decision No.1562/2003 the transfer of the social assets of Electrocentrale Turceni was approved free of charge, to the public domain of the Turceni Commune, Gorj County, for the administration by the Local Council. According to the management of TEC the book value of these assets was ROL 24,907,699,697. The total amount of the monthly depreciation was valued at ROL 63,678,267. A handover protocol dated 18 February 2004 was signed between Electrocentrale Turceni and the Local Council of Turceni Commune. According to the Government Decision No. 1562/2003 Electrocentrale Turceni should have decreased the share capital with the value of the social assets.

### **Other Immovable Property**

Recently, the Government passed the Government Emergency Ordinance No.130 of December 9, 2004 regarding certain measures for the sale of the dwellings owned by the companies, national



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companies and national corporations which carry out their activity in the energy, oil, natural gas, mineral resources, and defence sectors, as well as by other companies subordinated to the Ministry of Economy and Commerce, to the lessees or retired persons with the last job at the respective companies (the “Ordinance 130/2004”).

According to the Ordinance 130/2004, the lessees and the retired persons with the last job at the above-mentioned companies have the right to acquire the dwellings by concluding a sale-purchase agreement with the respective companies, in their capacity as owners. The Ordinance 130/2004 establishes a term (31 December 2006) until the sale-purchase agreements may be concluded. Pursuant to the TEC management statement, the Complex owned 60 dwellings located in Block 60, and 15 dwellings located in Block G7, both located in Turceni. The aggregate amount of the dwellings owned by the Complex is ROL 1,327,568,220.

#### **PUBLIC DOMAIN ASSETS HELD BY THE COMPANY**

As of the date hereof, no list or any other evidence of public domain assets used by the Complex is available.

#### **Intellectual Property**

##### *Overview*

The protection of patents in Romania is currently regulated by Law No. 64 of 1991 (the “**Patents Law**”). Trademark protection is regulated in Romania by the Law No. 84 of 1998 (the “**Trademarks Law**”), and by the Government Decision No. 833 of 1998 (the “**Trademarks Regulations**”). In addition, Law No. 26 of 1990 as subsequently republished and amended (the “**Commercial Registry Law**”) states in Article 21 that all company’s patents, trademarks, trade names and emblems must be registered with the Commercial Registry.

##### *Patents*

**Legal Background:** The rights regarding inventions are recognized and protected in Romania by the grant of a patent after completing and filing a patent application with the State Office for Inventions and Trademarks (“**OSIM**”). The patent confers to its owner an exclusive right of exploitation for a limited period of time (i.e. 20 years from the date of the national filing).

##### *Trademarks*

**Legal background:** The right over a trademark is acknowledged and protected only after the registration proceedings with OSIM have been successfully completed. The proceedings are designed to verify whether the proposed trademark meets all legal requirements. The validity period of the registration certificate issued by OSIM is 10 years, with the possibility to renew for an unlimited number of times. According to the Trademarks Law, the owner of a trademark has the exclusive right to prohibit the unauthorized use of the trademark by third parties.

**Trademarks owned by the Company:** No trademark has been registered with OSIM.



## 10.5. Licenses

### GENERAL ASPECTS

According to Article 15(2) of the Electricity Law and to Article 8 of the Licensing Regulation, the licence is necessary for: (i) commercial operation of electricity or co-generated electricity and heat production capacities (production); (ii) commercial operation of electricity transportation capacities; (iii) commercial operation of electricity distribution capacities; (iv) the activity of the electricity market operator; (v) supply of ancillary system services; (vi) supply of electricity; and (vii) supply of technological system services.

The licences granted for supply activities are valid up to eight years, and the licences granted for the other types of activities are valid up to 25 years. Turceni TPP held a 30-year authorization from the electricity regulator (ANRE **Authorization No. 184**) for the operation of 1,650MWe electricity and 68.64 MWt heat cogeneration conferred on April 17, 2003. Turceni TPP also held an 8-year electricity supply license (ANRE License No. 556) and a 25-year electricity generation license both issued by ANRE on March 6, 2003.

The electricity regulator has recently canceled these two licenses and replacement licenses in the name of the newly created Turceni Energy Complex were issued. Thus, Turceni Energy Complex has been conferred **Power Generation License No. 602** and **Power Supply License No. 603** on April 23, 2004. ANRE issued Decisions 112 and 113, respectively, conferring these licenses to Turceni Energy Complex.

### PRODUCTION LICENCE

License No. 602 of April 23, 2004 issued by ANRE for the Company for the production of electricity is valid for 25 years starting with the date of issue. This licence replaced the electricity production licence No. 555 of March 6, 2003 issued to Electrocentrale Turceni S.A. in order to reflect its reorganization as Complexul Energetic Turceni S.A. Up to date the Company did not breach any of the terms and conditions of the licence. Up to date, the Company has not entered into any supply agreement with eligible consumers; therefore no financial guarantee was created.

The production licence was granted under the following terms and conditions:

- The object of the licence consists of the authorization to run the operations related to the electricity production. The following activities are not included within its object: (i) electricity supply; (ii) electricity distribution; (iii) ancillary system services supply; (iv) co-generated heat production; (v) works/services supply to consumers; and (vi) any other activity which does not comply with the terms and conditions of this licence.
- The term of the production licence may not be extended; at its expiration, a new licence must be obtained.
- The Complex has the following rights: (i) to sell the generated electricity to electricity suppliers by entering into regulated or negotiated sale-purchase agreements or transactions on the spot market or to export it; (ii) to purchase electricity within the thresholds provided by its production licence by executing negotiated sale-purchase agreements or transactions on the spot market or to import it; and (iii) to acquire the specific services needed in order to sell the electricity on the wholesale market (i.e. system services, transportation agreements, administration of the wholesale market).
- Furthermore, the Complex is also allowed to carry out the following activities, based on separate licences: (i) distribution and supply to final consumers; (ii) ancillary system services supply; and (iii) co-generated heat production, transportation and trade.



- Financial guarantee: within three years of the issue of the licence, the Complex will create a bank deposit or a reserve fund or will execute a third party liability insurance for 1% of the share capital value, but not less than 1.5% of the annual turnover, irrespective of whether the electricity was sold to eligible consumers or to other parties
- The Complex will keep a separate book evidence of the activities subject to the licence
- The Complex will not cross-subsidise the electricity production activity and the co-generated heat production or any other activities concurrently carried out
- Quality: within 90 days of the licence issue, the Company will draft a quality management plan with respect to the electricity production
- The Complex will provide to ANRE the following documents: its financial statements (annually); a financial report with respect to the Complex activity (annually); and the loss and profit account (every six months).
- The transfer of the energy capacities to another legal entity will be made only with the ANRE's prior approval (failure to comply with this provision is a minor offence and triggers the nullification of the transfer)
- Any change of the statute of the Complex with respect to the spin-of, merger, transformation, change of the business object or of the share capital will be notified to the competent authority (ANRE) within 10 working days of its occurrence. Note: this obligation is relevant and must be observed in the context of the Proposed Privatization
- The establishment of a new company, subsidiary or branch will be notified within 60 working days prior to carrying out the legal procedure; within 30 working days, ANRE will issue its written approval or denial
- The Complex will ensure qualified and authorized personnel
- Assets and share transfers: the Complex will send a 30-day prior notice to ANRE, in relation to (i) any intention to transfer fixed assets used in connection to the electricity supply; (ii) any operation which triggers a reduction of the share capital with more than 25%; and (iii) any transfer of shares.

#### SUPPLY LICENCE

Licence No. 603 of April 23, 2004 was issued by ANRE in favour of the Complex for the supply of electricity. The licence is valid for eight years starting with the date of issue. This licence replaced the supply licence No. 556 of March 6, 2003 in order to reflect the reorganization of Electrocentrale Turceni S.A. (the initial holder) as Complexul Energetic Turceni S.A. None of the terms and conditions of the licence was breached so far.

The supply licence was granted under the following terms and conditions:

- The object of the licence consists of the authorization to supply electricity on the competitive market towards eligible consumers or any other final consumers
- The term of the supply licence may not be extended; when it expires, a new licence will be obtained
- The Complex has the following rights: (i) to supply electricity, namely to sell it to eligible consumers or to other consumers and to export it; (ii) to acquire electricity by entering into sale-purchase agreements, import, legal assignment of the rights owned by a legal entity and by transactions on the spot market; (iii) to execute transportation agreements; (iii) to have access to the information with respect to the electricity market; (iv) to transfer the rights and obligations arising out of the licence;



(v) to apply to the competent authority for the resolution of the pre-contractual disputes; and (vi) to appeal against any unfair act or action of the competent authority

- The Complex has the following obligations: (i) to supply electricity only upon agreement executed with the consumer; (ii) to enter into distribution/transportation agreements; (iii) to cease the electricity supply only to the consumers who failed to comply with the payment obligation, upon a five day prior notice; (iv) to ensure the access to the public electricity networks; (v) to meter the electricity supplied to the consumers and to invoice the electricity on an arm's length basis; (vi) to set up a communication system with the consumers; (vii) to answer to any reclamation against the licence holder; and (viii) to ensure a normal competitive environment
- Financial guarantee: prior to starting the supply activity, the Complex will set up a bank deposit or reserve fund or will execute a third party liability insurance averaging the necessary amount in order to carry out the on-going agreements for a 30-day period
- The Complex will ensure that there is no cross-subsidy between the activities authorized by the licence and other activities carried out by the Complex
- The Complex will notify the competent authority (ANRE) in relation to any change of the shareholding structure, 30 days' prior to the transaction completion in case of shares transfer or within five days of the registration of the share transfer with the Commercial Registry Office in case the shares are publicly held
- The Complex will keep a separate book evidence of the activities subject to the licence
- The Complex will send a 30-day prior notice to ANRE, in relation to (i) any intention to transfer fixed assets used in connection with the electricity supply or operation which triggers a reduction of the share capital of more than 25%; and (ii) any transfer of shares.

#### ANCILLARY SERVICES LICENCE

Licence No. 617 of June 4, 2004 issued by ANRE in favour of the Complex for the supply of ancillary services (*servicii tehnologice de sistem*) is valid for 25 years starting with the date of issue. Pursuant to the Electricity Law, the ancillary services are generally provided by producers holding a special licence, upon the request of the transportation and system operator. The licence for ancillary services supply was granted under the following terms and conditions:

- During the validity term of the licence, the Complex will supply ancillary services, with the installed production capacities, and will be separately paid for each such service supplied
- Upon the request of the transmission and system operator, the Complex will enter into ancillary services supply agreements
- The Complex will not deny any request of the transmission and system operator in relation to the supply of the ancillary services in compliance with the technical features and the production capacities, even if:
  - The holder of the licence did not enter into any ancillary services agreement; or
  - The quantities of the ancillary services exceed the contracted quantities.
- The Complex will ensure the technical conditions in order to be able to supply the ancillary services which exceed the contracted quantities to the transportation and system operator
- The Complex will respond to any demand coming from the transportation and system operator by allowing the monitoring and testing of the capacity of the production units



- Invoicing: the Complex will issue a monthly invoice (comprising the ancillary services categories, quantities and prices and tariffs) for the value of the supplied ancillary services
- The Complex will keep a separate book evidence of the activities subject to the licences that it holds
- Financial guarantee: within three years of the licence granting, the Complex will execute a third party liability insurance or will set up a reserve fund, to be maintained during the licence term
- Qualified personnel: the Complex will maintain qualified and authorized personnel at the production units
- Confidentiality: the Complex will ensure that the information acquired in relation to the commercial operations will not be disclosed to third parties, except as: (i) there is a prior written consent of the other party; (ii) the information is already public; (iii) the Complex has the obligation or the permission to disclose the information, by complying with the conditions of the licence, an order of the competent body or a law in force; and (iv) the information must be disclosed during the normal course of the Complex' business. Furthermore, the information disclosed to ANRE is deemed public
- Transfer: the total or partial transfer (by assignment) of the rights granted by this licence will be made only by contract, upon the prior consent of ANRE. Any partial or total transfer of the energy facilities to another legal entity will be made only with ANRE's prior approval (failure to comply with this provision is a minor offence and triggers the annulment of the transfer).

#### **MINING LICENSES AND AUTHORIZATIONS**

Turceni Energy Complex needs Concession Licenses issued by the National Agency for Mineral Resources - ANRM. However, in accordance with the provisions of the Mining Law, Art. 24 quoted in the "Required Mining Licenses and Authorizations for the New Energy Complex" chapter earlier in this report, existing licenses, specifically Exploitation License no. 2603/2001 for Jilt Sud, Exploitation License no. 2602/2001 for Jilt Nord, and the Exploitation License for EMS Dragotesti have been transferred to the Complex, upon notification of ANRM. The contents of these licenses cannot be disclosed without the written agreement of ANRM.

Mining licenses will be treated as per provisions of state secret legislation.

### **10.6. Financing, Loans, Obligations, Liabilities**

#### **DOMESTIC AND FOREIGN SHORT-TERM LOANS**

##### **Overview:**

Except for a short-term loan agreement (overdraft), which is currently in force, between the Company, as borrower, and Raiffeisen Bank SA ("RZB"), as lender, the Company is not a party to other short-term loan agreements as of the date of this Report.

##### **RZB Credit Facility:**

RZB made available to the Company, an overdraft credit facility amounting ROL 50,000,000,000, to be used for financing the working capital needs of the Company (i.e., Credit Agreement No. 474 dated 16 August 2004 (the "RZB Credit Agreement")). The interest is variable, having an annual rate equal to the base rate (*Rata de Bază*) (periodically modified by the Bank and displayed at the headquarters of the agencies of the Bank, representing the average between the values of EONIA, USD LIBOR O/N, BUBOR O/N as the case may be, calculated for the past 22 working days), plus a margin of 0.95%. The



penalty interest is variable, periodically modified by the Bank and displayed at the headquarters of the agencies of the Bank. The origination fee is 0.50% of the principal amount. The administration (utilisation) fee is 0.25% of the principal amount.

The Borrower must notify the Bank in writing about any proposal concerning the modification of the constitutive act (including changes in the shareholding structure), the de-merger, merger or other procedures of corporate restructuring or liquidation, or the participation to the share capital of other companies.

The facility is uncommitted; the Bank is entitled to stop at any time and without any reason the availability of the facility. Should any event of default occur, the Bank may demand the loan acceleration or may declare null any unused part of the facility. The following are considered to be events of default:

- Non-payment at the maturity of the due amounts
- Use of the facility for other purposes than those agreed
- Representations of the Company proved to be untrue
- Securities which become unsatisfactory in the opinion of the Bank
- Negotiations with third creditors for re-scheduling
- Bankruptcy, insolvency of the Company
- Start of an administrative, judiciary or arbitral procedure against the Company, which may negatively affect the capacity of the Company to fulfil its obligations.

The Company must route through its accounts opened with the Bank at least 50% of the monthly turnover, under the sanction of an increased interest (from 0.95% to 2.95%), until the moment the Company fulfils its obligation. The credit agreement is valid for one year unless the Bank notifies the Company of its earlier termination. The Company has pledged to RZB its bank accounts opened with RZB and all the present and future receivables against the following debtors:

- FDFEE Electrica Moldova S.A.
- FDFEE Electrica Oltenia S.A.
- FDFEE Electrical Transylvania Nord S.A.
- FDFEE Electrica Transilvania Sud S.A.

## DOMESTIC AND FOREIGN LONG-TERM LOANS

### Overview:

#### *JBIC Credit Agreement*

It was anticipated that by March 31, 2005 the Romanian State through the Ministry of Public Finances would enter into a loan agreement, principal amount of ¥ 28,746,000,000 (the “**Main Loan Agreement**”) for the implementation of the Turceni thermal power plant pollution with sulphur dioxide abatement project (the “**Project**”). The Japanese Bank will grant the loan for International Cooperation (“**JBIC**”). More details on the terms and conditions of this loan are in Section 10.6.9

As a take over mechanism of expenditures by the Company, the Public Debt Law No. 313/2004 provides that the Company, in its capacity as the final beneficiary of the loan, shall further enter into an on-lending loan agreement with the Ministry of Public Finance (the “**On-Lending Loan Agreement**”).



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It is noteworthy that the provisions of the Main Loan Agreement (including but not limited to change of control and negative pledge provisions) will be applicable to the On-lending Loan Agreement and therefore binding on the Company.

#### **LOANS RELATING TO TERMoeLECTRICA S.A.**

As of the date when the Take Over Protocol No. 4290 of March 11, 2003 was signed, regarding the transfer of the assets and liabilities of Electrocentrale Turceni branch from the patrimony of Termoelectrica to the patrimony of the then newly incorporated subsidiary, Electrocentrale Turceni S.A., the Company (at that time Electrocentrale Turceni S.A.) agreed to undertake the outstanding debts arising from eight loan agreements entered into by Termoelectrica (as borrower) for the purpose of financing the acquisition of fuels or for the purpose of rehabilitation of the energy units, pro rata with the proceeds of the loan that were used for the Company's activity, including interests, fees and losses from exchange rates.

The Take Over Protocol was concluded in accordance with the Government Decision No. 1524/2002 regarding the reorganization of Termoelectrica.

Also, Termoelectrica owes to the Company certain amounts arising from the supply of energy to Termoelectrica. Pursuant to the representations of the Management Team, the balance with Termoelectrica is determined by a set-off mechanism based on monthly scoring (*punctaj*).

The status of mutual obligations of TEC with Termoelectrica is described in Chapter 9.

According to the situation provided in Chapter 9, the debit balance of the account "Debtor SC Termoelectrica SA" exceeds the credit balance of the account "Creditor SC Termoelectrica SA", which implies that the Company has so far duly paid the debt related to the credit facilities granted to Termoelectrica.

#### **BANK ACCOUNTS**

According to the TEC management, the Company has opened bank accounts with Raiffeisen Bank S.A., Banca Comerciala Romana S.A. and with Rovinari Treasury.

#### **THE DRAFT JBIC LOAN AGREEMENT**

The following represents a short review of main provisions of the JBIC loan agreement for financing the implementation of 4 Flue Gas Desulphurisation ("FGD") units at Turceni Thermal Power Plant.

In accordance with the draft loan agreement for Turceni Thermal power Plant Pollution Abatement Project between Japan Bank for International Cooperation and Romania dated December 1, 2004, the Table of Contents is:



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## Article 1 – Loan

- Amount and purpose of loan

The bank agrees to lend the borrower an amount not exceeding 28,746,000,000 Japanese yen as principal for the implementation of the Turceni Thermal power Plant Pollution Abatement Project, described in Schedule 1.

- Use of proceeds of loan

The loan will be used for the purchase of eligible goods and services necessary for the implementation of the project from suppliers, contractors or consultants.

The final disbursement shall be made not later than the same day and month 8 years after the effective date of the loan agreement.

## Article 2 – Repayment and interest

- Repayment of principal

In accordance with schedule 3

- Interest and method of payment thereof

The borrower shall pay interest to the bank semi-annually at the rate of 0.75% per annum on the principal corresponding to categories a, b and c below disbursed (principal and outstanding):

- a. principal disbursed out of the proceeds of the loan allocated to categories A, B and C (schedule 2, section 1)
- b. service charges disbursed out of the proceeds of the loan with respect to the disbursement of a. above.
- c. Any principal reallocated from category D (schedule 2, section 1) and disbursed with respect to a. or b. above.

The borrower shall pay to the bank, prior to the date of the completion of disbursement of the proceeds of the loan (completion date), on January 20 of each year the interest that has accrued up to December 19 from June 20 of the preceding year, and on July 20 of each year the interest that has accrued up to June 19 of that year from December 20 of the preceding year, and, ii. after the completion date, on December 20 of each year the interest that has accrued up to December 19 from June 20 of that year, and on June 20 of each year the interest that has accrued up to June 19 of that year from December 20 of the preceding year.

## Article 3 – Particular covenants

- General terms and conditions

Bank's general terms and conditions for ODA loans, October 1999.

- Procurement procedure

In accordance with Schedule 4.

- Disbursement procedure

Commitment procedure – Schedule 5

Reimbursement procedure – Schedule 6

Transfer procedure – Schedule 7

- Administration of loan

The borrower shall authorize the SC Complexul Energetic Turceni SA – the Executing Agency to implement the project. The borrower should cause the executing agency to employ consultants for the implementation of the project. Should the funds available from the proceeds of the loan be insufficient for the implementation of the project, the borrower shall make arrangements promptly to provide such funds as shall be needed. The borrower may, out of the proceeds of the loan make a loan/s to the executing



agency (sub-loan) for the implementation of the project. The terms and conditions of the sub-loan should be no less favorable than those of the loan agreement.

The borrower shall cause the Executing Agency to furnish the bank with progress reports for the project on a quarterly basis (March, June, September, December of each year) until the project is completed. Promptly, but not later than 6 months after completion of the project, the borrower shall cause the Executing Agency to furnish the bank a project completion report. The borrower shall make sure that ex-post procurement audit is carried out by independent auditors to be employed by the bank in order to ensure fairness and competitiveness of the procurement procedure.

- Modification

Any modification – agreed in writing between the bank and the borrower.

- Notices and requests

**Schedule 1 – Description of project**

Section 1 – outline of the project

1. objective – to install the FGD system for 4X330MW generators and to construct complimentary facilities in TEC in order to reduce SO2 pollution
2. scope of work - procurement and installation of a FGD system and consulting services

Section 2 – estimated annual fund requirements

Fiscal year	For the loan (M Jap Y)	For the project (M Jap Y)
2005	78	94
2006	76	92
2007	5098	6791
2008	6826	9069
2009	10045	13331
2010	4938	6495
2011	1685	2456
Total	28746	38328

1ROL=0.0034YEN

The project is expected to be completed by November 2011.

**Schedule 2 – Allocation of proceeds of loan**

Section 1 – allocation

Category	Amount of the loan allocated (M Y)	% of eligible expenditure to be financed
A. Civil works and equipments	21,629	100
B. Consulting services	707	100



C. Interest during construction	675	-
D. Contingencies	5,735	-
Total	28,746	

Items not eligible for financing:

- General administration expenses
- Taxes and duties
- Purchase of land and other real property
- Compensation
- Other indirect items

**Section 2 – interest during construction**

Category C indicates the estimated cost of interest on the principal disbursed and outstanding during construction. The bank shall be entitled to disburse as principal out of the proceeds of the loan and pay to itself, on behalf of the borrower, the amounts required to meet payments, when due, of interest during the construction period of the project. The final date of such disbursement shall be determined by the bank. The borrower shall pay to the bank in yen an amount equal to 0.1% of the amount of the disbursement mentioned above as the service charge thereof on the date of such disbursement. The bank's disbursement under this procedure shall be made upon receipt of the service charge from the borrower.

An amount equal to such service charge shall be financed out of the proceeds of the loan, and the bank shall immediately pay such amount to itself as the service charge on the date of the of the disbursement from the borrower. Such disbursements out of the proceeds of the loan shall constitute a valid and binding obligation upon the borrower under the terms and conditions of the loan agreement.

**Section 3 – reallocation upon change in cost estimates**

If the estimated cost of items included in any of categories A through C shall decrease, the amount then allocated to, and no longer required for, such category will be reallocated by the bank to D. If the estimated cost of items included in any of categories A through C shall increase, the amount equal to the portion, if any, of such increase to be financed out of the proceeds of the loan, will be allocated by the bank, at the request of the borrower, to such category from D, subject, however, to the requirements for contingencies, as determined by the bank, in respect of the cost of items in the other categories.

**Schedule 3 – Amortization schedule**

Repayment of principal	
Due date	Amount (yen)
On December 20, 2014	471,300,000
On each June 20 and December 20 beginning June 20, 2015 through Dec. 20, 2044	471,245,000

**Schedule 4 – Procurement procedure**

**Section 1 – guidelines to be used for procurement under the loan.**

Procurement of all goods and services, except consulting services, to be financed out of the proceeds of the loan shall be in accordance with Guidelines for procurement under JBIC ODA loans dated October 1999 (procurement guidelines). Employment of consultants to be financed out of the proceeds of the loan shall be in accordance with Guidelines for the employment of consultants under JBIC ODA loans dated October 1999 (consultant guidelines).



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## Section 2 – eligible source countries

The eligible source country/ies for procurement of all goods and services, including consulting services, to be financed out of the proceeds of the loan are all countries and areas.

## Section 3 – the bank's review of decisions relating to procurement of goods and services (except consulting services)

Before inviting bids, the executing agency shall submit to the bank, for its review and concurrence, the tender documents such as the notices and instructions to the bidders, bid form, proposed draft contract, specifications, drawings and all other documents related to the bidding, together with a Request for review of tender documents. When the bank has no objection to the said documents, the bank shall inform the executing agency accordingly by issuing a Notice regarding tender documents.

When the executing agency wishes to make any subsequent alteration to any of the said documents, the bank's concurrence is to be obtained before the documents are sent to prospective bidders.



## 10.7. Competition Issues

### COMPETITION ISSUES RELATING TO ELECTROCENTRALE TURCENI

#### Industry-Specific Regulation:

According to the Handing-Over Protocol entered into between Termoelectrica and Electrocentrale Turceni, the newly established company shall be bound to pay its relevant quota of the loan agreements concluded by Termoelectrica at a prior moment, on a pro rata basis, according to the level of usage of any such loan.

The Company agreed through the Spin-off Protocol, to undertake the payment of all the future commitments deriving from the above mentioned loan agreements contracted by Termoelectrica in order to sustain the financing of fuel purchases and power units modernization, representing interests, commissions and foreign currency losses charges, in the proportion used for its activity.

Though these funds are not granted to Electrocentrale Turceni, certain loan agreements have a sovereign guarantee. According to the definitions and forms of the State Aid such guarantees could be qualified as State Aids only through an extended interpretation of the relevant legal provisions.

As resulted from the documentary evidence and according to the statements of the Management Team, E.M.C. Jilt does not benefit of any fiscal incentives.

Pursuant to the Balance Sheet of Electrocentrale Turceni for 2003, as drafted by KPMG Audit SRL, according to the Order of the Ministry of Finance No. 94/2001, it results that the subventions granted to Electrocentrale Turceni for investments, were of ROL 940,239,222 at the end of the 2003.

The total investments program for 2003 was of ROL 965,810,000.

According to the Notes to the Balance Sheet, the subventions were granted to Electrocentrale Turceni for financing the investments (the rehabilitation of the Power Generation Block No. 5), from the special fund for development of the power system constituted by the Ministry of Industry and Resources.

According to the statements of the Management Team, there are no other subventions and/or tax incentives granted to TEC that could be qualified as State Aid.

#### *Preferential Loan*

Pursuant to the provisions of the Government Emergency Ordinance No. 97 of 10 November 2004 (the “**GEO No. 97**”), published in the Official Gazette No. 1083 of 22 November 2004, TEC has been granted a loan of 600,000 tones of coal and 7,000 tones of crude oil. The GEO No. 97 departs from the provisions of the Law No. 82 of 21 July 1992 (the “**Law No. 82**”) regarding the state reserves, by excepting the beneficiaries of the loan of depositing the guarantee provided by article 5 paragraph 2 of the Law No. 82.

### COMPETITION ISSUES RELATING TO E.M. JILT

According to the documentary evidence provided by the Company management, it results that E.M. Jilt:

- (i) did not file any application, notification and/or correspondence with the Competition Council or with any other public or regulatory authorities in respect of its commercial practices;
- (ii) has not entered into any agreement of the nature of limiting the competition on the market or abusing of a dominant position;



- (iii) has not been and is not subject to any investigation, claim, litigation or action performed by (ANRM, the Competition Office, the Competition Council) or by the competition practices relevant judiciary bodies;
- (iv) has not entered into any tax avoidance agreement; and
- (v) does not benefit of any tax incentives.

## 10.8. Litigations

### CONTEXT

Pursuant to the take over protocols (i) Termoelectrica to Electrocentrale Turceni SA of the assets and liabilities of the Electrocentrale Turceni branch (signed on 11 March 2003) and (ii) CNLO to Complexul Energetic Turceni of the assets and liabilities of EM Jilț and of Dragotesti mine (signed on 16 June 2004), all the related litigation were assumed by the receiver entity.

As branches, which do not form legal entities, Electrocentrale Turceni, EM Jilț and Mine Dragotești cannot stand in court on their own. There is one exception admitted by the Romanian jurisprudence, referring to the situation that such right had been granted to the branches by the statutory documents of the mother company or by a special power of attorney given for the purposes of representing the company in front of the court. Any references to those entities as a party in litigation shall be interpreted as the capacity of the mother company to stand in front of the court as defendant or plaintiff.

### EM JILȚ LITIGATION ASSUMED BY THE COMPANY

According to the Management Team, EM Jilț is involved in several litigations either as a plaintiff or as a defendant. Litigations with legal persons, lawsuits where the Company is a creditor and where the Company is a debtor, litigations with natural persons are provided in Appendix 11. There are some real estate related lawsuits and some litigation having as object Law No. 10/2001. Apparently, none of these disputes exceed ROL 500,000,000.

The closest value to this amount seems to be incurred in the litigation with Dascălu Elena (file No. 3664/2004 pending with the Gorj Tribunal). According to the information documents, the plaintiff Dascălu Elena claimed for the counter value of the production for 5 years, estimated at ROL 404,589,682. EM Jilț requested by reconvention the compelling of Dascălu Elena to execute the sale-purchase agreement in authentic form.

### ELECTROCENTRALE TURCENI AND THE COMPANY LITIGATION ASSUMED BY THE COMPANY

According to the management, there are two litigations pending on the High Court of Justice and Cassation. Four court cases involving the Company exceed ROL 500,000,000.

## 10.9. Labor Relationships: How Relevant It Is After Introduction of a New Labor Code

### COLLECTIVE LABOUR BARGAINING AGREEMENTS

#### Overview:

In Romania, unions and employers' associations may negotiate and execute collective labour bargaining agreements ("CLBA"), which are legal documents of mandatory and general application. By definition,



any individual labour agreement (the “**ILA**”) executed in Romania must comply with the minimum employee protection requirements set forth in the CLBA executed at different levels.

Romanian legislation establishes specific rules relating to unions and CLBA. In accordance with Law No. 130 of 16 October 1996 (the “**CLBA Law**”), an employer must start negotiations for a CLBA if it has more than 21 employees. However, even if the employer is under the obligation to initiate negotiations, entering into a CLBA is not legally mandatory if the parties do not reach a consensus. Failure to initiate the execution of the CLBA triggers fines to be paid by the subject company.

If the employees are not members of a union, the negotiations will be carried out between the employer and the employees’ representatives, appointed by secret vote.

Failure to reach a consensus and to execute a CLBA may trigger a “collective labour conflict,” which may lead to a strike. A standard CLBA mainly covers: wages, working conditions, social security provisions, dispute settlement provisions, protection of trade union leaders, training programs and miscellaneous rights and obligations of the employer and employees. These provisions apply to all employees of a company, regardless of whether they were employed on the date of its conclusion or whether they are members of the union that executed the CLBA.

#### **CLBA at the National Level, National Branch Level and Company Level:**

According to the special provisions of the government decision No. 103/2004 the employees of the entities that were merged into the Company will benefit of all the rights and facilities granted by the existing collective labour agreements until a single new CLBA, adequate to the new energy complex structure and activities, will be approved. Accordingly, the Company’s employees benefit of two CLBAs, one for each field of activity, for the employees in the energy sector and for the mining sector, respectively:

- (a) CLBA of Termoelectrica SA registered under No. 18834, concluded on December 20, 2002 for a 5 year term – energy field; and
- (b) CLBA of the National Company of Lignite (CNLO) (the “**CNLO Mining CLBA**”) registered under No. 16, concluded on February 19, 2004 for a 1 year term – mining field.

#### **Brief comparison between the provisions of the applicable Collective Labour Bargaining Agreements:**

##### ***National CLBA and Mining Branch CLBA***

Generally, the branch specific CLBA contains more favourable rights for the employees than the National CLBA. Below are described a few rights provided by the Mining Branch CLBA which are more favourable than those provided under the National CLBA.

**Minimum salary:** Pursuant to the provisions of the Mining Branch CLBA, at the branch level, the minimum base salary (negotiated for a monthly working schedule of 170 hours) is higher with 50 per cent than the economy minimum legal wage.

**Working hours:** The Mining Branch CLBA provides an average number of working hours, which is 8 hours per day and 40 hours per week for the surface activities and of 6 hours per day and 30 hours per week for the underground activities or for the activities carried out in a radioactive environment.

The Mining Branch CLBA provides a minimum of 6 legal holidays per year, the “mining day” being approved for August.



**Employees’ benefits for dismissal:** In case of dismissal, excluding the employee’ fault, the Company shall pay to the dismissed employee indemnities based on the length of service:

**Table 10.1: Benefits for Dismissal — National CLBA and Mining Branch CLBA**

Length of Service	Minimum Quantum of Indemnity
1 to 5 years	One base salary
5 to 15 years	Two base salaries
over 15 years	Three base salaries

**Special benefits:**

- For a first degree of invalidity as a result of a work accident an indemnity amounting to one gross salary and for a second degree of invalidity an indemnity amounting to two gross salaries shall be granted to the affected employee;
- The family members of the employee deceased because of a work accident, or as a consequence of a work accident or of a professional disease, shall receive 8 (eight) average gross salaries at the company level (the National CLBA provides only 3 (three) salaries);
- The Company must provide free supplementary meals according to the specific legislation;
- The employees are entitled to receive free meals at the beginning of the shift, free protection equipment, free transportation to/from the working place.

There is a special clause concerning the termination of the labour contract in the event the employee does not fulfil at least 75% of the work normative or of the contractual tasks, within normal working conditions, for more than 3 months consecutively or within 6 months alternatively. This termination is subject to the prior approval of the trade union.

***CNLO Mining CLBA***

Below are described several rights provided by the CNLO Mining CLBA which are more favourable than or depart from those provided under the National CLBA or Mining Branch CLBA.

According to the CNLO Mining CLBA, the number of employees and the salary fund shall be decided by the Board of Directors.

The clauses of the individual labour agreements shall be renegotiated on a yearly basis. In case of dismissal for causes other than the employee’s fault, the affected employee has the right to a prior notice of one calendar month. In case of resignation, the employee must notify the employer one calendar month in advance. According to CNLO Mining CLBA, the retirement under the Law No. 19/2000 regarding public pensions and other social insurance systems, published in Official Gazette No. 140/2000 shall be compensated based on their length of service with:

**Table 10.2: Benefits for Dismissal — CNLO Mining CLBA**

Length of Service	Minimum Quantum of Indemnity
Retirement for age limit	Six base salaries
Anticipated retirement	Six base salaries plus one base salary for each anticipated year of retirement
Partial anticipated retirement	Ten base salaries



The Company is obliged to reemploy the personnel temporarily retired for causes as professional diseases, specific diseases, work accidents or regular diseases. The management shall provide free supplementary meals for the personnel working in dangerous or unhealthy environment.

**Special benefits:**

- In case of decease, the family shall receive an indemnity of 3 average gross salaries at the company level
- For a deadly work accident, the successors shall receive an indemnity of 9 average gross salaries at the company level
- In case of decease caused by a professional disease, the affected employee shall receive 6 average gross salaries
- In case of invalidity caused by work accidents, the employee shall receive for (i) first degree invalidity – 6 average gross salaries at the company level; (ii) second degree invalidity – 3 average gross salaries at the company level
- Over 3 working hours between 22 and 6 a clock each day shall be indemnified with a 25% bonus
- A coal allocation of 8 tones per year for miners and 6 tones per year for the other employees shall be granted.

***Termoelectrica Energy CLBA***

Termoelectrica Energy CLBA was amended with the provisions of the new Labour Code through the Additional Act No. 1722/03.03.2003. The Protocol concluded by Electrocentrale Turceni in its capacity as a branch of Termoelectrica (according to article 1.5 of the Termoelectrica Energy CLBA, all the branches of Termoelectrica should conclude such Protocols) also suffered some adjustments through Additional Acts concluded on May and September 2003.

The minimum gross salary of the employees subject to the Termoelectrica Energy CLBA is EUR 100 payable in ROL equivalent. The notification of dismissal for causes other than the fault of the employee shall be issued at least 20 working days in advance, in comparison with the 15 days term provided by the Labour Code. In case of dismissal excluding the employee’ fault, the Company shall pay to the dismissed employee indemnities calculated according to class 39H of the Company remuneration grid and based on the length of service:

**Table 10.3: Benefits of Dismissal — Termoelectrica Energy CLBA**

Length of Service	Minimum Quantum of Indemnity as of 1 January 2003
6 months to 5 years	7 gross salaries for class 39H
5 to 10 years	8 gross salaries for class 39H
10 to 20 years	14 gross salaries for class 39H
over 20 years	16 gross salaries for class 39H

According to Termoelectrica Energy CLBA, retirement under the Law No. 19/2000 regarding public pensions and other social insurance systems, published in *Official Gazette* No. 140/2000 shall be compensated with:

**Table 10.4: Benefits of Retirement — Termoelectrica Energy CLBA**

Length of Service	Minimum Quantum of Indemnity
Up to 10 years	Over 25 years



Length of Service	Minimum Quantum of Indemnity
10 to 25 years	2 gross salaries for base class
Over 25 years	3 gross salaries for base class

### Special benefits:

- In case of deadly work accident or decease caused by professional diseases the successors shall receive an indemnity of 12 gross salaries at the level of the last month of employment
- For total loss of the working ability, the Company will pay the difference between the base salary plus bonuses and the invalidity pension for a one year term
- Temporary work disability caused by work accident or professional diseases shall be compensated with 100% of the base salary plus bonuses.

## INDIVIDUAL LABOUR AGREEMENTS

### Overview:

All employees of Romanian companies, including foreign employees, must enter into an individual labour agreement (the “**ILA**”) with their employer. Any ILA executed in Romania must observe the minimal employee protection requirements set forth (i) in the CLBA at the national level, at the industry specific level, at the group company level and at the company level, as well as (ii) in the labour legislation. The ILA usually stipulates the gross salary, duties, working hours, overtime (if applicable), benefits, holiday entitlements, etc. According to the Romanian labour legislation, ILA must be executed in writing and must be registered with the competent Territorial Labour Inspectorate within 20 days of the execution date. By law, the employer has the obligation to establish and maintain a general register of employees (the “**Register of Employees**”). This Register of Employees replaces the former labour cards (*cărți de muncă*), usually kept by the Territorial Labour Inspectorates.

### Standard ILA:

The Company entered into ILAs with all its employees by using a standard ILA (the “**Standard ILA**”), provided by the applicable CLBAs. The ILAs are concluded for daily work duration of 8 to 12 hours, with maximum 48 hours per week. The overtime (maximum 8 hours per week) is compensated with free/non working paid time during the next 30 days. All the positions included in the organizational chart are necessary for the activity of the company. The gross salary is determined by the grid of salaries (appendix to the CLBAs) and according to the criteria of employment and promotion and the thresholds of salary. Pursuant to the representations of the Management Team, in 2003, the gross salaries represented 63% of the salary fund (the rest of 37% representing fringe benefits).

The agreements contain specific clauses, which may vary from one employee to another, even between employees occupying similar positions within the company. The differences concern especially the gross salary, the holiday and the fringe benefits (for the length of service, night work, work performed during free days of during legal holidays).

## LABOUR RELATED LITIGATION

Pursuant to information of the TEC management there are four labour disputes involving EM Jilt as a defendant. In other two files, EM Jilt is involved as a party responsible for its employees. Any such litigation has a value exceeding 500.000.000 ROL. The file No. 13346/2002 having Mr. Băsescu Gheorghe as plaintiff was suspended on Tg Jiu district court until the final settlement of the file No.



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2559/2003 (pending on Motru district court, Bănescu Gheorghe vs. CNLO). The value claimed by CFR as plaintiff (file No. 314/p/2004) is of 4,670,748,365 lei representing damages. EM Jilt filed recourse at the High Court of Justice and Cassation.

## 10.10. Environmental Matters

### INTRODUCTION

Under the Law No. 137 of December 29, 1995 regarding the environment protection (the “**Environment Protection Law**”, the basic principle for environment protection is that all the activities capable of having a negative impact on the environment can only be carried out with a special permit. Permits bear various names and differ according to whether they are required for implementing a project (“**Environmental Permit**” – *acord de mediu*) or for operating a particular activity (“**Environmental Authorization**” – *authorization de mediu*) or for certain specific transactions, including the change of control by privatization (“**Environmental Consent**” – *avis de mediu*).

Environmental Authorizations are required for certain facilities and/or technological processes, as determined by law. Environmental Authorizations are issued for a period not exceeding five years and have to be renewed in order for a company to legally continue its operations. A compliance schedule may accompany the Environmental Authorization and is negotiated between the project manager, within the respective company, and the environmental authority. It contains special measures for environment protection and timing for their implementation. The compliance schedule covers the validity period of the environmental operating permit to which it is attached. Failure to observe the compliance schedule may lead to the suspension of the Environmental Authorization and of the activity of the Company.

The Environmental Permit is required for designing and implementing a new project, amending an existing project or for the decommissioning of a project with a significant impact on the environment. It grants the right to develop the project and provides the environmental requirements to be observed. This approval does not grant the right to operate the project. For this purpose an Environmental Authorization is required.

### ENVIRONMENTAL AUTHORIZATIONS HELD BY THE COMPANY

Pursuant to the Environment Protection Law the Company is required to obtain Environmental Authorizations for each of the Company’s premises (*e.g.* headquarters, sectors, working points etc. (collectively “**units**”)) according to Government Decision No. 573 of 13 June 2002 concerning the approval of the authorization procedure for the operation of traders, mining activities together with the activities related to the production of electricity and heat is considered to be an activity with a significant impact on the environment and the Company has the obligation to obtain Environmental Authorizations for such activities.

The Company holds the following Environmental Authorizations:

- (i) Environmental Authorization No. 956 of October 30, 2001 regarding the operation of Electrocentrale Turceni, branch of Termoelectrica S.A. Though the authorization has been granted to Termoelectrica S.A., predecessor of Complexul Energetic Turceni S.A., the annex to the Registration Certificate of the Company provides that the latter operates on the grounds of the Environmental Authorization No. 956 of October 30, 2001.

The authorization is issued under certain conditions to be fulfilled, specifically conformation with the compliance schedule annex to the authorization and with the Environmental Permit Gj-298 of October 12, 2001, and conclusion of an insurance agreement on the major risk activities.



(ii) Environmental Authorization No. 887 of October 25, 2004 regarding the operation of Complexul Energetic Turceni, Jilț Mining Exploitation – Jilț Nord mine.

The Company is compelled to inform the issuer in relation to any fundamental change of the conditions taken into consideration at the issuance, changes of the destination, of the ownership or cessation of the activity. At the same time, the Company must ensure its own supervision systems for the installations and technological processes and for the analysis and control of the polluting substances in the operation area.. The additional conditions are presented in Chapter 8 - Environment:

A compliance schedule annexed to the authorization provides certain objectives to be accomplished until 2008. This authorization expires on December 31, 2008.

(iii) Environmental Authorization No. 888 of October 25, 2004 regarding the operation of Complexul Energetic Turceni, Jilt Mining Exploitation – Jilt Sud qmine.

The authorization provides the same obligations and conditions as those mentioned by the Environmental Authorization No. 887 of October 25, 2004. The authorization has the same annexes providing identical obligation as the authorization issued for Jilț Nord quarry. The annex referring to the authorized activity mentions besides exploitation of the lignite in the quarry, operations of general mechanics. Certain objectives to be achieved until 2008 were established through a compliance schedule annexed to the authorization. The compliance schedule is presented in Chapter 8 – Environment. The authorization expires on December 31, 2008.

(iv) Environmental Authorization No. 889 of October 25, 2004 on the operation of Complexul Energetic Turceni, Jilt Mining Exploitation – Tehomir mine.

The authorization provides the same obligations and conditions as those mentioned by the Environmental Authorization No. 887 of October 25, 2004. The authorization has the same annexes providing identical obligation as the authorizations issued for Jilț Nord and Sud quarries. The annex referring to the authorized activity mentions besides exploitation of the lignite in the quarry, operations of general mechanics and carpentry workshop. The authorization expires on December 31, 2008. A compliance schedule providing the objectives to be achieved until 2008 has been annexed to the authorization and it is presented in Chapter 8 – Environment.

#### **WATER ADMINISTRATION AUTHORIZATIONS**

Pursuant to the Law No. 107 of September 25, 1996, on water (the “**Water Law**” the right to use the surface or subterranean waters is established through a water administration authorization, issued by the National Authority “Apele Romane”. The water administration authorization establishes, from a technical and legal standpoint, the operation and exploitation of the premises build on waters or which are related to a water resource as defined by law. The following water administration authorizations granted to Electrocentrale Turceni S.A., subsidiary of Termoelectrica S.A., and to the mining exploitation Jilț can be enumerated:

- (a) Water administration authorization No. 744 of August 4, 2003 The authorization expired on August 15, 2004, but according to the information provided by the TEC management the documentation for the renewal of this authorization has been submitted to the competent authority – i.e. National Agency “Apele Române” Jiu Craiova;
- (b) Water administration authorization No. 42 of August 1, 2003 on the evacuation of waste waters at the mining exploitation Jilt – Jilt Nord mine. The authorization expires on August 1, 2005;
- (c) Water administration authorization No. 43 of August 1, 2003 on the evacuation of wastewaters at the mining exploitation Jilt – Jilt Sud mine. The authorization expires on August 1, 2005;



(d) Water administration authorization No. 44 of August 4, 2003 on the water supply of mining exploitation Jilt – administrative headquarters. The authorization expires on August 4, 2005;

Pursuant to the information provided by the Management team, these authorizations were not renewed, being considered as valid by the competent authority.

The permits have been issued in accordance with the provisions of Water Law 107/1996 setting out the requirement for a water permit and subsequent MAPM Minister's Order 1141/2002 outlining and approving the procedure and competent authorities responsible for the issuance of such a permit. The Water Permit lists quality indicators the permit holder must ensure at the water discharge points in accordance with provisions of NTPA 001/2002. Monthly water quality testing is indicated in the permit.

The Water Permit also provides a full list of permit holder obligations, including as follows:

- Maintenance of water treatment and disposal facilities in accordance with technical specifications and ensuring minimum water loss;
- Maintenance of Jiu river banks and Jiu river bed in the water disposal areas;
- Immediate telephone notification to Gorj Water System and Directia Apelor Jiu Craiova authorities in case of quality indicators exceeding authorized levels.

#### **OTHER AUTHORIZATIONS**

##### **SANITARY AUTHORIZATION**

There are three such authorizations issued by the Ministry of Health – Gorj Public Health Division, namely authorization no. 2775/2000 for the headquarters, authorization no. 2776/2000 for EMC Jilt Sud and authorization no. 2777/2000 for EMC Jilt Nord (collectively referred to hereinafter as “Sanitary Authorization”).

##### **LABOR PROTECTION AUTHORIZATIONS**

The work safety authorization No. 1719 of September 15, 2004 for Jilt Nord

The work safety authorization No 1720 of September 15, 2004 for Jilt Sud

The work safety authorization No 1721 of September 15, 2004 for Tahoma (Dragotesti) mine

The Tahoma/Dragotesti mine also holds an authorization for ownership, transportation, commerce and use of explosives.

##### **INTEGRATED ENVIRONMENTAL AUTHORIZATION**

The Government Emergency Ordinance No. 34 of March 21, 2002 (“**GEO 34/2002**”), on the integrated pollution prevention, and control establishes the obligation of companies operating certain industrial activities to obtain an integrated environmental authorization (the “**Integrated Environmental Authorization**”). According to the Procedure dated October 17, 2003 (the “**Integrated Environmental Authorization Procedure**”) regarding the issuance of the Integrated Environmental Authorization request of this authorization is mandatory for running the activities and installations provided by the above-mentioned annex to the GEO 34/2002. Commencement of the procedure is given by the notification that the local authorities for the environment protection had to send to the holders of activities and installations requiring integrated authorization within 20 days as of the entering into force of the Integrated Environmental Authorization Procedure – i.e. until December 3, 2003.



The Company did not obtain the Integrated Environmental Authorization. Pursuant to the representations of the Management Team, the agencies for the environmental protection are currently performing the necessary measures for the issuance of such authorization (personnel trainings), mentioning that these circumstances might persist in the first part of the year 2005. Therefore, the Integrated Environmental Authorization is expected to be obtained only after the expiration of the Environmental Authorization No. 956 of October 30, 2001.

#### **ENVIRONMENTAL CONSENT FOR PRIVATIZATION**

Pursuant to Article 31 of the Government Emergency Ordinance No. 88 of December 23, 1997 on the privatization of commercial companies (the “**Privatization Ordinance**”) in the event the prospective buyer gains control over a company undergoing privatization by purchase of shares in that company, the latter must prepare an environmental audit, on which basis the relevant environmental authorities will issue the Environmental Consent. Under Article 122 of the Methodological Norms no. 577/2002 for the application of the Privatization Ordinance, (the “**Privatization Norms**”) companies where the State has a controlling stake must start proceedings to obtain Environmental Consents, containing all environmental obligations of that company, the compliances schedule, and the responsibilities for environmental pollution by that company in its past activity.

The environmental obligations and liabilities so established shall be included in the presentation file/offering prospectus, as provided in Article 13 (2) of the Law No. 137 of March 23, 2002 regarding certain measures for the acceleration of privatization (the “**Privatization Law**”). Pursuant to Article 127 of the Privatization Norms, when executing the sale-purchase agreement, the investor must undertake all or part of the environmental obligations and liabilities and must establish, together with the Involved Public Institution, an investment plan for the execution of the compliance plan.

Under Article 129 of the Privatization Norms, the Involved Public Institution may undertake to indemnify, defend and keep the investors harmless of any environmental liability not disclosed to the investor established through definitive and irrevocable court decision within 5 years from the sale-purchase contract. However, under the Privatization Law, the total amount of the indemnity to be paid to the investor is 50% of the price paid effectively by the investors.

There are six Environmental Consents regarding the privatization of the Company. All of them provide for the following conditions to be fulfilled by the Company:

- (a) The Company (the holder of the Environmental Consent) must request, within 6 months after the conclusion of the privatization agreement, the authorization for the privatized unit in accordance with the Environmental Protection Law as amended. It is noteworthy that the annexes of the Environmental Consents for Turceni power plant and Dragotesti/Tehomir mine provide for the obligation to obtain an Integrated Environmental Authorization.
- (b) When applying for the Environmental Authorization as mentioned above, the Company will inform the Environmental Protection Agency GoR, in writing, in relation to the obligations of the parties under the sale-purchase agreement (privatization agreement) regarding the fulfillment of the obligations under the compliance schedule, and those regarding the indemnifications for the environmental damages caused through previous activities.

Every Environmental Consent has an annex attached comprising the environmental obligations of the Company to be taken into consideration in the privatization process. The contents of the annexes are presented in the Chapter 9 – Environment.



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## ENVIRONMENTAL PROTECTION MEASURES

### Measures Regarding the Emissions of Pollutants into the Air:

A notice from the Ministry of Environment and Water Administration addressed to the Company regarding certain measures to be taken in relation to the emissions of pollutants into the air at the thermal power plant of Turceni - the address no. 1789 - intervened upon the completion of the negotiations for Romania's accession to the European Union with respect to Chapter 22 - ENVIRONMENT and to the compliance with the provisions of the Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants, respectively. This Directive has been transposed into the Romanian legislation through the Government Decision No. 541 of May 17, 2003 on the establishing of certain measures for the limitation of emissions into the air of certain pollutants from large combustion plants ("GD 541"). According to the mentioned address, the Company undertook to comply with the pollutants' (SO<sub>2</sub> and powders) Emission Limit Values (*Valori Limita de Emisie*) ("VLE") established through the GD 541. The pollutants emissions refer to the Energetic Blocks 3, 4, 5 and 6. The deadlines are established for December 31, 2010, except for the emissions of dust at the Energetic Blocks 5 and 6, where the deadlines are established for 31 December 2007. It is provided that failure to comply with the above-mentioned obligations will trigger corrective measure to be taken by the competent authorities, including suspension of the activity and closing of the respective large burning installation. The details are presented in Chapter 8 – Environment.

Pursuant to the Article 5 of the GD 541, large combustion plants that do not comply with certain conditions settled by this decision (e.g. compliance with the VLE, including into the national programme for the limitation of certain emissions of pollutants) can be exempt from the functioning prohibition if the titleholder of the activity undertakes, through a written notification addressed, until June 30, 2004, to the competent public authority for environment protection, not to exploit the installation more than 20,000 hours during the period January 1,– December 31, 2015.

In accordance with these provisions, through a notification dated December 28, 2004, upon the request of the Ministry of Environment and Water Administration, the Company undertook not to use the Energetic Block 7 for more than 20,000 h during the period January 1, 2008 –December 31, 2015, to provide an annual report on the evidence of the operational hours during the above-mentioned period and also to definitively close the activity of this installation once this period expired.

Pursuant to the information provided by the TEC management the estimated total value of the investments representing measures for the limitation of pollutants emissions into the air, for the Energetic Blocks 3, 4, 5 and 6, is EUR 324.5 mil. The figures of this notice are described in detail in Chapter 8 – Environment.

### Measures regarding the Landfill of Waste:

The Company owns two ash and slag landfills, as follows:

- (i) Ash and slag landfill No. 1 Valea Ceplea, area of 250 ha, total capacity of 25 mil. m<sup>3</sup>, current remaining capacity cca. 13 mil. m<sup>3</sup>.
- (ii) Ash and slag landfill No. 2, having four cells. The cells No. 1, 2 and 3 have been withdrawn from production in 1997 being completely filled. The cell No. 4 is a reserve landfill in case of failure of the landfill No. 1 Valea Ceplea.

A notice has been addressed to the Ministry of Environment and Water Administration, regarding the justification of a request for a 6-year transition period for the ash and slag landfill No.1 Valea Ceplea in relation to the provisions of the EU Directive 1999/31/EC on the landfill of waste. The notice provides that the liquid waste depositing will cease until 2012.



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According to the mentioned notice, the costs for the application of the new technologies to be implemented until 2012 are of EUR 100 mil. At the same time, pursuant to the information provided by the management, the value of the investments to be carried out at the ash and slag landfill No. 2 is of EUR 20 mil.

### **Measures Regarding Water Pollution:**

Pursuant to the information provided by the management, the analysis reports reveal that during the summer the waters overflowed at Turceni power plant have a temperature exceeding the maximum ceiling – i.e. 35°C. This is due to the fact that 40 km upstream Turceni power plant is located the Rovinari power plant, so that the waters drawn in by the Company already have a high temperature.

Pursuant to the information provided by the management, the costs of the measures to be taken in order to comply with the overflowed waters limit temperatures are of EUR 3.6 mil.

### **ENVIRONMENTAL DISPUTES, CLAIMS, ETC.**

Pursuant to the management, there are no disputes, complaints, claims, accusations, allegations, causes of action or demands against the Company or any of their officers related to environmental matters. Furthermore, the Company was not subject to enforcement proceedings with any environmental regulatory agency or authority.

None of the four environmental inspection reports performed by the Environment Protection Inspectorate Tg.-Jiu (*Inspectoratul de Protectia Mediului Tg.-Jiu*) at Electrocentrale Turceni S.A. in 2003 established a sanction for this company. At the same time, pursuant to the representations of the management, there are no disputes or claims related to the environmental protection concerning the mining exploitation Jilt, no compensations had been paid in the last five years in relation to an environmental damage, and no accidents or incidents having a potential impact on the environment occurred in the last five years in relation to the mentioned mining exploitation.

### **CONTRIBUTIONS TO THE ENVIRONMENTAL FUND**

Pursuant to information from the management, the Company pays contributions to the Environmental Fund for the emissions of polluting substances into the atmosphere. The Company's arrears in paying such contribution that reached ROL 20,389,279,190 in September 2004, have been paid, including the contribution for November 2004.

### **MISCELLANEOUS**

The data room comprises a copy of the Integrated Environmental Permit No. GJ-6 of March 1, 2004 on the clearing of a forest area of 18.8 ha. The permit is valid for two years from the issuance date, until March 1, 2006, respectively. The cleared surface will be used for depositing the *sterile* resulted from the Mining Exploitation Jilt – Jilț Sud mine.



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## 11.0. MANAGEMENT AND EMPLOYEES

### 11.1. Organizational Structure

Turceni Energy Complex (TEC, Turceni Complex), merged the activities of the power producer Electrocentrale Turceni with the mining activities of EMC Jilt and EMS Dragotesti, previously acting as subsidiaries of the Lignite National Company Oltenia (CNLO), also including their railway transport facilities. The Company's head office was established in Turceni. The Complex management structure consists of:

- General Meeting of Shareholders
- Board of Administration (Board of Directors)
- General Director, and
- Executive Directors

The organizational structure of TEC was designed for a number of 4,206 positions (jobs). The personnel is organized in five divisions, each led by a Division Director and divided in departments and another 14 independent departments directly subordinated to the General Director.

The Head Office sets and coordinates the implementation of the Company's strategy and policies, monitors the activity within this strategy and assesses the performance against the planned objectives. It is the central point of communication with the relevant authorities and third parties, both internally and at the international level.

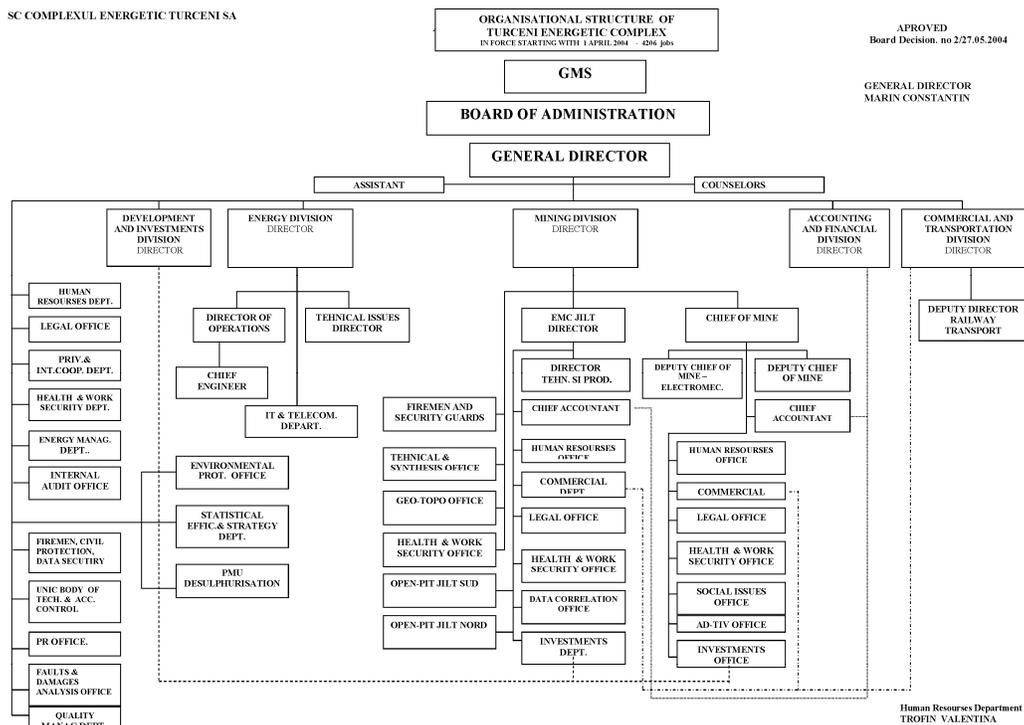
The structure at the Head Office level has correspondent departments at the energy and mining divisions' level. Direct cooperation is envisaged between the head office structures and the correspondent departments within the energy and the mining divisions. According to MEC decision, a new internal audit department was established at the Turceni Complex level. A Project Management Unit (PMU) dealing with desulphurisation plants for the power generation units was also established, as a distinct structure under the general director's coordination.

The laboratories at the mines' headquarters were eliminated and a single laboratory for the coal parameters' analysis remained within Turceni TPP.

The organizational structure of TEC is shown in the following figure.



Figure 11.1: Organizational chart of TEC



GENERAL MEETING OF SHAREHOLDERS (“GMS”)

The GMS is the highest management body of Turceni Energy Complex (TEC), deciding on issues concerning the Company’s general activity and on its economic and business policy. The GMS may assemble in Ordinary or Extraordinary Meetings. The state interests for the period when it is the sole shareholder of the TEC is the Ministry of Economy and Commerce which is responsible for appointing and discharging the GMS members through a Minister’s Order.

Based on the special provisions of the GD no. 103/29.01.2004, the first representatives in the GMS were appointed through MEC Order no. 3024 issued on 08.03.2004.

BOARD OF ADMINISTRATION (BOARD OF DIRECTORS)

TEC is managed by the Board of Administration (Board of Directors), which comprises five members of which one is the general director of the Complex. The Board members are appointed and discharged by the GMS based on the mandate issued by Minister of Economy and Commerce. They are appointed for a period of maximum 4 years. The Board of Administration meets at least once per month at the Chairman’s call or at the call of one third of the Board members. The Board’s decisions validity is assured by the participation of at least half of the members and by the vote of a simple majority of the participants. In the Board meetings discussing on social and human resources issues, the trade union’s representative may participate but without a voting right.

The Board of Administration (Board of Directors) may delegate part of its responsibilities to the General Manager of TEC. The current Board of Administration (Board of Directors) was appointed according to the Order of Minister of Economy and Commerce no. 3025/08.03.2004, in the first constitutive General Meeting of the Shareholders held on March 25, 2004. It comprises five members, including the Chairman,



who is also the General Manager of TEC. The other appointed Board members are from MEC (two members), from the market operator OPCOM (one member) and from Termoelectrica (one member).

The main responsibilities of the Board of Administration (Board of Directors) are listed in TEC by-laws and in the Annex II of the GD no. 103/2004.

#### **INTERNAL AUDITORS**

The administration activities of the company are controlled by the shareholders and by three auditors) appointed by the GMS. The bylaws states that as long as the state will continue to own more than 20% of the share capital of Turceni Energy Complex, one of the auditors will be recommended by the Ministry of Public Finance. All the internal auditors appointed through GAS resolution No. 1 of March 2004wer certified chartered accountant. All the internal auditors appointed through GAS resolution No. 1 of March 2004wer certified chartered accountants. .

According to the Order 94 issued by the Minister of Public Finance on 29 January 2001 regarding the implementation of the relevant EU Directives and of the International Accounting Standards, as further amended, the Company must hire financial auditors (according to Article 3(2)). At the end of the financial year 2004 such companies are obliged to comply with the legal provisions regarding the internal audit if they fulfil at least two of the following requirements: (i) a turnover of at least EUR 7.3 million per year, (ii) an aggregate value of the assets for the past year of more than EUR 3.65 million, and (iii) an average number of employees of at least 50.

As the Company meets the above-mentioned criteria for 2004, it was obliged to hire the services of financial audit (KPMG Romania was appointed) and to organise the internal audit activity. Thus, the Internal Audit Committee shall be replaced with the financial auditors. According to the GMS resolution no. 1 of 25 March 2004, the auditors' remuneration was set to 20% of the General Manager's gross salary. According to the GMS resolution no. 6 of 1 October 2004 the General Manager's gross salary is of ROL 54,993,170 around USD 1,900 at current exchange rate). The gross salary covers both basic salary and benefits. No evidence of increasing the General Manager's salary has been provided.

The General Director is the legal representative of the Company and was also appointed as Chairman of the Board of Administration (Decision no. 1 of the GMS, issued based on the Order of Economy and Commerce Minister no. 3025/08.03.2004). His main responsibilities are listed in the Company's by-laws.

#### **DIVISIONAL DIRECTORS (EXECUTIVE DIRECTORS)**

There are five Divisional Directors all of them reporting directly to the General Director:

- Director of the Energy Division, in charge with coordinating the power generation specific activities
- Director of Mining Division, who coordinates the activity of Jilt and Dragotesti exploitations
- Development and Investments' Director, in charge with coordinating the activities related to modernization and rehabilitation, implementation of the approved investment plans for energy, mining and transportation as well as the administration of investment related loans and procurement
- Director of Commercial Division, in charge with coordinating the activities related to purchasing, sales and transport. He is responsible for the railway transportation and has a deputy director coordinating this activity
- Director of Accounting and Financial Division, who coordinates the accounting and financial bookkeeping and reporting, including salaries.

As stipulated in the Annex 1 to the Protocol concluded with CNLO, according to the GD no. 103/2004, the existing personnel of EMC Jilt and EMS Dragotesti and some specialists from CNLO were transferred



to the newly established TEC, by joining the staff of Electrocentrale Turceni. The salaries' budget corresponding to the number of 2,854 employees taken over from CNLO was also transferred to TEC.

## 11.2. Staff Composition

### POWER GENERATION UNIT - ELECTROCENTRALE TURCENI (TPP TURCENI)

The headcount of TPP Turceni at 31 December 2003 was of 1,313, as compared to 2420 employees at 1 January 2003 (the moment when TPP Turceni was set up as a commercial company). The personnel are recruited from Turceni and the neighbouring localities up to 70 km away from the Company's headquarters with most from the cities of Filiasi and Craiova..

The average employee age in the Company is of 39 years of which workers 38 years, foremen 44 years and 42 years for technical-administrative personnel. The average length of service of the Company's employees was of 19 years and the average length of service with the Company was of 16 years, at 31 December 2003.

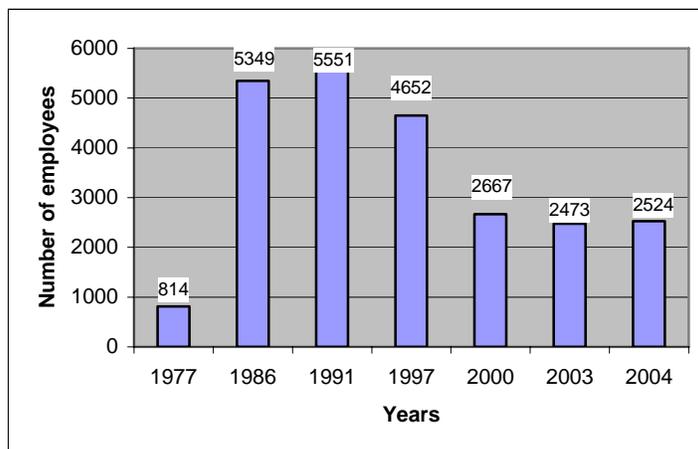
From the total of 1,313 employees, workers account for 997 (76%), while 158 employees (about 12% of the total employment), within the technical-administrative category (TESA), have a university degree. During the year 2003 the total number of employees was reduced by 1,111 persons of whom 911 employees left the company in the process of outsourcing the maintenance activities to the newly established service company Termoserv Turceni and 200 employees were made redundant and were subject to a collective layoff. For its activities TPP Turceni employs only full-time personnel.

### EMC JILT

The headcount at 31 December 2003 was of 2,473 employees out of which 115 employees work in the railway transportation sector.

The dynamics of the number of employees at Jilt lignite exploitations is shown in the following figure:

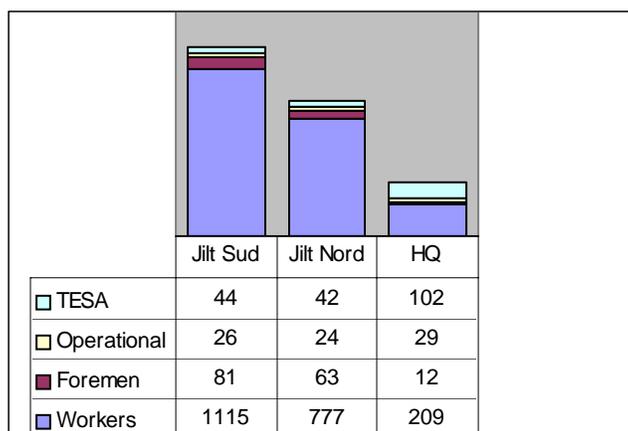
**Figure 11.2: Number of EMC Jilt Employees 1997-2004**



The personnel is recruited mainly from Matasari, where the open-mines' headquarters is located, and from many of the neighbouring localities, up to 60 km distance, such as Targu Jiu, Dragotesti, Slivilesti and Motru. From the total of 2,473 employees, 84% are workers and 10% technical and administrative personnel; 88% of the employees are high school graduates, 10% have a university degree and 2% are low-skilled labourers.



**Figure 11.3: Jilt's Employees by Classification**



The activity is organised in three shifts and the employees' distribution on shifts is the following:

**Table 11.1: Employees by Shifts**

	Jilt Sud	Jilt Nord	CFU	HQ	TOTAL
Shift I	639	443	60	158	1300
Shift II	305	218	28	36	587
Shift III	304	219	27	36	586

### EMS DRAGOTESTI

The headcount was of 375 at 31 December 2003 and of 351 at 30 April 2004 (after the absorption within CET Turceni). We anticipate EMS Dragotesti will be closed prior to privatisation of TEC and all employees will be re-allocated to other places or retired.

### 11.3. Salaries and Other Personnel Expenses

#### ELECTROCENTRALE TURCENI

The annual budget for the personnel expenses of Electrocentrale Turceni is derived from the annual salaries fund (employees' base salary and additional payments as stated by the Collective Labour Bargaining Agreement) that is based on the estimated average gross income per employee and on the number of full-time employees. The GMS and the Ministry of Economy and Commerce shall approve it. The total salaries in 2003 are showed in the table below:

**Table 11.2: Annual salaries fund in 2003, ROL million**

Annual salaries fund (without General Director, Board and GMS members' remuneration), of which:	Base Salaries, Total	Additional payments included in the gross income, Total
312,446	202,215	102,156



In 2003 the TPP Turceni personnel expenses amounted to ROL 494.8 billion. The ratio of salary related taxes and contributions to total salaries and other benefits were of 33 % in 2003.

In the same period, the monthly average cost of salaries per employee was of ROL 21,992,180.

### EMC JILT

In 2003 the company registered a salary fund of ROL 394.923 billion and additional labor expenses of ROL 66.202 billion. , The balance, up to ROL 1008.591 billion, being represented by the payroll taxes and contributions related to the salaries paid by the company (pensions, unemployment, health, social protection). The employers' contributions represents 24.68% of total personnel expenses. The base salaries represent 67% of the salaries' fund while additional payments are of 33%.

## 11.4. Employment Policy and Conditions

The employment policies and terms are governed by the Collective Labour Bargaining Agreement ("CLBA"). The CLBA is concluded according to Law no. 130/1996. Specific provisions of the two existing CLBAs applicable to the TEC employees, separately for the personnel working in the energy and in the mining industry, respectively, are summarised in the sections below:

### ELECTROCENTRALE TURCENI

The latest CLBA applicable to TPP Turceni was signed on 20 December 2002 for a period of five years and enforced for all the entities acting at that time within Termoelectrica S.A. A Common Note was concluded on February 2003 at Electrocentrale Turceni between the Company's Administration and Energia Turceni Union emphasizing some special provisions for the period 01.01. - 31.12.2003 that are in line with Termoelectrica's CLBA. The CLBA was amended with the provisions in the new Labour Code through the Additional Act No. 1722/03.03.2003 and the Common Note also was subject of some adjustments through Additional Acts in May and September.

The employees' compensation includes base salary and various additional payments and facilities. Individual base salaries are negotiated within the limits of the remuneration grid in the CLBA.

According to the CLBA the minimum monthly salary is revised every six months but it cannot be lower than the ROL equivalent of EUR 100. During 2003 the average gross salary in TPP Turceni was as in the table below.

**Table 11.3: Average salary for TPP Turceni Employees**

Personnel category	No. of personnel	Monthly Average Gross Salary	
		ROL	Euro
Total	1,313	16,736,005	446
Workers	997	15,622,643	416
Foremen	76	22,860,257	609
TESA, of which:	240	19,473,310	519
university graduate	155	22,223,341	592



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## **BENEFITS AND ADDITIONAL PAYMENTS**

The system of benefits for TPP Turceni personnel includes the following:

- Bonus for the length of service;
- Bonus for the continuity of activity within the Company;
- Bonus for working in the night shift;
- Bonus for systematically working over the normal working program;
- Bonus for working on Saturdays, Sundays and Professional Day
- Bonus for working on legal holydays (Christmas, Easter, Labour Day).

These bonuses are awarded based on the criteria and conditions stipulated in the Internal Regulation of Electrocentrale Turceni SA, according to the applicable legislation. As mentioned in the CLBA, the salaries' fund is established based on the performance criteria on specific activities set up by Termoelectrica and agreed with the unions. As an incentive instrument for the employees' performance, the company maintains and uses a special bonus fund representing 10% of the salary fund. As granted by law, the employees are entitled to participate to the company's net profit registered by the company at the financial year-end.

In order to attract highly qualified personnel, TPP Turceni offers a relocation bonus to the newly hired specialists living in other localities. Other additional payments that the employees of TPP Turceni are entitled to include:

- Bonus for 20, 30 and 35 years of activity with the company;
- Year-end fix amount, within the limits of the approved budget.
- 75% of the transportation cost for the employees living outside Turceni (around 1,000 people).

Various other facilities related to social issues, work and health protection, professional training, insurance etc., add to the above-mentioned benefits and additional payments. Law 84/1995 establishes the professional training rules and responsibilities. According to the company's need and to the legal provisions, in 2003 TPP Turceni has spent over ROL 726 million for the personnel training.

Chapter II of the CLBA defines the work and rest time. The normal duration of work is 8 hours a day, 40 hours a week, 5 days per week. In special circumstances, where the normal work program is not suitable due to specific requirements, the work program is organized in continuous shifts, turns or season programs. Employees are entitled to an annual paid leave of minimum 21 workdays which is increased by additional days according to the employees' length of service:

- 3-5 years: 1 day
- 5-10 years: 2 days
- 10-15 years: 3 days
- 15-20 years: 5 days
- over 20 years: 7 days

## **EMPLOYMENT POLICY AND CONDITIONS FOR EMC JILT AND EMS DRAGOTESTI**

According to the CLBA of the mining sector and geology, the minimum salary is 1.5 times the minimum salary at the country level, established by law. The base salary grid detailed by activities, work places, professions and positions for mining (open and underground) and mining-associated activities including the internal railways exploitation, is part of the CLBA approved at CNLO level. The gross salary for open



pit miners includes: the base salary (as established by the salary grid annexed to the CLBA), the benefit for the length of service, benefit for dangerous work; benefit for working in the night shift. The average monthly gross salary registered in 2003 at EMC Jilt was of ROL 13,106,422.

In addition to the above-mentioned components of the gross salary, the EMS employees also receive a 5% of the base salary as a benefit for underground working place. In 2003, the monthly average gross salary at EMC Jilt and EMS Dragotesti, respectively, per main classes of employees is showed in the table below:

**Table 11.4: 2003 Monthly Average Gross Salary at EMC Jilt L**

	EMC Jilt
Workers	12,334,052
Foremen	17,534,976
TESA	19,098,674

A new CLBA for the period 2004-2007 at the mining and geology sector level was approved on 6 January 2004 (no. 5464/20). Based on the sector-level agreement, CNLO negotiated with the Mining Unions Oltenia (USM Oltenia) the CLBA regulating the employer-employees relation for the entities within the Lignite National Company Oltenia. Three additional acts to the CNLO collective labour contract were signed in February and March 2004, of which the first is related to the compensatory payments in case of collective layoffs and the second refers to additional payments and bonuses for the employees.

#### **BENEFITS AND ADDITIONAL PAYMENTS**

To the benefits included in the gross salary, defined in the previous section, other benefits and additional payments are stipulated in the CLBA at CNLO level. They include:

- Bonus for working on Saturdays, Sundays, Professional Day and legal holidays;
- Bonus for systematically working over the normal working program;
- Holiday additional payment (for 2004 the amount is of 75% of the average gross salary at CNLO level);
- Additional payment on special occasions: Christmas, Easter, professional day (fix amount usually included in the salary fund: for 2004 only the Easter payment of ROL 3 million per employee was taken into consideration in the budgeted figure);
- Six paid holidays: New Year, Christmas, Easter, professional day (additionally paid although the respective holiday is included in the average working time of the respective month).

According to CLBA, Chapter II, the employees of CNLO have rights and benefits of which the most important are:

- Free transport to and from the working place
- Free-meal plan 1 or 2 (beneficiary of the free-meal plan 2 has to pay 25% of the meal price; this plan is not very much used because its value is taxed within the global income tax). There are discussions between the unions and the management to replace the free-meal plan 2 with meal tickets. After the Complex creation, in the summer-2004 this free-meal was replaced by meal-tickets (as for the employees in the energy field). This measure that was very well received by the employees supposed an additional financial effort of ROL 4 bn at Turceni Complex level
- Free of charge 8 tones of coal per year for miners and 6 tones per year for the other employees.



A special bonus fund of 1% of the total salary fund is retained at each subsidiary, by subtracting this amount from the total salary fund before starting the salary negotiation. The management uses it as an additional fund for stimulating individual performance of the employees.

The vacation time is stipulated in the Section II of the CLBA and includes an annual paid period according to the length of service and an additional number of paid days according to the position and the working place. The minimum rest time is of 24 working days per year. Annexes 22 and 17 to the CLBA contain in detail the number of rest days for each category of employees. The total length of service will be increased with 6 months for each year worked in the open-pit or underground mine.

A number of other paid leaves (2-5 days) are mentioned in the CLBA for weddings, death of relatives, birth of children etc. The labour contract is also regulating the stand-by period of an employee which is defined as a period of up to two years in which the employee may wait for receiving another job within the company or to be transferred to another company or to retire. For this stand-by period the employee receives 50-70% of the base salary plus the benefit for length of service. During the stand-by period the employee should participate to special development programmes as required by the employer; employees' refusal will have as a consequence losing the allocation.

In exceptional situations when technical reasons, major incidents, natural calamities or other similar situations make impossible the activity of the company, the employees receive 75% of the salary for a maximum of three days period.

## PENSIONS

The pension system in Romania is regulated by Law no 19/2000. The right to social protection is guaranteed by the state, and is exerted through the public system of pensions and other social security rights. The employees can benefit from the pension for age-limit if they fulfil cumulatively the following criteria (art. 41):

- Standard retirement age for pension: 60 years for women and 65 for men
- Minimum contribution period: 15 years for both men and women
- The full contribution period is set at 30 years for women and 35 years for men.

New legislative initiatives regarding the private pension systems are currently under the Parliament debate. The first law on optional pension system, Law 249/09.06.2004, was promulgated in June 2004 and will be put in force starting 2005. Another law on mandatory private pensions is under debate and will probably be enforced after January 2007.

Under these circumstances none of the TEC entities provided any private pension scheme to its employees. As stated in the CLBA for the **energy sector**, applicable to Electrocentrale Turceni, with any cause for retirement, TPP Turceni offers to all employees upon retirement special benefits including:

- One-time payment upon the retirement, which is depending on length of employment in the industry (Termoelectrica, former Renel, Conel or Ministry of Energy):
  - Less than 10 years – 1 gross monthly salary;
  - Between 10 and 25 years – 2 gross monthly salaries;
  - Over 25 years – 3 gross monthly salaries.
- Annual social support established by the joint Management-Unions Commission for all the employees that worked in the Company a minimum of 15 years of their total length of service or the last 10 years before retirement;



- Special social support, that may be approved only once a year, for the retired employees with medically proved illnesses or for those losing any other support from their families;
- In the mining activity, due to the special working conditions, the limit-age is reduced as stipulated in the art. 42 of the Law 19/2000.

The CLBA no. 16/19.02.2004, **for the mining sector**, applicable to EMC Jilt and EMS Dragotesti stipulates that the employees of minimum 45 years old cumulating 20 years of service length may also retire in the conditions stated by the art. 43 of the Law 19/2000.

The employees that retire at the age-limit basis receive an indemnification equal to six monthly base salaries in the last active month before retirement and the cash equivalent of two tones of coal. In terms of personnel, CNLO's policy that affected both EMC Jilt and EMS Dragotesti, was to concentrate the aged personnel in mines with an estimated shorter period of life and reorient the younger employees to the quarries/ mines with large reserves and long life expectations. As a result of this policy applied by CNLO, in the last years EMS Dragotesti has received the older employees from Motru mining exploitation (persons with about five years until the limit-age for retirement) while transferring to EMC Jilt the younger employees.

In the year 2003, EMC Jilt has spent ROL 655.8 million for the personnel training including professional training courses for employees, management training and graduate M. Sc. degree.

## 11.5. Redundancy and Work Termination Issues

### ELECTROCENTRALE TURCENI

The Additional Act signed on March 2003 modifies the articles in the CLBA related to the layoff procedure as regulated by the New Labor Code. According to the amended CLBA, the collective layoff should follow a special procedure starting with the notification of the unions with 60-120 calendar days in advance, depending on the depth of the Company's restructuring process.

The only collective layoff at the Company since its establishment as legal person took place in May 2003, when 200 employees were made redundant. Severance payments were done according to art. 4.108 of CLBA, amended by Additional Act 1722/03.03.2003 which stipulates the following:

- 7 base salaries for employees with a length of service between 6 months and 5 years
- 8 base salaries for employees with a length of service between 5 and 10 years
- 14 base salaries for employees with a length of service between 10 and 20 years
- 16 base salaries for employees with a length of service higher than 20 years.

Total severance payments amounted to ROL 58,736 million, as long as 158 employees among the redundant personnel had more than 20 years length of service and another 40 had a length of service between 10 and 20 years.

### EMC JILT

As a result to the programmes of personnel reduction at the CNLO's level, EMC Jilt had annual collective layoffs in the last three years and registered costs for the paid compensations as follows:

- 2002 – 112 employees were made redundant and the costs incurred by the compensatory payments were of ROL 20,170 million
- 2003 – 127 employees were subject to early retirement and forced redundancy with associated costs of ROL 19,285 million



- 2004 – 49 employees have left the company and the total cost of compensations was of ROL 7,530 million.

## 11.6. Employee and Trade Union Relations

The activity of trade unions in Romania is regulated by Law no. 54/24.01.2003. In TEC currently six independent unions are active of which one is active in the energy sector and four are active in the mining sector (EMC Jilts).

### POWER SECTOR

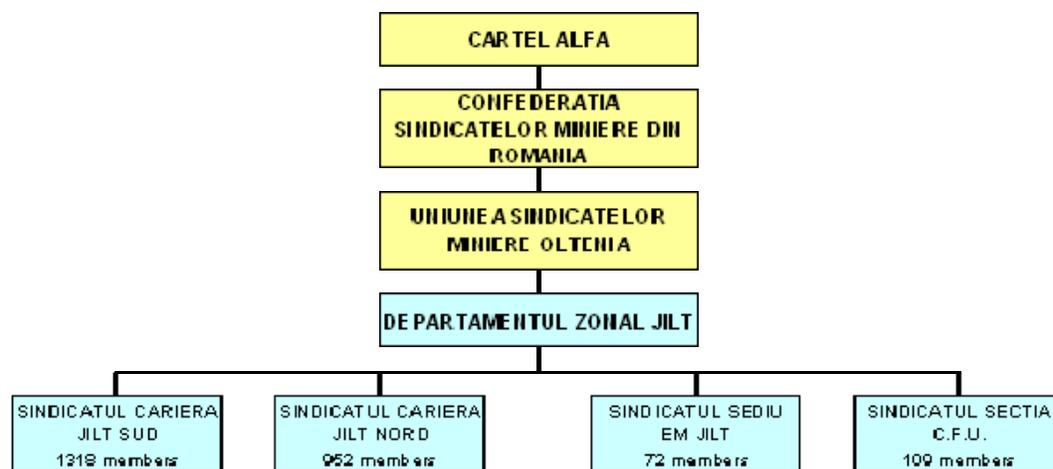
In TPP Turceni a single independent union named Sindicatul Energia Turceni was (and still is) active with a number of 2,211 members of which 1,307 are employees of Electrocentrale Turceni and 904 members are employees of the service company Termoserv Turceni SA. Sindicatul Energia Turceni is affiliated with the Federation Energetica Bucuresti, which in turn is affiliated with of the influential national-level Confederation Blocul National Sindical.

Each union member contributes to the union funds with 1% of his total income. This fund is managed by the Energia Turceni Union and used for financing the union’s events, for some material support to its members, for special allocations to the employees that are temporarily unable to work etc. A second fund, created through an allocation of 2% of the total salaries amount, is dedicated to socio-cultural expenses; it is annually planned and approved both by the company and the unions. According to the CLBA, in order to benefit of the advantages of the union’s membership, the employees who don’t have this status also pay a monthly fee of 1% of their gross salary. Management considers the relationship with the union as very good.. There were no disputes between the Company’s management and labour union in the past.

### MINING SECTOR

Four trade unions subordinated to Jilt Division are active in EMC Jilt. They are part of the Mining Unions Oltenia within the Romanian Mining Unions’ Confederation, affiliated to Cartel ALFA. The structure of the trade unions active in EMC Jilt and their affiliation is summarised in the figure below, which also indicate the number of members per each union. According to the company’s data, by end-June 2004, a number of 2427 employees were members of one of the four active unions while 84 employees have not union-membership status and do not pay any fee to the unions.

Figure 11.4: EMC Jilt Trade Unions



Note: Unions active in EMC Jilt are in blue.