SUMMARY SHEET
Rehabilitation and Modernisation of Power units 3 & 6 – Phase II Rehabilitation and Modernization of Power unit 3 Project from S.C. Complexul Energetic Turceni S.A.

1. General Information:
S.C. Complexul Energetic Turceni S.A.

1.1. Field of Activity:
- production of electricity and thermal power based on lignite
- extraction and preparation of lignite

1.2. Associations with other companies or participations in joint companies: not the case

1.3. Shareholdings Structure:
- Ministry of Economy, Commerce and Business Environment - 74,63%
- S.C. Fondul Proprietatea S.A. - 24,79 %.
- S.C. Termoelectrica S.A. - 0,58 %

1.4. Establishment: April 1st, 2004

2. Relevant Economic Data:
2.1. Equity Capital: 458,031,141.89 lei
2.2. Turnover (at 31.12.2010) : 1,042,573,570 lei

2.3. Production capacities and their use rate:
Complexul Energetic Turceni S.A. has 5x330 MW power units in operation.

<table>
<thead>
<tr>
<th>No.</th>
<th>Power Equipments</th>
<th>Installed power (MW)</th>
<th>Use rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power Unit No.1</td>
<td>330</td>
<td>15,4</td>
</tr>
<tr>
<td>2</td>
<td>Power Unit No.2</td>
<td>330</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Power Unit No.3</td>
<td>330</td>
<td>44,0</td>
</tr>
<tr>
<td>4</td>
<td>Power Unit No.4</td>
<td>330</td>
<td>63,5</td>
</tr>
<tr>
<td>5</td>
<td>Power Unit No.5</td>
<td>330</td>
<td>65,9</td>
</tr>
<tr>
<td>6</td>
<td>Power Unit No.6</td>
<td>330</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Power Unit No.7</td>
<td>330</td>
<td>35,9</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>45,1</td>
</tr>
</tbody>
</table>
3. Market (domestic, foreign):

Domestic customers. The sales are only on the domestic electricity markets, as follows:

- Regulated Market
- Day-Ahead Market
- Balancing Market
- Centralized Market of Bilateral Contracts

4. Provisions with raw materials and products:

The raw materials and the products are from the domestic market.

5. Recognitions from International Financing Organizations:

- European Bank for Reconstruction and Development – EBRD
- Black Sea Trade and Development Bank – BSTDB
- Japan International Cooperation Agency – JICA
- European Investment Bank – EIB
- KfW IMPEX Bank GmbH – Germania

6. Project Objective:

6.1. Description of the Investment Site and Utilities:

S.C. Complexul Energetic Turceni S.A. (CET) is a company which produces electric and thermal power, located in Turceni, Gorj County, Romania, on the right bank of river Jiu, at half of the distance between Craiova and Targu-Jiu city, with a total surface of 1293 ha. The access to the building is made from the county road 673. The site of the investment is located within Turceni Thermal Power Plant, a component of S.C. Complexul Energetic Turceni S.A.

Turceni Thermal Power Plant was built between 1978 - 1987 with Romanian technology under Rateau-Schneider license for the turbines and Babcock license for boilers. At present CET has an installed capacity of 1980 MW (6x330), being the biggest lignite energy producer in Romania and having the highest installed power. At the beginning the installed power was of 7x330=2130 MW, but unit no. 2 was disassembled as it exceeded the useful lifetime. Two of the 6 power units available (Units 4 and 5) have been rehabilitated and modernized under a complex program, becoming the highest performance lignite power units in Romania.

CET owns its own lignite mines:
- Jiț mining exploitation in Mătăsari village with a production capacity of 6000000 tones lignite/year with a calorific power Qi>1700 kcal/kg;
- Tehomir mining exploitation in Drăgotești with a production capacity of 400 000 tones lignite/year with a calorific power Qi>1900 kcal/kg

6.2. Project Description:

The rehabilitation of power unit no. 3 at CE Turceni is aimed to achieve the following objectives:

- To increase the Unit 3 availability for generation;
- To increase the Unit 3 lifetime by at least 15 years;
➢ To improve the technico-economic parameters of the Unit 3 by reducing the specific gross heat consumption among others;
➢ To improve the environmental conditions by reducing the emissions NOx, CO in compliance with the Romanian and EU norms in force;
➢ To implement a modern automation, adjustment and control systems that shall fulfill the UCTE technical requirements.

The rehabilitation / modernization works proposed to be achieved for power unit no. 3 consist of:
➢ rehabilitation and modernization of the thermo-mechanical technological systems,
➢ rehabilitation and modernization of the electric plants,
➢ rehabilitation and modernization of the automation and weak current plants.

The rehabilitation and modernization works will be also made within the coal settlement - phase I.

In order to comply with the laws regarding the environment protection (GD no. 440/2010), the following will be achieved:
- mounting of coal burners with reduced NOx;
- the electrostatic precipitators and the auxiliary plants to provide permitted of ash dust values will be replaced;
The main estimated running performances after achievement of rehabilitation and modernization works related to power unit no. 3 are the following:

For the steam boiler - Benson type, with forced draught and one gases path:
the boiler live steam flow rate 1035 t/h
the boiler live steam pressure 192 bar;
the boiler live steam temperature 540 °C
the boiler efficiency (guaranteed) 88,5 %

For the steam turbine - FIC type - 330, with condensation
the nominal electric power 330 MW
the maximum available electric power of duration
the live steam pressure at the entrance into the turbine 182,2 bar
the live steam temperature at the entrance into the turbine 535 °C

Regarding the power unit technical data after rehabilitation, these will be the following:
- The unit net specific heat consumption (medium duration) 2280,95kcal/kWh
- The cycle net global efficiency (medium duration) 37,7%
- Loading factor 75%
- Electric energy internal consumption 6,74%
- Fuel net specific consumption 325,85 gce/kWh
- Fuel gross specific consumption 303,89 gce/kWh

6.3. Studies, documents, analyses issued in respect of Project sustain

In order to execute this Project, there were accomplished the "Pre-Feasibility Study" and also the "Feasibility Study" by I.S.P.E. Bucuresti, both being further approved by the Approval Technical Committee of S.C.Complexul Energetic Turceni S.A., Economical and Technical Council, and also by the Board of Administration through Decision no. 5/13 August 2004 and the General Meeting of Shareholders of S.C. Complexul Energetic
Turceni S.A. through Decision no. 5/20 August 2004. 
By GD no. 2161 of 30 November 2004 was approved technical-economic items of the investment objective „Rehabilitation and Modernization of Power Units 3 and 6 from S.C. Complexul Energetic Turceni S.A.”, Gorj county. The approved investment value for both units, at prices available on 30 June 2004, was 15,077,753,090 thousand Lei (including VAT). 
On 31 August 2006, the total value of the investment objective was updated to 1,941,222,173 lei (including VAT) and on 31 December 2007 it was updated to 2,056,586,433 lei (including VAT). 

The total value of phase II – Rehabilitation and Modernization of power unit 3 investment (on prices valid at 31 December 2007) is 929,053,1 thousands lei (including VAT)

6.4. Forecasted period regarding Project achievement

The forecasted period regarding the Project achievement is 30 months, starting with 01 January 2016.

6.5. Romanian participation in Project achievement: design, constructions and mounting, utilities supply, equipments

The Contractor’s working points shall be provided with utilities (electric power, water, gas, etc.) by temporary connections of the existing networks in the working area. SC CE Turceni makes available workshops and working platforms for technological activities, warehouses, deposits and store platforms for equipment store and changing rooms and offices for social and administrative activities. A part of the equipment of the unit shall be reused.

6.6. External participation: financial, equipments, know-how, consultancy
- Financial – loans from international institutions, commercial banks, etc.
- Domestic and foreign equipment.

7. Project Estimated Value:

Financing estimated need for investment achievement:
TOTAL: 929,053.1 thousands lei (257,345.8 thousands Euro) out of which:
- Own sources: 30%
- Financing sources/ external sources - 70 %

8. Thermal Power Plant output and capitalization after Project achievement

Following the project achievement, the estimated power output is 1900 GW/year, its capitalization to be made on domestic energy market.

9. Environment Protection:

The works concerning the rehabilitation and modernization of unit 3 of 330 MW in CTE Turceni should comply with laws in force regarding the environment in our country:
- The Atmosphere Protection Law, no. 665/2001, that seeks the prevention, the elimination and the limitation of the damage as well as the improvement of the air quality in order to avoid negative effects on human health and the environment, ensuring alignment with international legal standards and EU regulations;
- The Law of Waters, no. 107/1996 with the changes and subsequent additions;
- Law no. 84/2006, with subsequent modification and completion, regarding pollution prevention, reduction and control.
- Government Decision no. 440/2010, establishing measures to reduce air emissions of certain pollutants from large combustion plants.

At present the burning gases from unit no. 3 is de-dusted with the help of the electrostatic precipitator and exhausted into the atmosphere through the enforced concrete stacks no. 2, common with unit no. 4. The dimensions of the existing stacks are: height \( H = 280 \) m and inner diameter at the top \( \varnothing = 8,8 \) m.

The 1035 t/h steam boiler of power unit no. 3 was built and commissioned before 1\textsuperscript{st} of January 1987, which means that it is considered type I big burning plants, according to GD no. 440/2010.

The Large Combustion Plants Directive (2001/80/EC) and the GD no. 440/2010 stipulate the following maximum values of the polluting substances in the burning gases for type I big burning plants, with a thermal power more than 500 MWt and using solid fuel (oxygen content in the burning gases of 6%):

- sulphur dioxide \hfill 400 mg/Nm\(^3\); *
- azote oxides \hfill 500 mg/Nm\(^3\);**
- ash powders \hfill 50 mg/Nm\(^3\).

*desulphurization efficiency > 94%.
** 200 mg/Nm\(^3\) starting with 1\textsuperscript{st} of January 2016.

Type I big burning plants should respect the limit values of polluting substance emissions till 1.01.2012.

In order to respect both the Romanian and the European legislation within the rehabilitation and modernization, the following have been stipulated:
- Mounting wet limestone desulphurization plants for SO2 emission reduction with the limits of 400 mg/Nm\(^3\); the works will be made within the investment "Mounting of burnt gases desulphurization plants at power units no. 3,4,5,6 at SC Complexul Energetic Turceni SA"
- Mounting the burning plants with azote oxides reduced formation so that starting with 1 January 2016 the NOx emission will be within the limits of 200 mg/Nm3;
- Rehabilitation of the existing electrostatic precipitators so that the ash powder emission should be 50 mg/Nm\(^3\).

The rehabilitation and modernization works for unit no 3 of 330 MW from Turceni Thermal Power Plant do not suppose change concerning the gross water flow rate taken from Jiu river in comparison to the existing situation.
10. Conclusions regarding the efficiency of Project implementation

10.1 Economic Effects

The advantages of the Project implementation consist of an increased availability with favorable effects on the electric power output at the requested parameters, a reduction of raw materials and products consumption and a reduction of repair and maintenance costs due to an increased reliability of plants.

<table>
<thead>
<tr>
<th>Technical Data after Rehabilitation</th>
</tr>
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<tbody>
<tr>
<td>Fuel gross average specific consumption (gcc/kWh)</td>
</tr>
<tr>
<td>Average power of duration (MW)</td>
</tr>
<tr>
<td>Average running period per unit (hours/year)</td>
</tr>
<tr>
<td>Electric power generated (GWh/year)</td>
</tr>
<tr>
<td>Electric power delivered (GWh/year)</td>
</tr>
<tr>
<td>Total fuel consumption (tcc/year), out of which:</td>
</tr>
<tr>
<td>- lignite (tcc/year)</td>
</tr>
<tr>
<td>- natural gas (tcc/year)</td>
</tr>
<tr>
<td>- heavy oil (tcc/year)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

10.2 Repayment period related to credits and sources:

Credits shall be for a period of 15 years with a grace period of 5 years and a repayment period of 10 years.

10.3 Recovery period related to invested funds (adjustment rate, period of adjusted recovery)

The recovery period related to the investment is 6.5 years.

10.4 Other efficiency information forecasted by Project implementation (adjustment rate, present net income, internal rate of return, profitability index)

<table>
<thead>
<tr>
<th>Adjustment rate (%)</th>
<th>10%</th>
<th>12%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present net income (thousand Euro)</td>
<td>116496.81</td>
<td>86368.98</td>
</tr>
<tr>
<td>Profitability index</td>
<td>1.191</td>
<td>1.184</td>
</tr>
</tbody>
</table>
11. Other relevant information related to the Project

According to GD no. 647/2001 regarding the approval of the National Energy Strategy on Medium Term, and according to GD no. 890/2003 regarding the approval of the “Road Map for Energy Sector in Romania” in order to be in line with the European Union standards, there is provided, among other, the need of rehabilitation and modernization of the power units from thermal power plants on lignite fire, respectively the ongoing operation of Turceni Thermal Power Plant with power units 3,4,5 and 6 rehabilitated and with the environment requirements being achieved.

The Romanian Energy Strategy for 2007-2020 and approved by GD no. 1069/2007 takes into consideration the provision of financing related to environment investment projects and rehabilitation/modernization projects from thermal power plants.

GENERAL MANAGER,
Laurențiu Octavian Graure