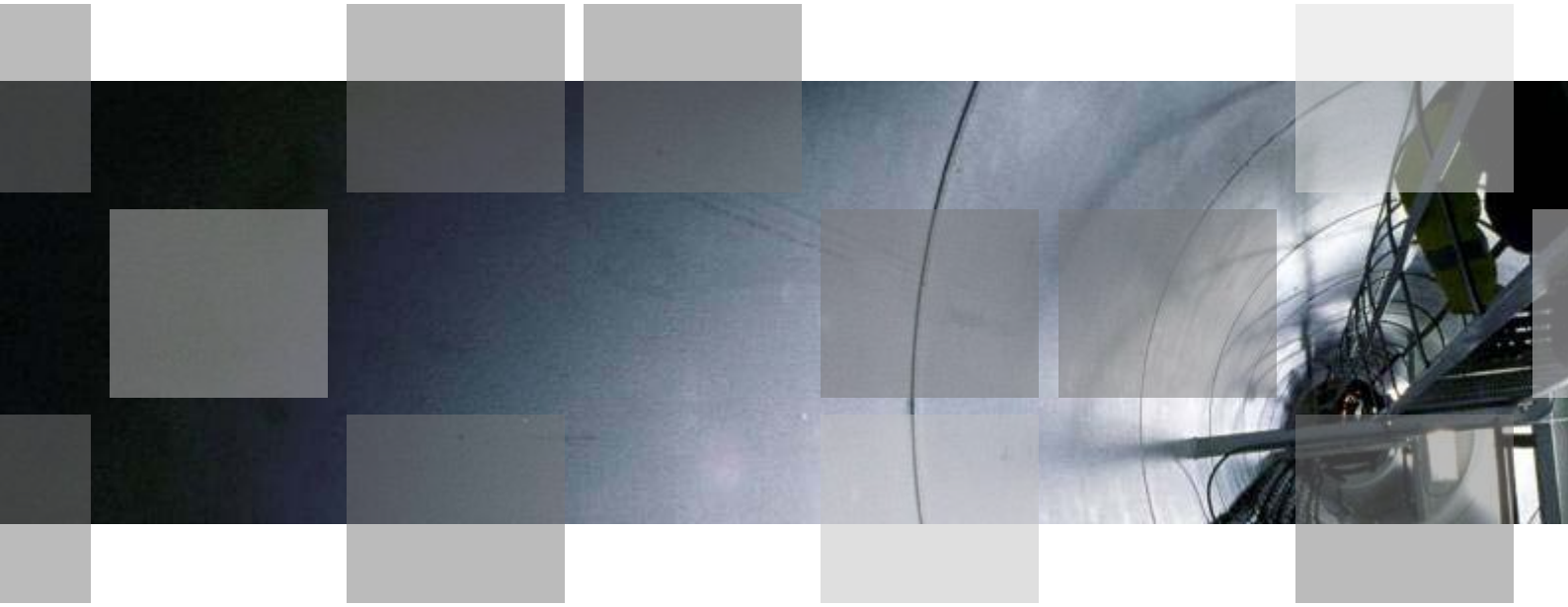
# NON-TECHNICAL SUMMARY

# PETROBRAZI 860MW COMBINED CYCLE POWER PROJECT

# ROMANIA



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# TABLE OF CONTENTS

**Figures**



**Tables**

# 1. INTRODUCTION

Petrom S.A (Petrom, BSE:SNP), part of the OMV Group, is the largest corporation in Romania, with primary activities focussed in oil and gas exploration and production, refining and marketing.

## 1.1. Project Outline

In 2007, Petrom announced its intentions to move into the Romanian power generation sector by developing an 860MW Gas-Fired Combined Cycle Power Plant (CCPP) at Petrobrazi Refinery (the Refinery), Brazi, Prahova County.

The regional location of the Refinery at Brazi is illustrated below.

**Figure 1: Regional Location of Petrobrazi Refinery**


In order to supply the CCPP with natural gas and also connect the CCPP to the Romanian national power transmission system (National Grid), a pipeline and 3km Overhead Line (OHL) Connection will also be installed.

The abovementioned three installations are collectively referred to as the Petrobrazi 860MW Combined Cycle Power Project (the Project).

### 1.1.1. Combined Cycle Power Plant


The main purpose of the Project is to generate power for sale on the National Grid and use by neighbouring Refinery.

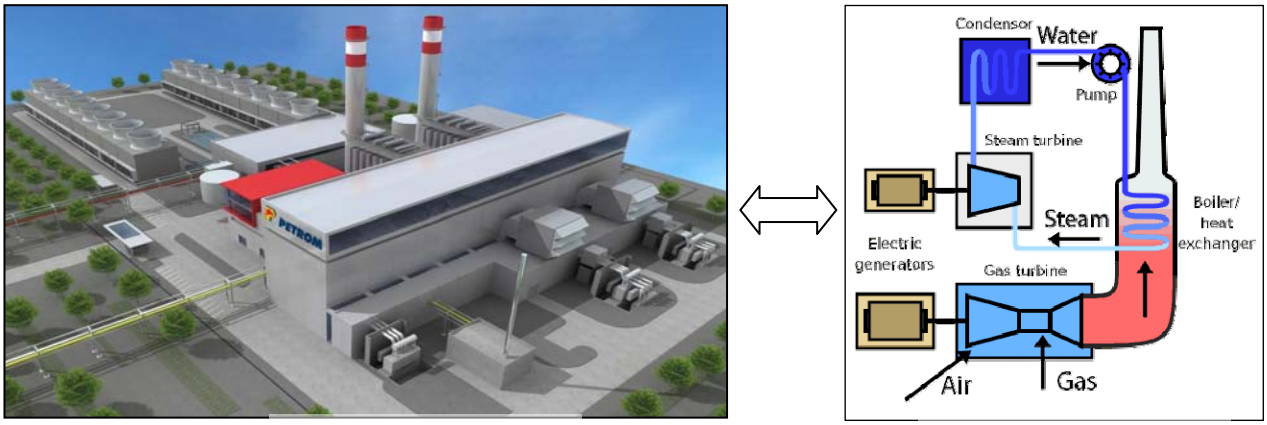
The CCPP will be constructed within the confines of the existing Refinery (*see right*) in Brazi Commune, Prahova County, and will generate approximately 6.7 TWh of energy.

The CCPP will be constructed for combined cycle operation, with the main combustion fuel consisting of natural gas which will be supplied via a pipeline from an off-site storage facility.

The combined cycle of the plant will be achieved through installation of two 310MW co-generation units (gas turbine with heat recovery steam generator) and one 305MW steam turbine. Natural gas will be burned in the gas turbines to generate electricity. The hot flue gases emitted from the gas turbines will then be routed to heat-recovery steam generators and used to produce steam that then powers a secondary steam generator for additional electricity production.

A conceptual model of the proposed plant and process to be used for power generation is illustrated below in Figure 2.

**Figure 2: Conceptual Illustration of the CCPP and Process**




Proposed Plant

Power generation process

Power generation at the CCPP will be of high availability (91% low factor) and high level of performance. The CCPP will achieve 57% net efficiency in condensing mode with excellent flexibility (55% net efficiency at half load) with total natural gas consumption of 1.2bcm/year.

The CCPP will be constructed on behalf of Petrom by an EPC (Engineer, Procure, Construct) Consortium comprising of General Electric (GE) and Metka. Operation and decommissioning of the plant will be carried out by Petrom's Power Division.

### 1.1.2. Natural Gas Pipeline

In order to provide natural gas to the CCPP for heat generation, a pipeline will be built to transport natural gas from an underground storage facility at Butimanu, Dambovita County, to the CCPP.

A feasibility study for the pipeline has recently been completed, however the pipeline routing and associated construction methods are still to be finalised.

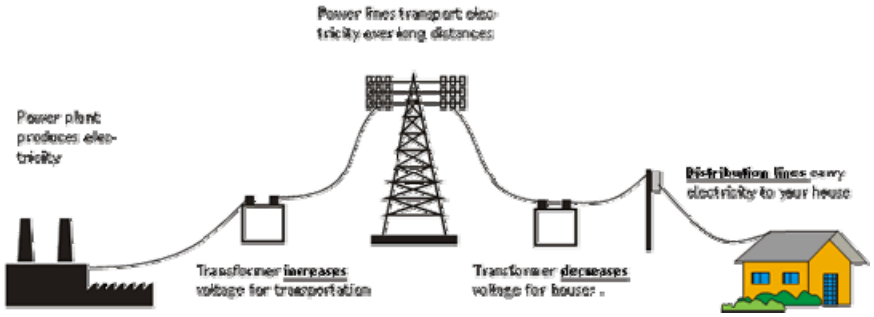
Construction, operation and decommissioning of the pipeline will be carried out by the Romanian national gas transmission network operator, Transgaz S.A (Transgaz).

### 1.1.3. Overhead Line (OHL) Connection

In order to facilitate transmission of power from the proposed CCPP onto the National Grid, an OHL Connection, will be constructed by Transelectrica from the proposed location of High Voltage (HV) switchgear at the CCPP to Brazi Vest substation where feeding of power onto the National Grid will take place.

The following conceptual model typifies the principles of installation of the OHL Connection linking the CCPP to Brazi Vest substation and National Grid so that power generated can be used across the country.

**Figure 3: OHL Connection Basics**




Connection of the CCPP to Brazi Vest substation to allow transmission of power onto the National Grid will require installation of the following components:

- HV switchgear (Swtichgear manufacturer – Siemens) at the CCPP (Lots 1);
- OHL Connection (Transmission equipment manufacturer – Siemens) (Lot 2); and
- Extension of Brazi Vest substation (Equipment manufacturers – Siemens/Toshiba) (Lots 3).

Construction, operation and decommissioning of the OHL Connection will be carried out by the Romanian national electricity transmission network operator, Transelectrica S.A (Transelectrica).

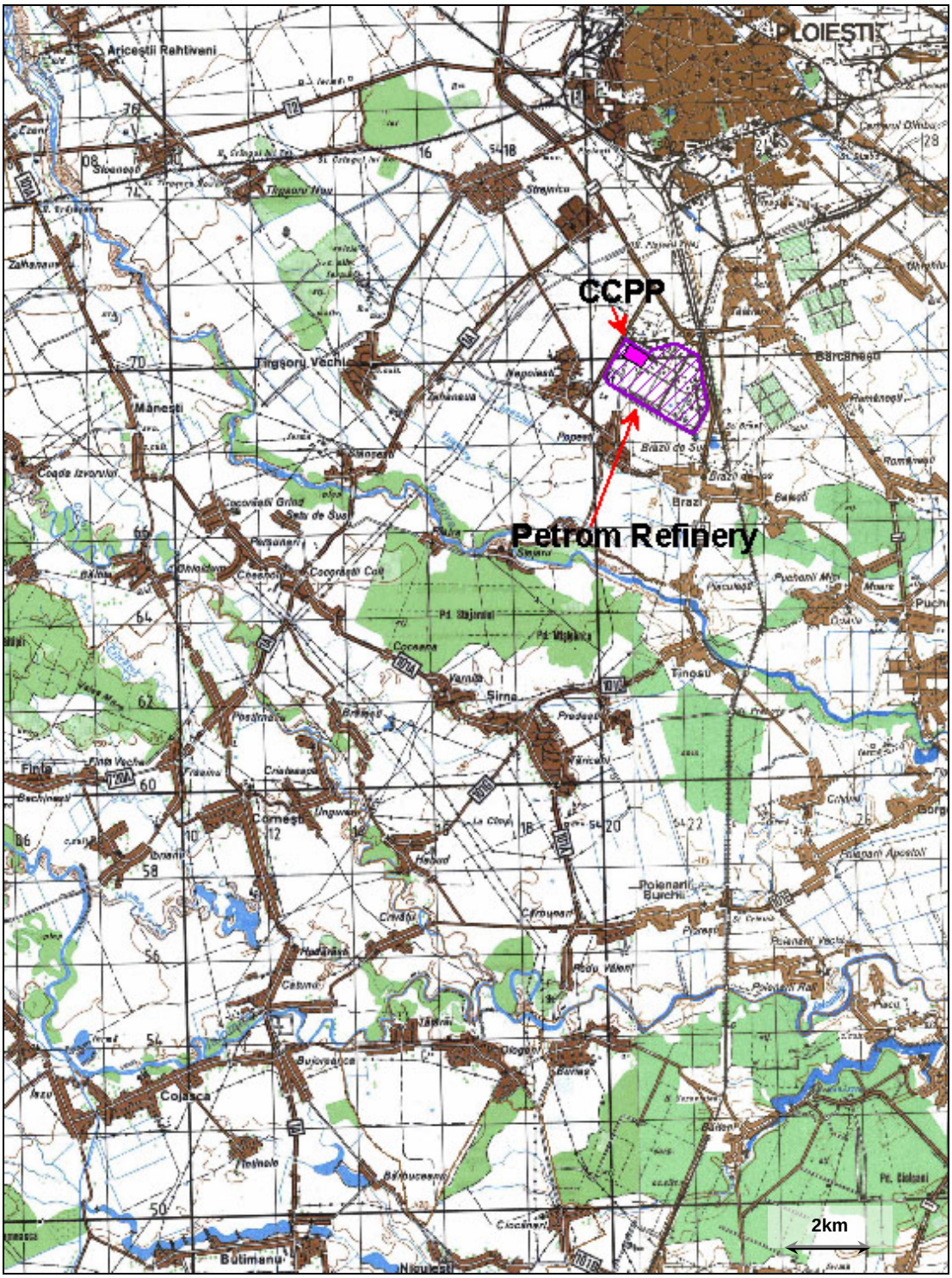
Table 1 below provides a summary of the various Project components.

**Table 1: Project Components – Summary**

| Component | Purpose | Features | Responsible Entity | | |
|---|---|---|---|---|---|
| | | | Construction | Operation | Decommissioning |
| CCPP within Petrobrazi Refinery | Power generation using natural gas | 860MW rating comprising of 2 gas turbines and 1 steam turbine. Energy produced 6.7 TWh. Natural gas usage 1.2bcm/year. Other ancillary works will involve installation of HV switchgears at CCPP. | EPC Consortium (GE/Metka) on behalf of Petrom | Petrom Power Division | Petrom Power Division |
| Pipeline between underground gas storage facility and CCPP | Provide natural gas as a combustion fuel to the CCPP | Still to be finalised | Transgaz | Transgaz | Transgaz |
| OHL Connection between CCPP and Brazi Vest substation | Transmission of power from the CCPP into the National Grid | OHL Connection comprising of 2 circuits (400kV and 220kV). Other ancillary works will involve extension of Brazi Vest substation. | Transelectrica | Transelectrica | Transelectrica |

Figure 4 below outlines the location of the Project.

**Figure 4: Local Setting of the Project**




## 1.2. Benefits

The currently installed generation capacity and efficiency of Romania's power plants is ageing, with the majority of existing thermal power plants having been in operation

since at least the mid-1980s. With a thermal efficiency of more than 57%, the proposed CCPP will be among the most efficient in Eastern Europe.

The CCPP will ensure a reliable and efficient power supply to the National Grid.

With state-of-the-art emissions reduction equipment, such as low $NO_x$ burners, the CCPP is designed following the highest technical standards and will fulfil the latest European environmental emissions requirements outlined in the Large Combustion Plant Directive.

Combined-cycle power generation provides cost-effective power production while saving energy and reducing global greenhouse-gas emissions.

Upon commissioning in 2011, the CCPP will generate approximately 8-9% of the power produced on the National Grid and supply the Refinery with industrial steam.

The pipeline and OHL Connection have been designed in accordance with Romanian technical specifications for gas/power transmission systems networks and their operation will result in negligible environmental impacts.

The socio-economic benefits of the Project are that it will provide a significant source of employment during the construction phase and will increase tax collection by the local, county and national government. CCPP development will take place on a brownfield site and will not require additional land acquisition.

## 1.3. Alternatives

The alternatives to combined-cycle power generation in terms of efficiency and Greenhouse Gases emitted for turbines of output >300MW are presented below in Table 2.

**Table 2: Power Generation Alternatives**

| Fuel | Efficiency (%) | $CO_2$ Emissions (g/kWh) | $SO_2$ Emissions ($mg/Nm^3$) | $NO_X$ Emissions ($mg/Nm^3$) |
|---|---|---|---|---|
| Combined Cycle Natural Gas | 54-58 | 360 | <35 | <50 |
| Oil | 36-40 | 740 | 50-150 | 50-100 |
| Coal | 54-58 | 700 | 20-200 | 50-150 |

# 2. ENVIRONMENTAL IMPACT PROCESS

Under the current Romanian regulatory framework, public and private projects to be implemented are to undergo review by Environmental Protection Agencies (EPA) in order to assess the potential associated environmental impacts. The Environmental Impact Assessment (EIA) process includes screening and scoping. Those projects deemed to have significant potential environmental impacts are required to undergo the full EIA process.

Under the EU EIA Directive, the CCPP (860MW) is subject to the full EIA procedure as it exceeds the heat output threshold of 300MW. As the OHL Connection (220/400kV, 3km) does not meet the thresholds for projects requiring EIA under the EIA Directive (OHL of ≥220kV and >15km), the Romanian authorities will determine whether they it is subject to EIA. Only upon finalising the routing of the pipeline will a decision be possible on whether it will be subject to EIA.

The permitting progress of the various components of the Project under the Romanian regulatory framework is outlined below in Figure 6.

**Figure 5: Romanian EIA Process**

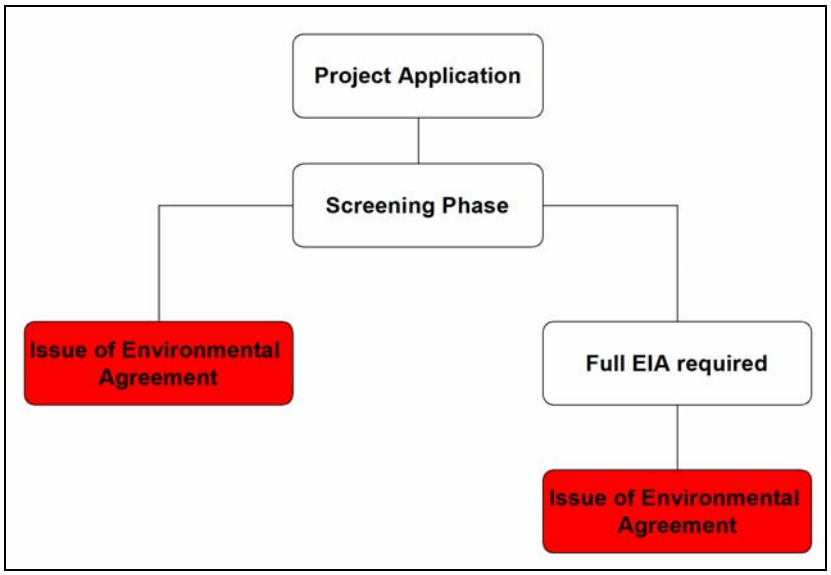



Table 3 below outlines the status of the various Project components in the permitting process

**Table 3: Project Component Permitting Status**

| Component | Requirement for EIA | Status Feb 2009 |
|---|---|---|
| Power Plant | EIA needed | Completed, construction permitted |
| Overhead power lines | No EIA needed | Construction permitted |
| Pipeline | Decision pending | Screening scheduled spring 2009. |

## 2.1. Public Relations and Information Disclosure

Petrom has developed a Stakeholder Engagement Plan (SEP) which summarises the consultation process and available grievance procedure which is in place. Details of the SEP can be found in the respective Chapter of this disclosure package, as well as with Mr Danut Alexandru Popescu, +40 (372) 8 66839, AlexandruDanut.popescu@petrom.com.

### 2.1.1. Combined Cycle Power Plant (CCPP)

Stakeholder Engagement and Information Disclosure as part of the Romanian EIA for the CCPP, completed in 2007, was carried out in accordance with the provisions of Romanian legislation. A summary of activities carried out is presented below in Table 4.

**Table 4: CCPP – Stakeholder Engagement Activities**

| Stakeholder Engagement Activity | Comments |
|---|---|
| Publication in newspaper on Decision of Technical Advisory Committee Meeting regarding the screening decision | "Informatia Prahovei", dated 23rd May 2007 |
| EIA Report disclosure for public comments | Prahova EPA, 4th September – 15th October 2007 |
| Public announcement of Public Hearing | Brazi Town Hall notice board on 4th September 2007 |
| Public hearing | Brazi Town Hall, 15th October 2007 |
| Publication in newspaper and at Prahova Environmental Protection Agency Headquarter on Decision of TAC Meeting regarding issue of the environmental agreement | "Informatia Prahovei", dated 12th November 2007<br>Prahova EPA notice board on 12th November 2007 |

In addition to the legal requirements, the Mayor's Office in Brazi also informed the public about the Project in an article published by the local 'InfoBrazi' newspaper (Anul III, No. 31, dated October 2007).

### 2.1.2. Natural Gas Pipeline

The routing of the pipeline has not been finalised. Initial screening of the pipeline project, upon finalising the route, will be carried out in Spring (March) 2009, after which a decision will be made on whether a full EIA with public consultation will be required.

In the event that the Romanian authorities decide that the pipeline project should undergo full EIA, stakeholder engagement and public consultation will be carried out involving publications in the media and public hearings.

### 2.1.3. Overhead Line (OHL) Connection

Approval of the OHL Connection project was obtained from LEPA of Prahova in January 2009. As stated in Romanian legislation, the streamlined approval (non-EIA) process involved the following public consultation:

- Advertisement detailing the project in the local/national media and posting of the details at the local council offices and on its website; and
- Outlining in the media/press the place and hours of consultation on the project.

# 3. LEGAL AND INSTITUTIONAL FRAMEWORK

Accession of Romania to the EU took place on 1st January 2007. Upon accession, Romania adopted the body of EU environmental law. This included:

- 2002/358/EC: Approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder;
- 85/337/EEC: Directive governing the assessment of the environmental effects of those public and private projects which are likely to have significant effects on the environment;
- 2001/80/EC: Directive on the limitation of emissions of certain pollutants into the air from large combustion plants (LCP Directive);
- 96/62/EC: Air Quality Framework Directive on ambient air quality assessment and management;
- 96/61/EC: Directive of 24th September 1996 concerning integrated pollution prevention and control (IPPC);
- 1999/30/EC: Directive for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead;
- 2002/49/EC: Directive relating to the assessment and management of environmental noise; and
- 92/43/EEC: Directive on the conservation of natural habitats and of wild fauna and flora.

With accession of Romania to the EU, the body of EU environmental law was transposed into national legislation, primarily through local resolutions (Government Decision – GD, Emergency Governmental Ordinance – EGO, Ministerial Order – MO) operating in conjunction with pre-existing national legislation in place prior to EU ascension.

Although EU law was transposed into national legislation before and/or upon ascension to the EU, certain installations existing prior to EU ascension were given a transition period in which to achieve compliance with EU measures and standards. Depending on the nature of the pre-existing installation, varying transition periods were negotiated with European Union Commission.

## 3.1. Combined Cycle Power Plant (CCPP)

Specifically, the CCPP falls under the provisions of two EU Directives:

- Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants (LCP Directive); and
- Directive 2008/1/EC, which replaced Directive 96/61/EC, concerning integrated pollution prevention and control (IPPC Directive).

The proposed CCPP was assessed against the provisions of both abovementioned EU Directives, which have also been fully transposed into Romanian legislation.

Best available techniques (BAT) applicable to the CCPP for ensuring environmental protection are outlined in the Reference Document on Best Available Techniques for Large Combustion Plants, July 2006.

The CCPP will be designed and implemented based on new technologies with high power efficiency, in conformity with current BAT for power generation.

The pollutant concentrations in air emissions generated by CCPP sources will be not exceed limit values in the LCP Directive and emission levels which could be met by BAT application – as stated by the Plant supplier (GE).

The technique for emissions control (low NOx burners) is compliant with the respective BAT.

In conclusion, the CCPP to be implemented by Petrom will comply with the requirements of both LCP and IPPC Directives.

## 3.2. Natural Gas Pipeline

Methods of pipeline construction will be chosen in the detailed engineering design phase when the routing of the pipeline will be finalised.

## 3.3. Overhead Line (OHL) Connection

The OHL Connection between the CCPP and National Grid will involve installation of new pylons, overhead cables, High Voltage (HV) switchgear (state-of-the-art by Siemens) and extension of the 400/220/110kV Brazi Vest Substation which mainly comprise extension of the existing 220kV and 400kV substation to include one and two additional units, respectively.

All of the above will be installed in accordance with Romanian norms which are comparable with those used across Europe.

Upon commissioning, the above infrastructure will operate within Romanian and industry norms for issues such as air emissions, noise and electromagnetic radiation, etc.

# 4. BASELINE ENVIRONMENTAL CONDITIONS

## 4.1. COMBINED CYCLE POWER PLANT (CCPP)

### 4.1.1. Soils

Soils within the Refinery complex at the CCPP site have been found to contain limited contamination with petroleum-related substances, such as benzene, likely as a result of previous petrochemical manufacturing activities carried out at the site. Although some contamination has been identified, this has not been found in concentrations exceeding permissible limits for industrial sites, such as a refinery.

### 4.1.2. Hydro-geology and Underground Water

The local water table is located in the permeable alluvia deposits at a depth of approximately 4.0m-4.5m below ground level (bgl) and represents the Colentina phreatic aquifer. Water in this aquifer has been found to be contaminated with petroleum-related products and as a result is not used as a potable source. Other groundwater aquifers which underlie the site are the Mostistea aquifer complex of medium depth 25m–120m bgl and the deeper aquifer, Fratesti, which is used intensively as a drinking water supply source for Bucharest and surrounding areas. The general flow direction of groundwater is NW-SE, towards Prahova River.

### 4.1.3. Atmospheric Air Quality

Baseline meteorological and ambient air quality data was obtained from real-time monitoring stations located around the Refinery and in the wider surrounding area. Data obtained was not found to exceed ambient air quality limits, although the area is highly industrialised and a number of other refining installations are present in/around Ploiesti.

### 4.1.4. Water

Baseline water usage data from 2004, 2005 and 2006 from surface and sub-surface sources in Prahova County was collected. Prahova River and its associated tributaries comprise the largest water source in the County. Potable and industrial/agricultural water is also sourced in the County from various surface water bodies such as Paltinu and Maneciu Lakes.

### 4.1.5. Biodiversity

Currently the site stands unoccupied with a bare earth surface and sparse scattering of vegetation, having been subject to recent decommissioning of former petrochemical infrastructure. The location of the Site is not situated near to any

protected areas, such as those designated under Natura 2000. In addition, given the presence of former petrochemicals infrastructure at the site and recent decommissioning activities carried out, the site is not considered to provide habitat for any protected species which may have migrated and settled there. The closest protected area under the Natura 2000 classification is *ROSCI0224 Scrovistea* (Site of Community Importance), located approximately 15km in a southerly direction from the Refinery.

### 4.1.6. Landscape

Brazi Commune has a landscape which is dominated by the presence of the Refinery and neighbouring Dalkia CHP (Combined Heat and Power) plant. Both of these installations are connected to the National Grid via numerous large HV power lines which cut across neighbouring open agricultural land with few features or mature vegetation. The landscape of the local Brazi area was classified as Poor-Ordinary with the following characteristics:

- Open agricultural land;
- Urban fringe with presence of local settlements and land use designation;
- Presence of significant number of overhead power lines; and
- Lack of natural features and mature vegetation.

### 4.1.7. Noise

Individual sources and cumulative impact from neighbouring installations were assessed as part of the baseline noise survey. The largest noise generator in relation to the site is Linde Gas, located immediately north of the site, who provide industrial nitrogen to the Refinery. At the time of baseline survey, Linde Gas were operating an Air Separation Unit (ASU) – a significant noise source. The ASU has since been decommissioned and replaced with a less noisy modern substitute. Other noise sources affecting the site are the nearby Dalkia CHP plant and air compressors/isomerisation plant of the Refinery.

### 4.1.8. Socio-economic and Cultural Heritage

The municipal capital of Prahova County is Ploiesti, which lies approximately 6km north of the CCPP, and has a population of approximately 248,688 (2002 Census).
Prahova County has a significant industrial history, with oil and gas extraction and refining activities having occurred since late 1800s. A number of refineries are located in the local area (Petrobrazi, Petrotel-Lukoil, Astra Romana, Vega, and Steaua Romana).

In Brazi Commune (Brazi) there are six villages (Brazii de Sus, Brazii de Jos, Negoiesti, Popesti, Batesti and Stejaru). The local population comprises 8,300

people with 80% of local workforce being employed by the Refinery and its sub-contractors (pers com. Brazi Mayor, 15th January 2009).

As the CCPP site is located within the confines of the Refinery, was formerly occupied by petrochemical manufacturing facilities until recently and has undergone site clearance activities, there are no known cultural heritage issues associated with the site.

## 4.2. OVERHEAD LINE (OHL) CONNECTION

### 4.2.1. Soils and Geology

No other land uses outside the Refinery and Brazi Vest substation apart from agriculture are known to have occurred. Sources of contamination are not usually associated with such land use. Land inside the Refinery at the CCPP site where the HV switchgear is to be installed has been found to be mildy contaminated with petroleum substances.

The sub-surface belongs to the Moesian Platform, and includes Neocene sedimentary formations, of simple monocline structure and vertical sedimentation continuity, with Pliocene formations at the base followed by Quaternary formations toward the surface. The Pliocene base consists of alternating clays, marls and sandstones, with Holocene deposits about 25m deep developing on the surface, mainly consisting of coarse alluvia and lenticular clayey insertions belonging to the alluvial cone of the Prahova, an important collector of groundwater.

### 4.2.2. Hydrology and Hydro-Geology

The OHL Connection is located at the northern end of the Romanian Plain, in the watershed between Prahova and Teleajen Rivers, although is not located on or near to any surface water bodies (rivers, streams, or lakes) or other type of wetland (swamp, pond, irrigation canals). Local groundwater is likely to be located at similar depths as at the CCPP sites, 4.0-5.5m bgl, and flowing in a NW to SE direction towards Prahova River. Hydro-geological conditions in the local area are characterised by three underground aquifer layers comprising of Colentina phreatic aquifer, Mostistea aquifer complex and Fratesti aquifer complex. The Colentina phreatic aquifer is located in the surface alluvia deposits and the deepest of the three aquifers, Fratesti, is used as a major water source for the city of Bucharest and surrounding areas.

### 4.2.3. Air Quality

Air quality in the area of the OHL Connection is mainly influenced by the industrial activities of the Refinery and Dalkia CHP plant. Some contribution to air pollution in

the local area is from urban-type sources (residential, institutional and commercial heating, road traffic) in the nearby localities of Brazii de Sus, Popesti, Negoiesti and Ploiesti. The main pollutants that affect ambient air quality include SO2, NOx, suspended particulate matter, volatile organic compounds (VOC) and H2S.

### 4.2.4. Noise and Vibration

The local area around the HV switchgear at the CCPP is impacted by noise associated with industrial activities of the Refinery and neighbouring Dalkia CHP. However, Brazi Vest substation is only impacted by noise generated by the activities of current ongoing operation of existing transformers and nearby road traffic. The central area over which the OHL circuits will pass is uninhabited agricultural land and is therefore not associated with excessive noise. The closest receptor to the OHL Connection is the settlement of Strejnicu, located approximately 750m in a north-easterly direction from Brazi Vest substation. The settlement of Negoiesti lies approximately 1km to the south of the OHL Connection.

### 4.2.5. Electro-magnetic Radiation

The OHL Connection route, for the most part, will cut across uninhabited open agricultural land.

### 4.2.6. Biodiversity

The HV switchgear will be located in the industrial area of the Refinery, while the expansion of Brazi Vest substation will involve development of existing infrastructure. Both sites have been subject to considerable human disturbance. The land over which the OHL circuits will cross, is of arable nature although at present remains fallow and covered by pioneer herbaceous flora. Fauna is poorly represented, and mainly includes amphibians, reptiles and rodents. The land dedicated for the OHL Connection is not part of any Natura 2000 site, or other protected area site.

### 4.2.7. Landscape

The site of HV switchgear installation at the CCPP within the Refinery (Refinery) is classified for industrial use, as is Brazi Vest substation where some expansions works will be carried out. The area that will be occupied by the OHL circuits is characterised by a typical plains landscape, without any mature vegetation. Vegetation cover is in the form of pioneer herbaceous species and a significant number of existing OHL cut across the landscape.

### 4.2.8. Socio-economic

In Brazi Commune (Brazi) there are six villages. The local population comprises 8,300 people with 80% of local workforce being employed by the Refinery and its sub-contractors. In Barcanesti Commune (Barcanesti) there are five villages with a total population of approximately 9,300. Those settlements in closest proximity to the OHL Connection are Strejnicu and Negoiesti, located 1km north east and 1.5km south of the OHL Connection, respectively.

# 5. IMPACTS AND MITIGATION

The assessment of impacts associated with the Project was carried out for the construction, operation and decommissioning phases.

Impacts were assessed against typical sources of environmental impact and receptors present in the field area.

## 5.1. COMBINED CYCLE POWER PLANT (CCPP)

### 5.1.1. Soils, Geology and Hydro-geology

***Impacts***

Construction, operation and decommissioning of the CCPP will not significantly alter current soil and geological conditions at the site, as the area has already been subject to intensive decommissioning activities of former petrochemical manufacturing infrastructure. Installation of heavy equipment foundations below the water table could potentially alter local groundwater flows on a permanent basis and introduce further contamination onto the site from off-site Refinery areas.

***Mitigation***

Additional groundwater monitoring wells will be installed along the CCPP site perimeter (exact location will be defined) to enable ongoing groundwater sampling/monitoring to be undertaken throughout the life of the CCPP.

### 5.1.2. Water and Wastewater

***Impacts***

The CCPP will require significant volumes of water for potable, process and fire-fighting purposes during operation (combined-cycle water heating/cooling system) and construction/decommissioning phases (multi-purpose uses such as dust suppression). The CCPP will generate wastewater in the form of sanitary waste from personnel, process wastewater from water decarbonisation/demineralization activities as part of the combined-cycle water heating/cooling system and storm/surface water run-off from rainfall events.

***Mitigation***

Potable, process and fire water for the CCPP will be sourced from various tie-in points into the Refinery's existing water supply networks. Wastewater at the CCPP will be managed through separate collection systems installed for sanitary and

process wastewater, as well as storm/surface run-off. Process wastewater will be collected and treated in a separate Waste Water Treatment Plant (WWTP) to be installed at the CCPP, whereas sanitary wastewater and storm/surface run-off will be collected and channelled to the Refinery's wastewater collection/treatment/discharge system.

### 5.1.3. Air Quality

Combined-cycle natural gas combustion is the method of power generation that has been chosen for the CCPP. This method of power generation is the most efficient and produces less emissions than other fuels. Table 2 is repeated below:

| Fuel | Efficiency (%) | $CO_2$ Emissions (g/kWh) | $SO_2$ Emissions ($mg/Nm^3$) | $NO_X$ Emissions ($mg/Nm^3$) |
|---|---|---|---|---|
| Combined Cycle Natural Gas | 54-58 | 360 | <35 | <50 |
| Oil | 36-40 | 740 | 50-150 | 50-100 |
| Coal | 54-58 | 700 | 20-200 | 50-150 |

***Impacts***

The most significant atmospheric emissions from the CCPP will be from the operational phase when natural gas will be combusted to drive the gas turbines and also generate heat/steam for the steam turbine, resulting in nitrous oxide (NOx) and sulphur oxide (SOx) emissions.

Other atmospheric emissions produced during the construction/decommissioning phase will include dust during dry periods and diesel fumes from heavy machinery/equipment operation.

As the CCPP is located in close proximity to other significant NOx and SOx emitters in the form of the Refinery itself and neighbouring Dalkia CHP plant, there is also potential for ambient air quality exceedances as a result of cumulative effects from all sources.

***Mitigation***

Low NOx burners will be fitted to the CCPP to ensure that NOx emissions do not exceed permitted concentrations under the EU Large Combustion Plant Directive. The sulphur content in the natural gas feedstock to be used by the CCPP is low and hence will not result in significant SOx emissions from the auxiliary steam boiler. In order to monitor both NOx and SOx concentrations in CCPP flue gas, real-time air emissions monitoring equipment will be installed to CCPP flue stacks.

Other atmospheric emissions during the construction/decommissioning phase will be controlled using basic mitigation measures such as dampening of site work surfaces

to reduce dust and reduction of site traffic/machinery speeds to achieve diesel fume reductions.

As a result of ongoing decommissioning of redundant and active sources of air emissions in the Refinery, a cumulative air emissions impacts study, incorporating dispersion modelling, of all sources of air emissions within the Refinery complex (CCPP and Refinery) and from Dalkia CHP plant will be conducted prior to commissioning of the CCPP.

### 5.1.4. Noise

***Impacts***

In relation to sensitive receptors, such as the nearby settlement of Negoiesti, road traffic comprising of light and heavy goods vehicles travelling to/from the CCPP will present the largest noise source during the life of the CCPP. During the operational phase, the gas turbines themselves will produce the most amount of noise. Noise generated by the gas turbines has the potential to exceed permitted noise levels for worker occupational health within the CCPP as well as ambient noise levels at the CCPP boundary.

***Mitigation***

In order to reduce the amount of noise generated by road traffic travelling to/from the site during the construction of the CCPP, a Traffic Management Plan will be implemented and circulated to all drivers, outlining the appropriate routes to taken thereby avoiding populated areas and also outlining general driving best practice to be adopted such as speed reduction.

The gas turbines, as part of the standard construction package from the supplier, will be built into special noise attenuation enclosures, with silencers integrated into the gas turbine air intake and exhaust gas outlet channels.

During operation of the CCPP, annual noise monitoring will be carried out at the CCPP to monitor worker occupational exposure to noise, as well as ambient noise levels at the CCPP site boundary and nearby settlements, such as of Negoiesti.

### 5.1.5. Hazardous Materials Storage/Handling

***Impacts***

During the life of the CCPP, it is likely that there will be a requirement to store hazardous materials on-site such as fuels, oils, lubricants, acids, alkalis, etc for machinery/vehicle operation/maintenance and process reagent use. Improper storage and handling of the abovementioned materials could result in ground

contamination of bare earth surfaces/surface drains as well as pose an unnecessary occupational health and safety risk.

***Mitigation***

Hazardous materials will be stored in secure, covered areas over sealed ground and with appropriate bunding and spill response equipment located nearby. Personnel operating at the CCPP construction site will also be appropriately trained in spill-response procedures therefore ensuring that any spills are contained and cleared up immediately. Vehicles which are used on site will be regularly maintained and those which remain on site overnight will be equipped with drip trays to avoid ground contamination in the accordance with the status of the vehicle.

### 5.1.6. Biodiversity

***Impacts***

Given the presence of the site within the Refinery and recent decommissioning activities carried out, CCPP construction will not have an adverse effect on local biodiversity. During operation, it is likely that large areas of the CCPP ground surface will either be paved/stoned in order to control surface water drainage as well as eliminate any combustible materials presenting a fire hazard. Therefore adverse impacts at decommissioning are not envisaged.

***Mitigation***

No mitigation is planned.

### 5.1.7. Landscape

***Impacts***

Installation of the CCPP within the existing Refinery, in an area formerly occupied by petrochemical manufacturing facilities, will not significantly alter the appearance of the local landscape.

***Mitigation***

No mitigation is planned.

### 5.1.8. Socio-economic

***Impacts***

As the CCPP will be constructed within the confines of the Refinery on land owned/operated by Petrom, no land acquisition will be required from Third parties.

Significant increases in road traffic will occur during the construction/decommissioning of the CCPP. Therefore this increase in road traffic, particularly near small settlements could present an increased public safety risk.

The main positive effect of development of the CCPP will be associated with large increases in tax collection by the local council of Brazi. Prior to CCPP development, local tax collection in the area was used to fund development of, among others, the following local public infrastructure:

- Completion of two sports halls in Popesti (2005) and Batesti (2007); and
- Commencement of works for development of:
    - Multi-use entertainment/conferencing centre in Brazii de Sus;
    - Healthcare units in Popesti and Negoiesti;
    - Veterinary unit in Popesti;
    - Kindergarden in Brazii de Sus and Negoiesti;
    - Sewer system in Brazii de Sus and Brazi de Jos; and
    - Aesthetic improvements to central areas of Brazii de Jos.

Funds from CCPP tax payments will be used to support the abovementioned developments through to completion and also fund:

- Design phase of a new sports facility in Negoiesti;
- Sewage system in Popesti and Negoiesti;
- Extension of water supply network in Stegaru; and
- Construction of dwellings; and
- Cemetery in Batesti.

***Mitigation***

In conjunction with managing noise from CCPP-related activities, the Traffic Management Plan to be developed will outline appropriate routes, and safety requirements such as speed limits, and avoidance of populated areas, thereby reducing the risk of incidents.

## 5.2. NATURAL GAS PIPELINE

Environmental and social analysis of the pipeline will be carried out in Q3 2009 following submission of the final route to the authorities.

## 5.3. OVERHEAD LINE (OHL) CONNECTION

### 5.3.1. Soils and Geology

***Impacts***

The main adverse impacts of the OHL Connection will be during the construction phase when excavation of soil (20 isolated locations in total) for pylon foundation installation and cable stringing will occur. Some compaction of soils may occur along the 3km OHL Connection route that will be used by construction/supply vehicles. No impacts on soils and geology will result from operation of the OHL Connection. Similar impacts during construction may occur at decommissioning.

***Mitigation***

As pylon installation/decommissioning activities will be relatively short-lived and localised, no further mitigation is planned.

### 5.3.2. Water

***Impacts***

Groundwater may present construction challenges if pylon foundations are required to be installed below the water table. During the construction and decommissioning phases, potable water will be required for human consumption and process water for general construction purposes. During operation, only potable water will be required for human consumptions by operating personnel. Potable and any process water needs will be supplied from the existing supply networks at Brazi Vest substation and the Refinery Wastewater will mainly comprise of sanitary waste from personnel operating the OHL Connection and storm/surface water during construction, operation and decommissioning activities. There will be negligible volumes of process wastewater generated.

***Mitigation***

Should groundwater be encountered during pylon installation activities, de-watering will be carried out. Collected water will be discharged in a controlled manner into the existing wastewater collection system at Brazi Vest substation or at the Refinery. Similarly sanitary waste will be collected using mobile eco-toilets during the construction/decommissioning phases and discharged into the existing wastewater systems of Brazi Vest substation and the Refinery.

### 5.3.3. Air Quality

***Impacts***

Main air quality impacts will be during the construction phase in the form of dust and diesel fumes from construction traffic working along the OHL Connection route. The closest sensitive receptor to the OHL Connection is in the form of Strejnicu, which lies approximately 750m north east. Normal operation of the OHL Connection will not result in significant air emissions.

***Mitigation***

A Traffic Management Plan will be developed for the construction phase which outlines appropriate routes to be taken to access the OHL Connection, avoid populated areas and communicate acceptable speed limits to drivers of construction vehicles. In areas where earthmoving will takes place, the ground surface will be maintained in a damp state so as to reduce dust generation. Low emissions construction vehicles will be operated appropriately and when not in use will be turned off. An Air Management Plan will be developed and implemented to mitigate impacts on air quality.

### 5.3.4. Noise and Vibration

***Impacts***

Normal operation of the OHL Connection will not result in excessive of noise. Main noise impacts will again be during the construction/decommissioning phase from construction equipment/machinery installing/removing pylons/cables and transformer units. The closest receptor to the OHL Connection is 750m in a north east direction from Brazi Vest substation.

***Mitigation***

As the OHL Connection is relatively well removed from sensitive receptors, no particular noise mitigation is planned apart from basic measures such as use of well-maintained equipment during daylight hours.

### 5.3.5. Electro-magnetic Radiation

***Impacts***

Only during the operation phase will electro-magnetic radiation be produced by the OHL Connection. Electromagnetic radiation has an electrical and magnetic fields of phase oscillation that are perpendicular on each other and both perpendicular to the

energy path. Depending on the size of current, this radiation is detrimental to human health.

***Mitigation***

Electromagnetic radiation produced by the OHL Connection will not exceed threshold levels that will cause a detrimental effect in humans approaching the circuits. Upon installation, certain land use restrictions will apply to a buffer zone around the OHL Connection in order to ensure safe operation and avoid impacts on human health. The closest sensitive receptor to the OHL Connection is 750m in a north-easterly direction.

### 5.3.6. Biodiversity

***Impacts***

The OHL Connection will be sited partly within the Refinery and across open agricultural fields. OHL construction/decommissioning activities will disturb local flora and fauna on a temporary basis.

***Mitigation***

As the OHL Connection does not pass through or near to any protected areas, no further mitigation is planned.

### 5.3.7. Landscape

***Impacts***

Installation of the OHL Connection will be noticeable to local communities living in the area. The closest sensitive receptor to the OHL Connection will be 750m north east in the settlement of Strejnicu.

***Mitigation***

As there are a number of OHL crossing the landscape in the vicinity of the Refinery and Brazi Vest substation and the OHL Connection will pass for a significant length in an existing OHL corridor, no further mitigation is planned.

### 5.3.8. Socio-economic

***Impacts***

The closest settlement in relation to the OHL Connection is Strejnicu, some 750m in a north east direction.

Whilst the construction phase of the OHL Connection will be a source of employment for labour in the local area, it will require access through a number of plots of land owned/operated by Third parties. As HV OHL power transmission carries inherent risk of electrocution, upon installation, certain land use restrictions will apply within the OHL Connection corridor so as to avoid damage to the integrity of pylons etc and ensure safe power transmission. Zoning restrictions will apply, on either side of the OHL circuits and activities such as construction and tree planting will be prohibited.

OHL Connection construction/decommissioning may result in cropping restrictions/disturbance.

***Mitigation***

The public will be excluded from immediate areas of construction by installation of warning signage and fencing around the immediate construction area. Rights-of-ways and purchase of land for pylon installation will be agreed on a willing seller, willing buyer basis with fair compensation and consent from the local authorities.

# 6. ENVIRONMENTAL AND SOCIAL MANAGEMENT

In order to ensure implementation and effective management of the planned mitigation measures during the life of the Project, specific Environmental and Social Action Plans (ESAPs) have been developed for each component of the Project – CCPP, OHL Connection and linkages with the Refinery, summarised in the Mitigation Measures sections above.

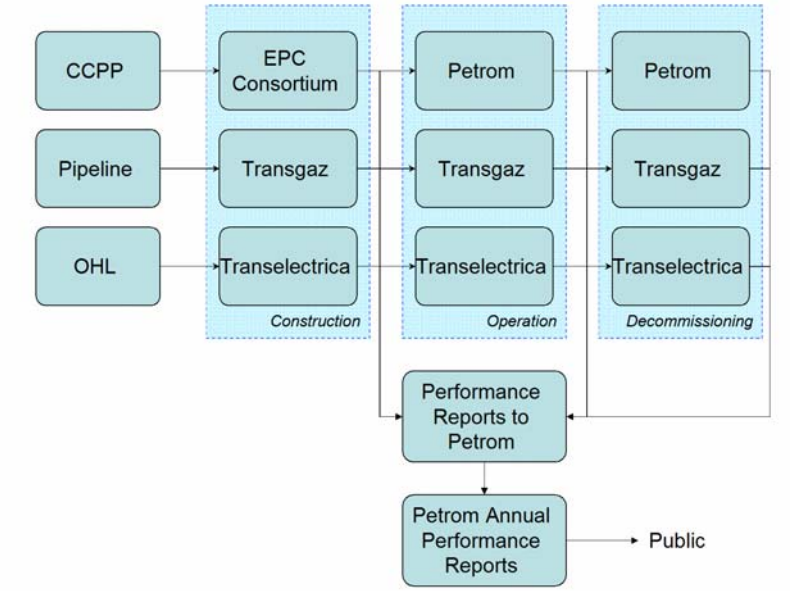
Environmental and social analysis of the pipeline, with associated Environmental and Social Action, if any, will be completed in Q3 2009 when the route is finalised and submitted to the authorities.

The main actions in the ESAPs consist of the management plans development for mitigation of the impacts on the environmental media, on the workers and population. The management plans are refer to management of wastewater, soil, groundwater and surface water quality, biodiversity, air emissions, noise and vibration, material handling and storage and waste.

In order to ensure that environmental performance is maintained throughout the Project by the various entities carrying out construction, operation and decommissioning phases of the CCPP, Pipeline and OHL Connection, regular reports will be provided to Petrom, who will produce an annual Project Environmental Performance Report which will be provided to the public.

Figure 7 below outlines the reporting channels to be followed during the Project.

**Figure 6: Environmental Performance Reporting Channels**




Appropriate management of occupational health and safety will play an important part in successfully implementing the Project. Throughout the Project, from

construction through to decommissioning, occupational health and safety incidents will be recorded and statistics presented annually as part of the Petrom Annual Performance Report. Occupational health and safety standards to be implemented by all components/Contractors of the Project will meet, as a minimum, the standards currently in place in Petrom.

# 7. FUTURE PUBLIC CONSULTATION

In order to effectively engage affected stakeholders in the Project, a Stakeholder Engagement Plan (SEP) has been implemented. The purpose of the SEP is to describe the strategy and program for engaging with stakeholders in an appropriate manner during the life of the Project and allow public complaints/comments to be made and rectified.

The SEP, can be found as part of this Disclosure Package and in various physical locations in the affected Project area, including Brazi Town Hall, Prahova Environmental Protection Agency, as well as on the internet at www.petrom.ro and www.arpmsm3.ro.

## 7.1. Future Stakeholder Engagement for CCPP

As the future investment falls under the provisions of the IPPC Directive, its permitting will have to be completed in the construction stage, after the equipment is assembled, but prior to its commissioning. In accordance with Romanian law, the application procedure for an integrated environmental permit will involve public information and consultation, including the organisation of another public hearing. After the commissioning of the CCPP, all the environmental pollutant emissions will be monitored, and the data made available to the public on request.

## 7.2. Future Stakeholder Engagement for Gas Pipeline

The final routing of the pipeline has not yet been finalised and submitted to the authorities for permitting. Upon finalising the pipeline route, it will be decided whether an EIA is required or not.

## 7.3. Future Stakeholder Engagement for OHL

Due to the limited length of the proposed OHL power connection (approximately 3km) and its low impact on the environment and other receptors, no EIA has been required by EPA Prahova for Lots 2 and 3. When a screening decision is made, public consultation will be required as part of the full-EIA or stream-lined permitting process.