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Executive summary

This document is provided pursuant to the provisions of Article 29 of the Treaty Establishing the Energy Community.

While formulating Ukraine's Statement on Security of Energy Supply (hereinafter referred to as «the Statement of Ukraine»), the Guideline issued by the Energy Community Secretariat to aid in the preparation of updated statements on security of supply by Member States of the Energy Community, approved at the 19th meeting of the Energy Community Permanent High Level Group on 23 March 2011 (Annex 11 of the Meeting), have been taken into consideration.

The Statement of Ukraine covers the electricity and gas sectors, regulated by the EU Directives and Regulations and indicated in Ukraine's Accession Protocol to the Energy Community. Further, the Statement of Ukraine covers the oil sector, pursuant the Decision of the Energy Community Ministerial Council of 11 December 2008, №. 2008/03/MC-EnC.
1. ELECTRICITY ENERGY SECTOR

1.1. Existing model of the electricity market

The wholesale electricity market of Ukraine, which is operated SC “Energorynok”, is responsible for buying all electricity generated by power stations which have a capacity or generation volume exceeding certain thresholds, by power stations generating electricity from alternative energy sources (except blast-furnace and coke oven gases, and for hydro – power generated only by small hydropower stations), irrespective of the volume of installed capacity or amount of electricity supplied (except electricity generated by combined heat and power plants, or by pools of electricity suppliers for consumption in a certain licensed territory). Operation of other wholesale electricity markets is prohibited in Ukraine.

Ukrainian energy legislation provides for the following types of electricity suppliers:

- the wholesale electricity supplier – SC “Energorynok” – whose particular activity is the wholesale supply of electricity;

- electricity suppliers at regulated tariff (SRT) – these are mainly oblast electricity supply companies (oblenergos), in some regions of Ukraine, structural divisions of “Ukrzalyznytsa” (the railway company) and economic entities working on the basis regulated (fixed) state tariff for electricity;

- electricity suppliers at non-regulated tariff (SNT) – these are economic entities entitled to supply customers at a non-regulated (uncontrolled) tariff. The availability of the services of the SNTs allows customers to buy electricity at a lower price than the fixed price offered by SRTs. Any legal entity may become a customer of a SNT.

As of 1 January 2011, there were 19,7 million electricity customers in Ukraine, 99 % of which received electricity from the networks of oblast electricity transmission companies.
Table 1 – Structured numbers of electricity customers as of 1.1.2011

<table>
<thead>
<tr>
<th></th>
<th>Customers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial customers</td>
<td>57 124</td>
<td>0,3</td>
</tr>
<tr>
<td>Non-industrial customers</td>
<td>481 113</td>
<td>2,4</td>
</tr>
<tr>
<td>Household customers</td>
<td>19 195 443</td>
<td>97,3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>19 733 680</td>
<td>100</td>
</tr>
</tbody>
</table>

1.2. Key players in the market and their obligations

The key state entities in charge of managing the electricity sector of Ukraine are the Cabinet of Ministers of Ukraine, the Ministry of Energy and Coal Industry of Ukraine (MECI), the National Electricity Regulatory Commission of Ukraine (NERC), the State Nuclear Regulatory Committee of Ukraine, and the State Agency for Energy Efficiency and Energy Conservation (SAEEEC).

According to Ukrainian electricity legislation, state management of the electricity sector is entrusted to the Ministry of Energy and Coal Industry of Ukraine, whose main responsibilities comprise of establishing development priorities and ensuring normative and legal regulation of fuel and energy complex, as well as developing a prognostic electricity balance for the Ukrainian electricity system.

State regulation of the activities of entities which are natural monopolies in the electricity sector is entrusted to the NERC. The main responsibilities of the NERC consist of promotion of competition in the electricity generation and supply sectors, issuing licenses to economic entities for the generation, transmission and supply of electricity, and controlling observance by licensees of terms and conditions of licensed activities.

The main responsibilities of the SAEEEC include the implementation of state policy and execution of state control of efficient use of energy resources, energy saving, and use and promotion of renewable energy sources and alternative fuels, so as to ensure growth in the share of renewable energy sources and alternative fuels in the energy balance of Ukraine.

There is a single centralised dispatch system for operational and technical management of generation, transmission and supply of electricity in Ukraine. The national electricity company NEC “Ukrenergo” was established so as to co-ordinate the de-
development and maintenance of trunk and international electric networks, to improve the operational and technical management of Ukraine's unified electricity system (UES) and to create conditions for reliable parallel operation with the energy systems of other countries. NEC “Ukrenergo” is a natural monopoly in the field of electricity transmission. The company structure is based on the principle of regionality and integrates eight electricity systems (Dnipro, Donbas, Western, Crimean, Southern, South-western, Northern and Central), and has 32 structural subdivisions for the maintenance of trunk and international electricity networks. Technical state supervision is exercised by the State Inspection for the Maintenance of Power Stations and Electricity Networks and the State Inspection for Energy Supervision of Consumption of Electricity and Heat.

1.3. Legal and regulatory framework in the sector

The principal legal framework of the sector comprises of:

- The Law of Ukraine of 16.10.1997 No. 575 On Electricity;
- The Law of Ukraine of 01.06.2000 No.1775 On Licensing of Certain Types of Economic Activities;
- The Law of Ukraine of 02.06.2005 No. 2633 On Heat Supply;
- The Law of Ukraine of 05.04.2005 No. 2509 On combined generation of heat and electricity (cogeneration) and use of waste energy potential.

1.3.1. Regulatory framework on tender and permission procedures

The Electricity Law does not address tendering procedure for new capacity or establish a regime such as that provided in Article 7 of Directive 2003/54/EC. The construction of new generating capacity in Ukraine is covered by general building legislation, which regulates any other construction activity, and in certain cases special legislation, such as legislation which promotes renewable energy (RES).

At the same time, certain special legislation exists in Ukraine on energy construction, clearly purported to promote the introduction of new capacity.

One of the important issues in the construction of any new energy capacity is the procurement the necessary land (plots). This issue is regulated by the Law of Ukraine of 09.07.2010 No. 2480 On energy land and the legal regime of special zones for
energy objects. Article 14 of the Energy Land Law foresees that state and municipally owned land is transferred to the ownership or use for energy purposes in accordance with decisions by state executive bodies or the relevant local authorities, in accordance with the procedures, and as provided in detail, by the Land Code of Ukraine. Private land may be acquired from its owner in accordance with procedures provided, also, by the Land Code. The area and borders of the land plot needed for new generation or transmission capacity is determined on the basis on the relevant construction project (Article 15(1) of the Law).

Technical, construction and other requirements for new energy capacity are regulated by a large number of state building norms and standards.

Another important issue concerning new capacity is the connection of generation facilities to the grid. For RES-based electricity generation, the connection cost shall be included in the general investment programme of the grid owners (usually oblenergos). Such grid owners are not allowed to refuse RES-based generators grid connection and access.

### 1.4. Technical safety of electricity system

Currently, a major share of power-generating assets and electric networks is out fully depreciated.

- As of the end of 2010, 81% of thermal power-station modules exceeded their planned life span of 200,000 hours of operation and are in need of modernisation or replacement.

- Also many nuclear units are close to the expiry of their designed time of operation: more than 70% of nuclear units will require and extension of time of operation within the next 10 years.

- The budgets of Ukrainian energy system have deficits with regard to both frequency and capacity regulation; the share of power stations providing most part of frequency regulation capacity does not exceed 9% of the total electricity sector budget, while the optimum level would be 15%. Because of this, coal units designed to operate in continuous mode are used to support the variable part of the electricity system load curve.

- Today, 35% of overhead power transmission lines (PTL) in the voltage range of 220 – 330 kV, have been operating for more than 40 years, and 55% of the main
equipment of transformer substations have reached the end of their planned service life.

- A considerable share of components which make up the electricity distribution networks have also reached the end of their planned service life, as some 31% of electricity networks and 32% of transformer substations are in need of reconstruction or replacement.

Since the capital assets of the Ukrainian electricity system are significantly depreciated, plenty of work is needed to secure increases in the life span of the Ukrainian UES.

The state controls observance of the provisions of regulatory and technical documents and related legal acts which cover technical maintenance of power stations and networks and requirements on the technical maintenance of power equipment of electricity objects. This supports the necessary level of technical discipline at power generation units connected to the Ukrainian UES and secures its required level of operational reliability.

Currently, the Ukrainian UES provides for the following (implemented) types of emergency automation measure for the prevention of dangerous frequency reduction and securing its fast recovery after the occurrence of a significant power failure:

- automatic frequency triggering hydroelectric generators;
- automatic frequency unloading customers;
- automatic allocation of power-generating unit(s) to be loaded for internal needs of power station(s);
- securing power-generating unit(s) to be loaded for internal needs of power stations and “load islands” automatically disconnected from the electricity network;
- allocation of nuclear power plants to be loaded for internal needs.

1.5. Instruments and measures to compensate deficiency of one or more supplier; emergency measures in case of sudden power failure

Electricity supply contracts between the wholesale electricity supplier and electricity suppliers at regulated tariff, and electricity supply contracts between the wholesale electricity supplier and electricity suppliers at non-regulated tariff provide for a
mechanism of transfer of customers of a supplier at non-regulated tariff to a supplier at regulated tariff in case of insolvency of the non-regulated supplier. Further, the wholesale electricity supplier shall stop electricity supply to the electricity supplier at non-regulated tariff in its territory, and the supplier at regulated tariff which is responsible for such territory shall start selling electricity to the customer of this supplier at non-regulated tariff.

The Ukrainian UES is usually a net exporter of electricity, except in emergency situations.

1.6. Generation capacity

1.6.1. Primary sources for generation

Ukraine belongs to the countries that have only partial domestic supply of traditional types of a primary energy and must therefore resort to imports. Ukraine's import-dependence is of average European level and has a decreasing tendency.

Power-generating coal is the main fuel for thermal power stations owned by power-generating companies. Natural gas and heavy fuel oil are used in them only for technical purposes.

Natural gas is the main fuel in the majority of combined heat and power stations.

All electricity and heat generation (for all customer groups except households) at thermal power stations and combined heat and power stations is based on imported natural gas.

The key aspect of Ukrainian energy policy is to increase the share of nuclear power and locally extracted coal in the energy budget, and to decrease the share of imported oil and gas.

Future development of thermal power is forecast to be based on coal, taking into account the need to substitute natural gas for electricity generation, and other fuels for heating and hot water supply.

Generation of nuclear-based electricity is planned to occur with the maximum use of locally produced uranium and zirconium, and through the adoption of new technologies for nuclear power production.
1.6.2. Existing power plants

As of 1.1.2011, the total installed capacity of electric power-generating stations in Ukraine was 53,161 GW, 51 % of which were thermal power plants (TPP), 26 % nuclear power plants (NPP), 10 % hydro power plants (HPP), and 14 % and hydro storage plants (HSP), combined heat and power plants (CHP) block units and other small generators. Taking into consideration suspended units and units under reconstruction, as well as limitations of electricity networks to transmit NPP-based power, the total installed capacity of blocks available for operation was 47 GW.

Table 2 – Installed capacity of power stations of the Ukrainian UES.

<table>
<thead>
<tr>
<th>Type of power plant</th>
<th>Installed capacity, MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal power plants (TPP)</td>
<td>30 536,1</td>
</tr>
<tr>
<td>Nuclear power plants (NPP)</td>
<td>13 835,0</td>
</tr>
<tr>
<td>Hydro power plants (HPP)</td>
<td>4 596,6</td>
</tr>
<tr>
<td>Hydro storage plants (HSP)</td>
<td>861,5</td>
</tr>
<tr>
<td>Renewable sources</td>
<td>156,1</td>
</tr>
</tbody>
</table>

Five power-generating companies (“Dnyproenergo”, “Donbasenergo”, “Tsentrenergo”, “Zahydenergo”, “Skhydenergo”) integrate 14 powerful TPP with power blocks of individual capacity of 150, 200, 300 and 800 MW. The total number of power-generating units at TPP and HPP equals to 102 units, including: with capacity of 150 MW – 6 units, 200 MW – 42 units, 250 MW – 5 units, 300 MW – 42 units and 800 MW – 7 units. The most powerful TPPs (Zaporyzhskaya and Uglegorskaya) have an installed capacity of 3 600 MW each.

The private JSC “Ukrgydroenergo” operates cascades of hydro power plants on the rivers Dnipro and Dnister. The total number of hydroelectric generators is 103. The most powerful hydro plant, Dniprovskaya HPP, has an installed capacity of 1 500 MW. Dnistrovska HSP has a hydroelectric generator with 324 MW of generated and 420 MW of consumed capacity.
NAEC “Energoatom”, with four NPPs, 15 hydroelectric generators, 13 of which have WWER-1000-type reactors with a capacity of 1000 MW each and two have WWER-440 reactors with capacities of 415 and 420 MW.

UES of Ukraine, along with the power plants of the MECI, includes power plants of other ministries and institutions, as well as TPPs in municipal ownership (557,76 MW), privately owned TPPs (317MW) and block plants (2 363 MW).

1.6.3. Capacity of the electricity network

The length of Ukraine's trunk electricity networks is 22 900 km, of which 4 900 km are networks with voltage of 400–800 kV, 13 200 km are networks with voltage of 330 kV, 4 100 km are networks with voltage of 220 kV and 700 km are networks with voltage of 35–110 kV. There are 133 substations with a total transformer capacity of 78 442,9 MVA.

The length of electricity distribution networks is ca. 1 million overhead and cable lines of 0,4–150 kV, with some 200 000 transformer substations with of 6–150 kV.

The Ukrainian UES operates in parallel with that of the EES of Russia, with the exception of the so-called Burshtyn Island, which includes Burshtyn TPP, Kalush HPP and Tereblya-Rykska HPP. Burshtyn Island is synchronised with the European network of transmission system operators for electricity (ENTSO-E).
1.7. Characteristics of the energy system

1.7.1. Current level and structure of energy consumption and forecast electricity demand for the next five years (2011 – 2015)

The expected volume of electricity consumption for the period of 2011 – 2015 has been calculated on the basis of statistical analysis of the dynamics and structure of electricity consumption by main customer groups of customers in the past five years.

Starting from 2002, the dynamics of electricity consumption in Ukraine may be characterised as continuous year-to-year growth, with the exception of years 2008 and 2009, when a decrease of 0.4 % and 9.1 %, respectively, was registered.

Negative changes in the dynamics of Ukrainian electricity consumption in 2008 (starting from Q4) and 2009 were caused by a significant decline in production volumes, especially by industrial enterprises, due to the global economic crisis.

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1 As of the moment of the Statement development, statistical data for 2011 related to Ukrainian energy sector results were under preparation
The positive dynamics of electricity consumption started to resume in Q4 of 2009. In 2010, the total volume of electricity consumption in Ukraine, which was 144,7 billion kWh, almost reached the pre-crisis consumption level of 2007 (147,4 billion kWh). Decrease of electricity consumption in 2010, as compared to 2007, was only 1,8 %. At the same time, the decrease in electricity consumption by industry in 2010, as compared to 2007, was 6,8 %. Electricity consumption by households increased by 29,4 % during the same period.

To sum up, the structure of electricity consumption in 2010, when compared to 2007, saw significant changes in weighed electricity consumption by power-intensive groups of customers. Weighed electricity consumption of industry decreased from 50,8 % in 2007 to 48,2 % in 2010, and that of households increased from 20,1 % to 26,5 %.

In 2011, the tendency of growth in continued in electricity consumption. In 2011 – 2015, the forecast volumes of electricity consumption (net) will amount to: 2012 - 157,5 billion kWh, growth as compared to the previous year - 3,2 %; 2013 - 163,0 billion kWh, growth as compared to the previous year - 3,5 %; 2014 - 169,6 billion kWh, growth as compared to the previous year - 4,1 %; 2015 - 176,7 billion kWh, growth as compared to the previous year - 4,2 %.

In the structure of electricity consumption forecast for the period of 2011 – 2015, no significant changes are expected in the relative weights of the main groups of customers, as compared to 2010.

According to the forecast, the total volume of electricity consumption in Ukraine will grow in the weighed group of household customers, from 25,8 % in 2011 to 27,0 % in 2015, and minor decreases will occur in the weighed electricity consumption by industry, from 48,1 % in 2011 to 47,7 % in 2015.
Figure 2 – Structure of expected electricity consumption in Ukraine in 2011-2015

![Chart showing expected electricity consumption by sector in Ukraine from 2011 to 2015.](chart-image)

- **Consumption Groups**
  - Industry
  - Agricultural consumers
  - Transport
  - Construction
  - Municipal and household consumers
  - Other non-industrial consumers
  - Population

- **Consumption (Netto)**
  - **2011**
    - Industry: 84319.3
    - Agricultural consumers: 73432.8
    - Transport: 10347.1
    - Construction: 12000
    - Municipal and household consumers: 16611.1
    - Other non-industrial consumers: 20346.5
    - Population: 39369.2
  - **2015**
    - Industry: 3400
    - Agricultural consumers: 3752.7
    - Transport: 960.9
    - Construction: 1212.8
    - Municipal and household consumers: 6286.1
    - Other non-industrial consumers: 7794.1
    - Population: 47625.7

- **Total Consumption**
  - **2011**: 152707.2 million kWh
  - **2015**: 176661.1 million kWh
Table 3 – Structure of expected electricity consumption in Ukraine in 2011-2015

<table>
<thead>
<tr>
<th>Customer groups</th>
<th>Expected electricity consumption in 2011 (mln KWh)</th>
<th>% (decline +growth) as compared to 2010</th>
<th>Expected electricity consumption in 2012 (mln KWh)</th>
<th>% (decline +growth) as compared to 2011</th>
<th>Expected electricity consumption in 2013 (mln KWh)</th>
<th>% (decline +growth) as compared to 2012</th>
<th>Expected electricity consumption in 2014 (mln KWh)</th>
<th>% (decline +growth) as compared to 2013</th>
<th>Expected electricity consumption in 2015 (mln KWh)</th>
<th>% (decline +growth) as compared to 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply of electricity to customers (net)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Industry</td>
<td>152 707,2</td>
<td>3,5</td>
<td>157 535,9</td>
<td>3,2</td>
<td>162 971,5</td>
<td>3,5</td>
<td>169 605,8</td>
<td>4,1</td>
<td>176 667,1</td>
<td>4,2</td>
</tr>
<tr>
<td>including key sectors:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>9 549,6</td>
<td>1,6</td>
<td>9 721,4</td>
<td>1,8</td>
<td>9 935,3</td>
<td>2,2</td>
<td>10 183,7</td>
<td>2,5</td>
<td>10 489,2</td>
<td>3,0</td>
</tr>
<tr>
<td>Metallurgy</td>
<td>38 207,4</td>
<td>-0,6</td>
<td>38 780,6</td>
<td>1,5</td>
<td>39 866,4</td>
<td>2,8</td>
<td>41 461,1</td>
<td>4,0</td>
<td>43 119,5</td>
<td>4,0</td>
</tr>
<tr>
<td>Chemical and petrochemical</td>
<td>6 127,5</td>
<td>15,0</td>
<td>6 433,8</td>
<td>5,0</td>
<td>6 755,5</td>
<td>5,0</td>
<td>7 093,3</td>
<td>5,0</td>
<td>7 448,0</td>
<td>5,0</td>
</tr>
<tr>
<td>Machine-building</td>
<td>6 498,4</td>
<td>9,0</td>
<td>6 823,3</td>
<td>5,0</td>
<td>7 028,0</td>
<td>3,0</td>
<td>7 238,9</td>
<td>3,0</td>
<td>7 456,0</td>
<td>3,0</td>
</tr>
<tr>
<td>Construction materials</td>
<td>2 644,1</td>
<td>9,0</td>
<td>2 829,2</td>
<td>7,0</td>
<td>3 112,1</td>
<td>10,0</td>
<td>3 361,0</td>
<td>8,0</td>
<td>3 629,9</td>
<td>8,0</td>
</tr>
<tr>
<td>Food and food processing</td>
<td>4 715,7</td>
<td>2,0</td>
<td>4 833,6</td>
<td>2,5</td>
<td>4 978,6</td>
<td>3,0</td>
<td>5 227,5</td>
<td>5,0</td>
<td>5 488,9</td>
<td>5,0</td>
</tr>
<tr>
<td>Others</td>
<td>5 690,2</td>
<td>6,5</td>
<td>5 860,9</td>
<td>3,0</td>
<td>6 066,0</td>
<td>3,5</td>
<td>6 369,3</td>
<td>5,0</td>
<td>6 687,8</td>
<td>5,0</td>
</tr>
<tr>
<td>2. Agricultural customers</td>
<td>3 400,0</td>
<td>0,2</td>
<td>3 451,0</td>
<td>1,5</td>
<td>3 554,6</td>
<td>3,0</td>
<td>3 661,2</td>
<td>3,0</td>
<td>3 752,7</td>
<td>2,5</td>
</tr>
<tr>
<td>3. Transport</td>
<td>10 347,1</td>
<td>9,5</td>
<td>10 688,5</td>
<td>3,3</td>
<td>11 094,7</td>
<td>3,8</td>
<td>11 538,5</td>
<td>4,0</td>
<td>12 000,0</td>
<td>4,0</td>
</tr>
<tr>
<td>4. Construction</td>
<td>960,9</td>
<td>1,0</td>
<td>1 008,9</td>
<td>5,0</td>
<td>1 059,4</td>
<td>5,0</td>
<td>1 122,9</td>
<td>6,0</td>
<td>1 212,8</td>
<td>8,0</td>
</tr>
<tr>
<td>5. Public utility customers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Other industrial customers</td>
<td>18 611,1</td>
<td>1,8</td>
<td>18 983,3</td>
<td>2,0</td>
<td>19 268,1</td>
<td>1,5</td>
<td>19 653,4</td>
<td>2,0</td>
<td>20 046,5</td>
<td>2,0</td>
</tr>
<tr>
<td>7. Population</td>
<td>39 369,2</td>
<td>4,5</td>
<td>41 337,7</td>
<td>5,0</td>
<td>43 197,9</td>
<td>4,5</td>
<td>45 357,8</td>
<td>5,0</td>
<td>47 625,7</td>
<td>5,0</td>
</tr>
</tbody>
</table>
1.7.2. Current level and a model ensuring maximum consumption of electricity (net, MW) and expected consumption of electricity in Ukraine in 2011 – 2015, taking into account the system of balancing instruments

On the basis of an analysis of winter regime load measurements made of the UES of Ukraine in 2006 – 2010, a structure was developed of expected consumption of electricity in 2011 – 2015.

According to the analysis, the dynamics of electricity consumption during 2006 – 2010 had a positive growth trend (net) every year, as compared with the previous one, except for load measurements of winter day regime in 2008 (Q4 of 2008, which coincided with the start of the global economic crisis).

During winter regime load measurements made in 2006 – 2010, no unusually low air temperatures were registered (the temperatures on those days were fluctuating from -1,2°C to -11,5°C).

In the winter of 2011 – 2015 (December), the following volumes of electricity consumption are expected (net):

- 2011 – 23 471 MW, growth as compared to the previous year 3,3 %;
- 2012 – 24 298 MW, growth as compared to the previous year 3,5 %;
- 2013 – 25 210 MW, growth as compared to the previous year 3,8 %;
- 2014 – 26 318 MW, growth as compared to the previous year 4,4 %;
- 2015 – 27 606 MW, growth as compared to the previous year 4,9 %.

As for the structure of electricity consumption during winter regime days, the most power-intensive group of customers is a non-regulated group, specifically domestic loads, lighting and customers with connected capacity up to 150 kW, who do not participate in regime measurements. The specific weight of these customers, from net, on the winter regime day of 2010 was 47 %.

The second-largest group by the amount of electricity consumed is industry. The weighed consumption industrial customers on a winter regime day was 39,8 % in 2010. The weighed consumption of transport customers was 6,1 %, and that of the municipal sector 5,1 %.

No significant changes in the weighed electricity consumption of the main groups of customers, from net, are forecast for 2011 – 2015.
Table 4 – Structure of expected electricity power consumption (net) in winter period (December) in Ukraine in 2011-2015

<table>
<thead>
<tr>
<th>Customer groups</th>
<th>Expected power consumption in December 2011 (MW)</th>
<th>% (-decline +growth) as compared to 2010</th>
<th>Expected power consumption in December 2012 (MW)</th>
<th>% (-decline +growth) as compared to 2011</th>
<th>Expected power consumption in December 2013 (MW)</th>
<th>% (-decline +growth) as compared to 2012</th>
<th>Expected power consumption in December 2014 (MW)</th>
<th>% (-decline +growth) as compared to 2013</th>
<th>Expected power consumption in December 2015 (MW)</th>
<th>% (-decline +growth) as compared to 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity consumption (net)</td>
<td>23 471,0</td>
<td>3,3</td>
<td>24 298,0</td>
<td>3,5</td>
<td>25 210,0</td>
<td>3,8</td>
<td>26 318,0</td>
<td>4,4</td>
<td>27 606,0</td>
<td>4,9</td>
</tr>
<tr>
<td>1. Industry including key sectors:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>1 250,0</td>
<td>4,3</td>
<td>1 273,0</td>
<td>1,8</td>
<td>1 301,0</td>
<td>2,2</td>
<td>1 333,0</td>
<td>2,5</td>
<td>1 373,0</td>
<td>3,0</td>
</tr>
<tr>
<td>Metallurgy</td>
<td>4 376,0</td>
<td>-0,1</td>
<td>4 472,0</td>
<td>2,2</td>
<td>4 619,0</td>
<td>3,3</td>
<td>4 827,0</td>
<td>4,5</td>
<td>5 113,0</td>
<td>5,9</td>
</tr>
<tr>
<td>Chemical and petrochemical</td>
<td>868,0</td>
<td>16,9</td>
<td>911,0</td>
<td>5,0</td>
<td>956,0</td>
<td>5,0</td>
<td>1 004,0</td>
<td>5,0</td>
<td>4 054,0</td>
<td>5,0</td>
</tr>
<tr>
<td>Machine-building</td>
<td>1 243,0</td>
<td>15,5</td>
<td>1 320,0</td>
<td>6,2</td>
<td>1 366,0</td>
<td>3,0</td>
<td>1 401,0</td>
<td>3,0</td>
<td>1 443,0</td>
<td>3,0</td>
</tr>
<tr>
<td>Construction materials</td>
<td>317,0</td>
<td>16,5</td>
<td>360,0</td>
<td>13,6</td>
<td>410,0</td>
<td>13,9</td>
<td>460,0</td>
<td>12,2</td>
<td>520,0</td>
<td>13,0</td>
</tr>
<tr>
<td>Food and food processing</td>
<td>589,0</td>
<td>5,1</td>
<td>603,0</td>
<td>2,5</td>
<td>621,0</td>
<td>3,0</td>
<td>652,0</td>
<td>5,0</td>
<td>685,0</td>
<td>5,0</td>
</tr>
<tr>
<td>Others</td>
<td>864,0</td>
<td>7,6</td>
<td>890,0</td>
<td>3,0</td>
<td>921,0</td>
<td>3,5</td>
<td>967,0</td>
<td>5,0</td>
<td>1 016,0</td>
<td>5,0</td>
</tr>
<tr>
<td>2. Agricultural customers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Transport</td>
<td>342,0</td>
<td>5,4</td>
<td>370,0</td>
<td>8,3</td>
<td>410,0</td>
<td>10,8</td>
<td>455,0</td>
<td>11,0</td>
<td>510,0</td>
<td>12,1</td>
</tr>
<tr>
<td>4. Construction</td>
<td>1 533,0</td>
<td>10,1</td>
<td>1 584,0</td>
<td>3,3</td>
<td>1 644,0</td>
<td>3,8</td>
<td>1 710,0</td>
<td>4,0</td>
<td>1 778,0</td>
<td>4,0</td>
</tr>
<tr>
<td>5. Municipal engineering</td>
<td>117,0</td>
<td>0,6</td>
<td>123,0</td>
<td>5,0</td>
<td>129,0</td>
<td>5,0</td>
<td>136,0</td>
<td>6,0</td>
<td>147,0</td>
<td>8,0</td>
</tr>
<tr>
<td>6. Lighting, domestic loads</td>
<td>1 183,0</td>
<td>1,2</td>
<td>1 207,0</td>
<td>2,0</td>
<td>1 225,0</td>
<td>1,5</td>
<td>1 249,0</td>
<td>2,0</td>
<td>1 274,0</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>10 790,0</td>
<td>1,0</td>
<td>11 186,0</td>
<td>3,7</td>
<td>11 613,0</td>
<td>3,8</td>
<td>12 122,0</td>
<td>4,4</td>
<td>12 691,0</td>
<td>4,7</td>
</tr>
</tbody>
</table>
1.8. Forecast sector development

1.8.1. Investment in new infrastructure

A mechanism has been established by the state to support the development of alternative energy by means of creating a special stimulating tariff, the so-called green tariff, implemented in Ukraine in 2009. This mechanism was introduced in order to attract investment in new generation capacity to produce electricity based on alternative energy sources. Since the adoption of the green tariff mechanism, 87 objects of alternative power generation have been put into operation in Ukraine.

Currently, a number of investment projects funded by the EBRD, IBRD, EIB and KfW are either in progress or are in preparation by the MECI.

Currently four investment projects are ongoing:

- Project for the modernisation and improvement of safety after completion of construction of power-generating unit No. 2 in Khmelnytska NPP and power-generating unit No. 4 in Ryvnenska NPP (total value – 125,0 million USD dollars: EBRD – 42,0 million USD and Euratom – 83,0 million USD);
- Construction of a 750 kV high voltage overhead line from Ryvnenska NPP to Kyivska (total value – 415,0 million Euro, EBRD credit – 150 million Euro and EIB – 150 million Euro);
- Electricity transmission project (total value – 238 million USD, EBRD loan – 200 million USD);
- Hydropower rehabilitation project (total value – 362 million USD, EBRD loan – 166 million USD).

Currently five investment projects are at preparation or initiation stage, with a total value of 1 405,03 million USD and 2 385,5 million Euro, including credits from the EBRD, IBRD, EIB and KfW at the amount of 1 995,5 million Euro:

- Construction of a 750 kV transmission line from Zaporyzka NPP to Kakhovska (total value 450 million Euro, EBRD credit – 175 million Euro and EIB credit – 175 million Euro);
- Project “Increasing efficiency of electricity transmission (Modernisation of substations)” (total value – 65,5 million Euro, KfW credit – 65,5 million Euro);
- Project for the rehabilitation of hydro generating capacities of OJSC “Ukrgyroenergo” (total value 690 million Euro, EBRD credit – 200 million Euro and EIB credit – 200 million Euro);

- Project concerning an aggregate programme to improve the safety of power-generating units of the Ukrainian NPPs (APS) (tentative value – 1 180 million Euro from EBRD and Euratom funds).

Preparation and initiation of five investment projects with a total value of 1 405,03 million USD and 2 385,5 million Euro are under way, including credits from the EBRD, IBRD, EIB and KfW in the amount of 1 995,5 million Euro:

- Project “Construction of a 750 kV transmission line from Zaporyzka NPP to Kakhovska” (total value 450 million Euro, EBRD credit – 175 million Euro and EIB credit – 175 million Euro);

- Project “Increasing efficiency of electricity transmission (Modernisation of substations)” (total value – 65,5 million Euro, KfW credit – 65,5 million Euro);

- Project for the rehabilitation of hydro generating capacities of OJSC “Ukrgyroenergo” (total value 690 million Euro, EBRD credit – 200 million Euro and EIB credit – 200 million Euro);

- Project of aggregate programme for improving safety of power-generating units of Ukrainian NPPs (APS) (tentative value – 1 180 million Euro from EBRD and Euratom funds).

The following projects are under development:

- Project “Construction of a 330 kV transmission line from Novoodeska to Artsys” (total value 1,5 billion UAH).

- Project “Construction of Kakhovska HPP -2” (value - 300 million Euro, possibility of financing the project from EBRD credit funds under the State guaranties is being considered).

- Electricity transmission project (second phase) (EBRD loan of 200,0 million USD.

- Project “Reconstruction of electricity lines of 0,4 – 110 kV and substations of OJSC “Krimenergo” (value – 170 million Euro possibility of financing the project from Export-Import Bank of China credit funds under the State guaranties is being considered).
1.8.2. Planned putting into operation / upgrading / decommissioning – the prospect for the period of 2011-2015

Long-term plans for upgrading generation are described by the following regulatory documents:

- Energy Strategy of Ukraine until 2030 (adopted by a Resolution of the Cabinet of Ministers of Ukraine of 15.03.2006, No. 145);

- Plan of reconstruction and modernisation of thermal power plants and combined heat and power plants until 2020 (approved by an Order of the Ministry of Fuel and Energy of Ukraine of 17.06.2010, No. 236);

- Sector programme for the reconstruction of hydro power plants and the construction of new facilities in hydro power generation until 2020 (approved by an Order of the Ministry of Fuel and Energy of Ukraine of 30.08.2010, No. 337).

Further long-term plans for the upgrading of generation are provided in a draft strategy document addressing the development of the electricity sector and the coal industry, titled “Updating the Energy Strategy of Ukraine until 2030 in the electricity sector” (endorsed by a Decision of the Board of MECI of 18.07.2011 – Order of MECI of 26.07.2011 No. 323).

On the basis of current state in the sector, with a view to support reliability of the Ukrainian UES and to ensure growth of national economy, the priority objectives of the Ukrainian the electricity sector are:

- Modernisation of available generating capacities (TPP with installation of flue gas treatment equipment (FGE), HPP, NPP, HSP);
- Modernisation and development of trunk and distribution networks;
- Completion of on-going projects of HPP and HSP construction;
- Construction of the third and fourth units in Khmelnytska NPP;
- Development of alternative and renewable sources of energy (RES);
- Construction of 6 GW of coal-fired power plants to replace redundant capacity.
By 2030, the updated Energy Strategy estimates the development 3 – 4 GW of wind generation capacity, 1.5 – 2.5 GW of solar capacity, 0.4 – 0.8 GW of small hydro capacity, bringing the total RES generation capacity to ca. 7 GW.

NEC “Ukrenergo” has issued seven technical specifications for the connection of wind power plants to trunk electricity networks in the AR Crimea and Zaporizhia Oblast, with total capacity of 1 700 MW. Circuit solutions on connection of six wind power plants with an aggregate capacity of 1 650 MW have been already agreed. Proposals for connecting a number of wind power plants with an aggregate capacity of up to 3 000 MW being considered. Technical specifications for connecting solar power plants on photoelectric cells with aggregate capacity of 448 MW have also been issued.

1.8.3. Planned generation projects for 2011 – 2015

According to the Plan of upgrading TPP and HPP by 2015, it is planned to put into operation (after reconstruction):

- units No. 3, No. 4 and No. 5 with a capacity of 315 MW each in Zaporyzska TPP (in 2013, 2014 and 2015 respectively);
- units No. 9 and No. 7 (150 MW each), No. 14 (310 MW), No. 11 and No. 13 (315 and 310 MW) Prydnyprovskaya TPP (in 2012, 2014, 2014, 2015 and 2015 respectively);
- units No. 3 (300 MW), No. 1, No. 9, No. 5 and No. 6, 315 MW each in Kryvoryzkaya TPP (in 2012, 2013, 2013, 2015 and 2015 respectively);
- unit No. 13, 210 MW in Starobeshivska TPP in 2014;
- units No. 7 (206 MW), No.5 (208 MW), No.9 (210 MW) and No.10 (208 MW) in Burshtynska TPP (in 2012, 2013, 2015 and 2014 respectively);
- units No. 4 and No. 5, 310 MW each in Ladyzhynska TPP in 2014 and 2015 respectively;
- units No.1 and No. 2, 325 MW each in Trypylska TPP in 2014;
- units No. 1 (205 MW) and No. 9 (320 MW) in Zmyivska TPP in 2014 and 2015 respectively;
- units No. 3 and No. 4, 315 MW each in Zmyivska TPP in 2014 and 2015 respectively;
- units No. 8, No. 6, No. 9, No. 4, 220 MW each in Kurakhivska TPP in 2012, 2013, 2014, 2015 respectively;
- units No. 10, No.13, No.11, No.15 210 MW each in Luganska TPP in 2012, 2013, 2014 and 2015 respectively.

By 2015, it is planned to complete the construction of the first stage of Dnystrovskaya HSP, with a capacity of 972 MW, to put into operation one generating unit at the Kakhovska HPP-2, with a capacity of 58 MW, and one generating unit with capacity of 250 MW in Kanyvskaya HSP; in Western regions of Ukraine, to construct 200 MW of new small HPP capacity, and by 2017 to increase by 245,2 MW the installed capacity of HPPs by implementing a second stage of reconstruction of existing hydro-electric generating units.

1.9. Operating safety of networks (transmission / distribution), monitoring the quality of customer service

With a view to control the quality of customer service by every Ukrainian electricity supplier under regulated tariff, the NERC approved its Resolution No 232 «On Approval of reporting forms No 17-NERC (quarterly) «Report on commercial quality indicators of customer service» and instructions for filling them out» of 17.02.2011. It has empowered the NERC to insure the control of following the quality indicators of electricity service by electricity suppliers under regulated tariff in Ukraine. These quality indicators of customer service have been approved by the resolution of NERC No 573 of 07.04.2011. The collection of monitoring indicators gives information about the level and quality of customer service in the electricity sector.

In order to improve the situation, measures to increase the operational reliability of electricity networks and the quality of services will be taken by decreasing the number of both technical break-downs and planned disconnections in the electricity networks. This can be achieved by replacing morally and physically obsolete equipment with modern devices, which require much less minimal maintenance; by taking organisational and technical measures to reduce the effects of adverse weather conditions and natural phenomena on the operational reliability of electricity networks. There are on-going activities to improve the quality of customer service in Ukraine, but it will require considerable investments and time to reach the standards of developed economies.

Further, in order to improve the quality of customer service in the electricity sector, the central offices of large electricity suppliers under regulated tariff and their major local branches should have been required to establish information and consulting
centres (ICCs), staffed by trained specialists. With the help of ICCs, customers are able to efficiently solve in practically any matters and problems relevant to their electricity supply. Customer complaints submitted to ICCs are considered jointly by the staff of electricity-supplying companies, the NERC and the State Energy Supervision Body of Ukraine (Derzhenergonaglyad). After the ICCs were created, the number of complaints from the public to local and central authorities regarding connection to electricity networks, substandard service, unsatisfactory state of equipment etc. has substantially decreased.

In order to reduce technical losses of electricity (TLE), investment programmes implemented by electricity suppliers under regulated tariff help to decrease or eliminate non-technical electricity losses, in particular, by improving electricity accounting systems and practices at customer premises, and by improving the efficiency of work done by company staff in collecting metering and other useful information from customers. The above said measures have positively affected the existing situation.
2. GAS SECTOR

2.1. Key players in the market and their obligations

The key state entities in charge of managing the natural gas sector of Ukraine are the Cabinet of Ministers of Ukraine, the Ministry of Energy and Coal Industry of Ukraine (MECI), and the National Electricity Regulatory Commission of Ukraine (NERC).

State management of the gas sector is entrusted to the Ministry of Energy and Coal Industry of Ukraine, whose main responsibilities comprise of establishing development priorities and ensuring normative and legal regulation in the fuel and energy sector, development and improvement of relationships between the participants in the natural gas market, development of target programmes, in particular, programmes related to the diversification of natural gas supply, and exercising the state's rights to monitor the sector.

State regulation of the activities of entities in the natural gas market shall be exercised by NERC. The main responsibilities of the NERC, include in particular:

- approval of license conditions for exercising certain types of commercial activities in the natural gas market and the execution of control over observance of these license conditions by licensees;

- approval of a procedure for access to the unified gas transport system of Ukraine;

- securing the implementation of tariff and pricing policy in the natural gas market;

- approval of a procedure for establishing and reviewing tariffs for services of transport, distribution, supply, injection, storage and withdrawal of natural gas;

- approval of methodologies for tariff calculation for services of transport, distribution, supply, injection, storage and withdrawal of natural gas;

- promotion of competition in the natural gas market.

The full cycle of operations for gas field exploration and development, production and exploratory drilling, gas transport and storage, supply of natural gas and LPG to customers is done by NJSC “Naftogaz of Ukraine” (Naftogaz), which is a vertically integrated oil and gas company subordinated to the MECI. More than 97 % of oil and gas extracted in Ukraine are produced by Naftogaz or its subsidiaries.
Naftogaz refines gas, oil and condensate at five gas processing plants (GPP) which integrated in the company, producing liquefied gas, motor fuels and other types of oil products there. The company also owns a chain of filling stations.

Naftogaz is organised as follows:

- Subsidiary companies (SC) – Ukrgasproduction, Ukrtransgaz, Gas of Ukraine;
- Subsidiary enterprises (SE) – Ukraftogazkomplekt, Ukravtogaz, Naftogazbezpeka; Production and marketing enterprise (PME) Naftogaz, Naukanaftogaz, LIKVO;
- Public joint-stock companies (PJSC) – Chornomornaftogaz, Ukrspetstransgaz, Ukrnafta, Ukrtransnafta.

2.2. Legal and regulatory framework

The principal legal framework of the sector comprises:

- The Law of Ukraine of 08.07.2010 No. 2467 On the Principles of Functioning of the Natural Gas Market;
- The Law of Ukraine of 16.06.2011 No. 3533 On Supporting of Commercial Accounting of natural gas;
- The Law of Ukraine of 12.07.2001 No. 2665 On Oil and Gas;
- The Law of Ukraine of 15.05.1996 No. 192 On Pipeline Transport.
- The Law of Ukraine of 01.06.2000 No. 1775 On Licensing of certain economic activities

2.3. Description of the sector: consumption structure, imports and exports

Ukraine has considerable amounts of locally extracted gas, but it also imports gas of Russian origin.
The total volume of natural gas consumption in 2010 was 57,72 bcm. Gas imports during the same period were 36,5 bcm.

During 2011, Russian gas imports reached ca. 44,8 bcm. The total expected volume of gas consumption in 2011 is 59,3 bcm.

Table 5 – Structure of natural gas distribution budget for 2011, %

<table>
<thead>
<tr>
<th>Sector</th>
<th>Budget share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial enterprises</td>
<td>46,5</td>
</tr>
<tr>
<td>Households</td>
<td>28,8</td>
</tr>
<tr>
<td>Municipal heat and energy companies</td>
<td>14,0</td>
</tr>
<tr>
<td>(Teplocomunenergo)</td>
<td></td>
</tr>
<tr>
<td>SC “Ukrtransgaz”</td>
<td>7,5</td>
</tr>
<tr>
<td>Oblgazes</td>
<td>1,7</td>
</tr>
<tr>
<td>Budgetary institutions (public entities)</td>
<td>1,5</td>
</tr>
</tbody>
</table>

Ukraine did not export natural gas in 2011.

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As of the moment of drafting of this Statement, statistical data for 2011 on the energy sector of Ukraine results were still under preparation.
2.4. Storage

Ukraine possesses 13 underground gas storage facilities (UGS). Active volume of Ukraine's gas storage facilities is 31.95 bcm, with maximum volume of gas withdrawal of 250 bcm/day. The major part of storage capacity (up to 80%) is located in Western Ukraine near the end sections of the Ukrainian part of the main transit gas pipelines – “Soyuz”, “Progress”, “Urengoy-Pomary-Uzhgorod”. The geology of the existing UGS allows, if needed, an increase of active capacity by 4 bcm.

The Ukrainian UGS facilities are intended for:

- regulation of seasonal non-uniformities in gas consumption;
- providing additional gas supply to customers during extreme temperature drops, both on given days and during periods of abnormally cold winters;
- arrangement of considerable reserves of gas for overcoming unexpected situations, like long-term termination of gas supply due to dramatic accidents, natural calamities etc.;
- creating gas reserves for cases of short-time disruptions in the gas supply system;
- securing reliable gas transit.

The Ukrainian gas storage facilities ensure reliable gas supply to the European market. This UGS may be used not only for covering seasonal irregularities in consumption, but also for the creation of strategic reserves to secure customers in Western and Central Europe, the Balkans and Turkey.

On 1.9.2011, the Ukrainian UGS held ca. 19.2 bcm of natural gas.

2.5. Gas transport system of Ukraine

2.5.1. General description

The gas transport system (GTS) of Ukraine serves two major functions: gas transit through the territory of Ukraine to European countries and natural gas transportation for Ukrainian customers. It is closely linked to gas transport systems of the neighbouring European states – Poland, Belarus, Russia, Romania, Moldova, Hungary, Slovakia being integrated through it with the European gas network.
The Ukrainian GTS is be divided, by main gas transport directions, into three corridors.


The second corridor – Southern direction, includes gas pipelines “Shebelynka - Dnipropetrovsk - Kryvyi Rig - Izmail”, “Yelets - Kremenchuk - Kryvyi Rig”, “Kremenchuk – Ananyiv” and “Ananyiv – Tiraspyl – Izmail”.

The third corridor – a system of gas transport pipelines “the Northern Caucasus – Centre” through which gas was transported to the Southern Russia (today this direction is no longer used as a transit corridor).

The GTS is capable to accept a feed of up to 290 bcm of natural gas and to transfer 178 bcm to exits, including 142 bcm to Western and Central European countries. Approximately 80 % of Russian gas is supplied to Europe through Ukraine.

The gas transport system of Ukraine includes 39 800 km of gas transport pipelines of various purpose and capacity, 74 compressor stations (CS), more than 1 600 gas distribution stations, 13 underground gas storage facilities (UGS) and infrastructure facilities that support the functioning of the system.

Transport of gas by the system of gas transport pipelines and its pumping into UGS is secured by 112 compressor stations where 713 gas compressor stations are installed with total capacity of 5 400 MW.

As of the beginning of 2011, the total length of the gas transport pipelines with pressure of up to 1,2 MPa was 367 400 km, 263 600 km of which were distribution pipelines and 103 800 km building lines. Polyethylene pipes represent ca. 25 % (91 800 km) of all gas transport pipelines. 63 600 of gas metering points support needed gas supply regime.

2.5.2. Natural gas transit

According to the terms and conditions of the Amendment of November 2010 to Contract No. KII of 19.01.09 between Naftogaz and OJSC “Gazprom” on the sale of natural gas in 2009 – 2019, the volume of imported natural gas in 2011 shall amount to 41,6 bcm, and the Minimum Annual Quantity (MAQ) which Naftogaz shall take and pay for, or pay for without taking it, shall be to 40 bcm.
According to Article 2 p. 2.2 of the Contract, starting from 2012, the volume of imported natural gas shall amount to 52,0 bcm, and MAQ shall be to 41,6 bcm.

Since the second half of 2011 Naftogaz has been making the working consultations together with OJSC “Gazprom” to define the MAQ of gas for Ukraine in 2012 onwards, taking into account the common needs of the Ukrainian economy in natural gas.

On 17 June 2011, the Verkhovna Rada adopted the Law of Ukraine “On amending the Law of Ukraine On the Principles of Functioning of the Natural Gas Market”. With the adoption of this law, Naftogaz is entitled to keep the gas it has extracted, on the basis of volumes approved by the Cabinet of Ministers of Ukraine.

Currently, the volumes of natural gas exports for 2011 – 2012 have not been approved by the Government of Ukraine and no gas exports are taking place.

During 2011, gas transit through the territory of Ukraine amounted to 104,2 bcm, which is 5,6 bcm or 5,7 % more than during 2010.

2.5.3. Forecast volumes of natural gas consumption in 2012 – 2013

Taking into account the situation in the Ukrainian gas market and the request of the President of Ukraine and the Ukrainian Government regarding expected decrease in gas consumption and increase in the volumes of alternative types of fuel in the near future, the expected use of natural gas in Ukraine should be ca. 55,5 bcm in 2012 and 53,0 – 53,5 bcm in 2013.

2.5.4. Forecast volumes of natural gas extraction in 2012 – 2013

The extraction of gas by Naftogaz in 2011 is 18,113 bcm. The expected gas extraction volumes are established at 18,355 bcm for 2012, and 18,863 bcm for 2013.

Prognosed annual volumes of natural gas extraction by private companies is ca. 2,4 – 2,5 bcm.

2.6. Security of supply and functioning of the sector in case of emergency

According to the provisions of CMU Resolution No. 1729, of 27.12.2001, “On supplying customers with natural gas”, natural gas suppliers must ensure a security gas reserve at the amount of 10 % of quarterly contractual supply volumes to customers, in a natural form, in addition to what is used for their own purposes. Such natural gas, pumped into UGS in accordance with an approved budget prognosis for
its delivery and distribution in Ukraine, shall constitute the security reserve of gas which covers the demand of Ukrainian customers.

The monitoring of reliability of gas supply is exercised on the basis of the above-mentioned CMU Resolution and the provisions of the Law of Ukraine *On the Principles of Functioning of the Natural Gas Market*. The operator of the Ukrainian GTS shall annually prepare a budget prognosis of income and distribution of natural gas, and natural gas suppliers account for natural gas sold and report monthly their income on gas sold, and the situation in marketing and the creation and use of the security gas reserve.

In case of emergency, the activities of the participants in the gas sector are organised in accordance with the procedure with Article 18 of the Law of Ukraine of 15.05.1996 No. 192 *On Pipeline Transport*.

The list of actions to be undertaken in emergency situations must include activities related to repairs after natural disasters (floods, fires, avalanches etc.) and the failures and accidents caused by them and resulting in disruptions of pipeline transport.

The GTS of Ukraine is closely interconnected with the gas transport systems of Russia, Belarus, Poland, Slovakia, Hungary, Romania and Moldova, and is integrated through them with the greater European gas network. Within the framework of a mutual assistance mechanism, Ukraine may obtain and deliver gas from and to the national gas storage facilities of Poland, Slovakia, Hungary and Romania.

2.7. Gas sector reform and modernisation of existing capacity

To meet its obligations provided in the Treaty Establishing the Energy Community, Ukraine has begun to reform its gas sector.

In pursuance of an order of the President of Ukraine, of 2.9.2011, within the framework of activities in the reform area “Reform of the oil and gas industry”, the development of a programme to reform Naftogaz has been initiated, which in particular shall include:

- an inventory of assets of Naftogaz and its subsidiary enterprises, providing also a separation of the assets in core and non-core assets;

- proposals regarding the future use of non-core assets of Naftogaz and its subsidiaries;
• proposals for an implementation model for the functioning of state enterprises the oil and gas sectors.

Within the above-mentioned framework, Naftogaz is now being prepared for division into three separate, independent activities: transportation, extraction and supplying.

The relevant draft law, which would give the CMU the authority to reform Naftogaz has already been submitted to the Verkhovna Rada for consideration and adoption.

The NERC has implemented a series of measures aimed at a systematic transition from the current market structure to an open natural gas market, in particular:

• In pursuance of Article 4, point 3, of the Law of Ukraine *On the Principles of Functioning of the Natural Gas Market* (the Law) and a "Plan to organise drafting of regulations necessary for the enforcement of the Law of Ukraine “On the Principles of Functioning of the Natural Gas Market” (the Plan), NERC adopted Resolution No. 466, of 31.03.2011 “On Approving a Procedure of Setting Retail Prices for Natural Gas Sold to Households”.

• In pursuance of Article 4, part three, point 15, of the Law, and point 2 of the Plan, the NERC adopted:
  - Resolution No. 212 of 10.02.2011 “On Approving a Standard Contract for Buying-Saling of Natural Gas (between owners and suppliers)”;
  - Resolution No. 469 of 31.03.2011 “On Approving a Standard Contract for Distribution of Natural Gas”;  
  - Resolution No. 1074 of 23.06.2011 “On Approving a Standard Contract for the Storage (Injection, Storage, Withdrawal) of Natural Gas”;  

• The NERC has also been completing the work on approval the following important acts for the Ukrainian gas market:
  - Draft Resolution “On Approving the Accession Rules to the Ukrainian Gas Transportation System”;  
  - Draft Resolution “On Defining Eligible Natural Gas Customers”.
To have these legislative acts approved the NERC has taken all necessary measures, including the common consultations with both local and European experts during 2011.

The current programme of economic reforms in the area of “Oil and gas industry reform” provides for transition from current mechanism of price differentiation within certain groups of customers to common prices applicable to all.

The NERC currently is making the necessary calculations for a stage-by-stage transition from the existing mechanism of price differentiation for households and certain groups of customers to common prices for natural gas.

Ukraine emphasises its significant efforts to implement the agreements referred to in the signed Common Statement which confirms the results of the Investment Conference on the Modernisation of the GTS of Ukraine, held in Brussels on 23.3.2009.

At the Conference, Ukraine presented a Master Plan for the modernisation of its GTS, based on primary and priority projects for modernising the transit sections of the GTS with their further stage-by-stage implementation.

In order to implement the provisions of the Common Statement, the MECI and Naftogaz cooperate with the experts of the European Commission and the IFIs (IFC, EBRD and EIB).

On 18.2.2011 Naftogaz concluded an agreement with the EBRD on the provision of grant funds to obtain consultancy services from Mott McDonald regarding the development of a preliminary study for the modernisation of Ukraine's transit and underground gas storage system in.

The EBRD has also approved the concept of the project “Modernisation and reconstruction of the Urengoy-Pomary-Uzhgorod trunk gas pipeline”.

Considering the need of securing a proper level of reliability of the “Urengoy-Pomary-Uzhgorod” trunk gas pipeline, the management of Naftogaz decided to finance the activities of the “Reconstruction of outside facilities of Urengoy-Pomary-Uzhgorod gas pipeline (I stage)” project at its own expense in 2011.

On 19.7.2011 an official joint welding ceremony was held at the junction of the “Urengoy-Pomary-Uzhgorod” pipeline, marking the beginning of modernisation and reconstruction of the Ukraine's GTS.

EBRD and EIB have confirmed that the may provide further funding for the “Urengoy-Pomary-Uzhgorod” pipeline, which is reflected in a memorandum between Naftogaz and EBRD concerning project preparation regarding the modernisation and reconstruction of said gas pipeline, and a letter of intent between Naftogaz and EIB.
3. OIL SECTOR

3.1. Key players in the market and their obligations

The key state entities in charge of managing the oil sector of Ukraine are the Cabinet of Ministers of Ukraine, the Ministry of Energy and Coal Industry of Ukraine (MECI), and the National Electricity Regulatory Commission of Ukraine (NERC).

State management of the gas sector is entrusted to the Ministry of Energy and Coal Industry of Ukraine, whose main responsibilities comprise of establishing development priorities and ensuring normative and legal regulation in the fuel and energy sector,

making decisions about the test and full commercial operation of underground storage facilities for oil and oil products, making decisions about test and full commercial operation of oil fields and joint oil and gas deposits, issuing permissions for the decommissioning trunk oil product pipelines, approval of a list of standard losses and manufacturing consumption of oil in extraction processes, preparation for transit and transport, procedure for determination of their values and keeping records, monitoring oil and oil product markets, and development of budget prognoses for oil and oil products.

State regulation of entities in the oil market is exercised by the NERC, whose main responsibilities include securing the implementation of pricing and tariff policies in the oil sector, ensuring the efficient functioning of commodity markets, protection of the rights of oil and oil product customers, and coordinating activities of state authorities in matters relating to market regulation in the sector.

The full operating cycle, consisting of exploration and exploitation of deposits, production and exploration drilling, oil transport and storage, and supply of oil products to customers, is performed by Naftogaz.

3.2. Legal and regulatory framework

Basic legal, economic and organisational principles applicable to the Ukrainian oil sector are provided in the Law of Ukraine of 12.07.2001 No. 2665 On Oil and Gas.

The quality of oil products is defined by the following Ukrainian state standards (DSTU):

- 3437-96 “Oil products. Terms and definitions”;
- 3868-99 “Diesel fuel. Technical specifications”;
- 4839:2007 “Motor petros of advanced quality”; 
- 4840:2007 “Diesel fuel of advanced quality”.

3.3. Description of the sector

3.3.1. Description of internal and external sources

The initial extractable oil deposits of Ukrainian oilfields amount to 421,9 million tons of crude oil and of 138,6 million tons of gas condensate.

Most oilfields have initial extractable deposits of less than 1 million tons, and only six of them (Bugruvatyvske, Glynsko-Rozhbyshhevsk, Boryslavske, Gnydyntsivske, Dolynske, Lelyakyvske) have initial deposits exceeding 20 million tons, providing ca. 22 % of Ukraine's total oil extraction.

More than 70 % of Ukraine's oil deposits are below the level of exhaustion, with water encroachment, high viscosity, difficult collecting properties must be categorised as deposits which are difficult for extraction. They should be classified as low-lying collectors, multilayer, with high lithologic nonuniformity both in terms of the area and the thickness of productive cross-sections. Two thirds of deposits are in oilfields occurring below 2 500 m.

3.3.2. Extraction and refining

The total volume of oil and gas condensate extracted by Naftogaz enterprises in 2011 was 3 038 100 tons.
Figure 4 – Extraction of oil and gas condensate in Ukraine

During the first 11 months of 2011, the petroleum refineries (PR) and Shebelynskyi gas processing plant (GPP) were supplied 780 750 tons of oil stock, of which 624 000 tons of gas condensate of domestic extraction were delivered to Shebelynskyi GPP.

Figure 5 – Results of oil stock refining and oil products manufacture in Ukraine

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3 As of the moment of the Statement development, statistical data for 2011 related to Ukrainian energy sector results were under preparation.

4 As of the moment of the Statement development, statistical data for 2011 related to Ukrainian energy sector results were under preparation.
Table 6 – Oil refining by Naftogaz enterprises (oil and oil products extracted and produced by Naftogaz)

<table>
<thead>
<tr>
<th>Showing</th>
<th>2010 (1 000 tons)</th>
<th>2011 (1 000 tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas condensate and oil refinement</td>
<td>660,20</td>
<td>680,33</td>
</tr>
<tr>
<td>Production:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petrol, total</td>
<td>368,93</td>
<td>390,71</td>
</tr>
<tr>
<td>Diesel fuel</td>
<td>172,50</td>
<td>177,19</td>
</tr>
<tr>
<td>White spirit</td>
<td>13,05</td>
<td>6,11</td>
</tr>
<tr>
<td>Heavy fuel oil (mazut)</td>
<td>73,08</td>
<td>67,97</td>
</tr>
<tr>
<td>Liquefied gas</td>
<td>374,85</td>
<td>376,78</td>
</tr>
<tr>
<td>Pitch mineral</td>
<td>1,91</td>
<td>3,44</td>
</tr>
<tr>
<td>Light fractions</td>
<td>190,22</td>
<td>159,06</td>
</tr>
</tbody>
</table>

3.3.3. Import and export

Ukraine's oil demand is ca. 28 million tons. Domestic extraction covers around 15 – 18 % of this demand. 85 – 90 % of oil supply to GPPs is imported from Russia and Kazakhstan and is delivered as mixture referred to as URALS brand, via an existing system of oil pipelines trough the territory of Russia.

Other imported oil brands – Azerbaijani “Azeri Light” totalled 704 700 tons in 2011. Kazakh oil was not supplied to Ukrainian GPPs in 2011.

The potential oil suppliers to Ukraine include, beyond the traditional partners – Russia and Kazakhstan – Azerbaijan and Turkmenistan.

The oil transhipment facility at the port of Pyvdennyi and the Odesa-Brody oil pipeline make imports also from other sources, such as the Caspian, the Persian Gulf and West Africa, technically feasible.

There were no export or import transactions for crude oil or oil products by Naftogaz enterprises in 2010 – 2011.
3.4. Infrastructure of the sector and technical safety

3.4.1. Description of the oil transport system

The system of Ukraine’s trunk oil pipelines is operated by OJSC “Ukrtransnafta”. It consists of 19 trunk oil pipelines with a total length of 4,767.1 km of pipes (as single run) with diameter up to 1,220 mm, 51 oil transfer stations, 11 tank farms with 79 reservoirs of total rated capacity 1,083,000 m³. Operation of oil transfer stations is supported by 176 pump units with capacity up to 12,500 m³/h with a total power of 356,500 kW for electric drivers.

The flow rate of the Ukrainian trunk pipeline system at the input equals to 114 million tons/year, at the output to 57.6 million tons/year.

Figure 6 – Volumes of oil transfer by OJSC “Ukrtransnafta” enterprises

During the first 11 months of 2011⁵, the share of transit volume of oil transfer of the total volume of oil transfer was 64.6 %, while the share of oil transfer to Ukrainian refineries was 35.4 %.

⁵ As of the moment of the Statement development, statistical data for 2011 related to Ukrainian energy sector results were under preparation
3.4.2. Transit routes

Major changes are happening in the structure of oil supply sources to Europe. According to forecasts, annual oil exports from the Caspian countries will increase up to 100 – 150 million tons (2 – 3 million barrels per day) within the next ten years. This is 4 – 6 times more than today’s volumes.

The Odesa-Brody oil transport system can be a solution to overcome the limitations of the Bosphorus. The Odesa-Brody pipeline and the Pivdennyi sea terminal are ready to receive and transport oil further to Ukrainian and European refineries. The oil pipeline could also be used for transit of Caspian oil into Eastern Europe, bypassing the territory of Russia, with an option to reach Baltic Sea ports (via Plock - Gdansk).

Table 7 – Technical specifications of the Odesa-Brody oil transport pipeline

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>674 km</td>
</tr>
<tr>
<td>Diameter</td>
<td>1020 mm</td>
</tr>
<tr>
<td>Initial rate of flow</td>
<td>14.5 million tons</td>
</tr>
<tr>
<td>Rate of flow after II stage commissioning</td>
<td>45.0 million tons</td>
</tr>
<tr>
<td>Main pumping stations</td>
<td>1</td>
</tr>
<tr>
<td>Number of pumping stations after the commissioning of Stage II</td>
<td>3</td>
</tr>
<tr>
<td>Deadweight of tankers</td>
<td>Up to 100 000 tons</td>
</tr>
<tr>
<td>Capacity of tank farm of Stage I</td>
<td>200 000 m³</td>
</tr>
<tr>
<td>Capacity of tank farm after the commissioning of Stage II</td>
<td>600 000 m³</td>
</tr>
</tbody>
</table>

On 17 January 2011 OJSC “Ukrtransnafta” and the Belarusian oil company agreed on the provision of services to transport light oil at the amount of 4 million tons/year via the Odesa-Brody oil pipeline until 2013. The Contract provides for guarantees of transit of at least 4 million tons/year, with possible increase to up to 8 million tons/year. On 13 February 2011, regular transport of Azeri Light brand by the Odesa-Brody pipeline started in reverse mode. At the beginning of pumping, the Odesa-Brody and Druzhba pipelines were filled with technical oil (430 000 tons and 120 000 tons respectively). As Caspian crude oil arrives, Russian oil will be removed from the pipelines and used for further processing in Belarusian refineries.
The Caspian oil supply in reverse mode increases the utilisation rate of Ukraine's oil transport system and strengthens the energy security of Ukraine, the other countries of the region and Europe as a whole. It also confirms the role of Ukraine as a reliable transit country and strengthens its status as one of the key partners in the process of diversification of energy supply in the Caspian-Black Sea region.

3.4.3. Oil refining

The production of oil and gas condensate and the processing of oil products take place at six refineries and one gas processing plant (GPP) in Ukraine:

- PJSC “Ukrtatnafta” (Kremenchutskyi refinery):
  The capacity of the refinery is ca. 18.6 million tons of crude oil per year. Oil is supplied by the following oil pipelines: Gnydyntsy – Glynsko-Rozbysyvske – Kremenchuk (crude oil of East Ukrainian origin); Samara – Gologvashyvka - Kremenchuk and Samara – Lysychansk – Kremenchuk (crude oil from Russia and Kazakhstan). Also Azeri oil is used.

- “LiNOS” LLC (Lysychanskyi refinery):
  The capacity of the refinery is approximately 8.0 million tons of crude oil per year. Oil is supplied by the Samara – Lysychansk pipeline.

- PJSC “Khersonnaftopererobka” (Kherson refinery):
  The capacity of the refinery is ca. 7.1 million tons of crude oil per year.

- PJSC “Lukoil – Odeskyi refinery”:
  The capacity of the refinery is approximately 2.8 million tons of crude oil per year.

- PJSC “Oil-refining complex Galychyna”:
  The capacity of the refinery is ca. 3.5 million tons of crude oil per year.

- PJSC “Naftokhymyk Prykarpattya”:
  The capacity of the refinery is approximately 2.6 million tons of crude oil per year.

- Shebelynskyi GPP (in the structure of SC Ukrgasproduction).

Currently, the total capacity of the six Ukrainian oil-processing enterprises for initial oil refining is in excess of 51 million tons of oil per year.
3.5. Development and modernisation of the sector

3.5.1. Forecast features

According to the basic development scenario, the volumes of domestic extraction of oil and gas condensate will increase to 5.3 million tons/year in 2015. After that, extraction from domestic oil fields is expected to stabilise at the level of 5.4 million tons/year. According to an optimistic forecast, extraction will reach 5.5 million tons/year, while a pessimistic scenario provides 4.7 million tons/year.

Considering that refinery volumes are expected to ca. 85 % of the current levels, it is planned to increase, by 2030, the production volumes of the main oil product types, including: petrol – to 11.5 million tons, diesel fuel – to 17.2 million tons, jet engine fuel – to 1.5 million tons. The production of heavy fuel oil (mazut) is expected to decrease to 5.7 million tons.

Based on the prospective demand for oil and forecast levels of oil and gas condensate extraction in Ukraine, oil imports Ukraine are expected to amount of 26.7 million tons in 2015.

A gradual increase of transit volumes is planned by means of stage-by-stage integration of the Druzhba and Adrian oil pipelines (additional transport of 5 – 15 million tons by Druzhba), and also the construction of Brody (Ukraine) – Plock (Poland) oil pipeline and stage-by-stage implementation of the EAOTC (Europe-Asia Oil Transport Corridor) project to reach a volume of 20 million tons from the Caspian region (Kazakhstan, Azerbaijan) and the Persian Gulf (Iran, Iraq and others) by 2015.

3.5.2. Diversification of supply sources

The EAOTC project provides for the creation of a new corridor for oil transit from the Caspian region to Ukraine and further to European markets, bypassing the overburdened Turkish straits.

This project is being implemented within the framework of the International Pipeline Company “Sarmatia”, with the participation of the State Oil Company of the Azerbaijani Republic, Georgian Gas and Oil Corporation, Lithuanian Company “Klaipedos Oil”, oil transport companies PERN “Przyjaźń”, Poland and OJSC “Ukrtransnafta”.

At the moment, the main efforts of the IPC “Sarmatia” in implementing the EAOTC project are focused on obtaining financing from the EU Operational Programme “Infrastructure and Environment” funds for the purpose of implementing the oil pipeline to connect Ukrainian and Polish oil transport systems (Brody - Plock).
The European Commission chose the Oil and Gas Institute of Krakow, Poland, as the second level coordinator for the Programme “Infrastructure and Environment”, which shall monitor whether IPC “Sarmatia” has met the terms and conditions for EU financing.

The framework of activities of IPC “Sarmatia” include:

- preparation completed of the draft Feasibility study for the project of Brody – Plock oil pipeline construction and the request for the Project financing;
- the study completed on choice of the pipeline route. The length of the route is 371 km from the Line production and the Brody dispatch station to Adamova Zastava, Poland, including 120 km in Ukraine and 251 km in Poland.

The implementation of the construction project Brody – Plock oil pipeline is executed according to the schedule agreed with the Oil and Gas Institute of RP, without significant delays that could affect the prospects of its realisation.

Today IPC “Sarmatia” is working on signing cooperation agreements for the project implementation with self-administration bodies of the regions in the Republic of Poland through the territories whereof the route of the Brody – Plock oil pipeline will go.

The first meeting of the Ukrainian-Polish working group was held in Warsaw on 7 November 2011 to consider the issues related to the extension of the Odesa – Brody – Plock – Gdansk pipeline.

Within the framework of the first stage of EAOTC project implementation, OJSC “Ukrtransnafta” is working now on organisation of light Caspian oil supply by “Odesa – Brody” oil pipeline and of different brands of oil supply by Druzhba system towards Czech refineries in the towns of Kralupy and Litvinov, with the prospects of extension to the Austrian refinery in Schwechat and German refineries in Bavaria.

3.6. Technical safety of oil transport system and security of supply

Basic requirements of technical safety of the oil transport system are stipulated in the Rules of safety in oil and gas extraction industry of Ukraine (approved by the Order of the State Committee of Ukraine on Industrial Safety, Job Safety and Mining Surveillance of 06.05.2008 № 95).
The Rules set forth safety requirements during the construction and operation, major repairs and exploration of oil, gas and other oil and gas extraction related boreholes, industrial collection of oil, preparation of oil and gas for transport by trunk pipelines.

To prevent occurrence of crisis situations in the oil products market, the Resolution of the Cabinet of Ministers of Ukraine of 08.12.2009 No. 1498 adopted the Concept of creating in Ukraine minimum oil and oil products stock by 2020.

The goal of the concept is to increase the level of energy security of Ukraine by establishing an efficient system of protection of the national economy from lowering volume of oil and oil products supply or its termination.

Reaching of the said goal provides for the creation of minimum stocks which taking into account domestic oil extraction, shall guarantee availability of 90-days volume for internal oil and oil products consumption, meeting the EU standards as defined by the Council Directives 68/414/EEC, 2006/67/EC imposing an obligation on Member States of the EEC to maintain minimum stocks of crude oil and/or oil products and to ensure their storage, renewal and use.

Implementation of the Concept will allow, in the first place, to secure the proper functioning of Ukraine's fuel and energy sector during periods of potential crisis in the international oil and oil product markets, as well as to substantially lower the degree of dependence of the domestic oil and oil products market on fluctuations in international markets.