

# **HOMELAND SECURITY**



# CHALLENGES FOR THE UKRAINIAN ENERGY INDUSTRY

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## **Abstract**

*Reform of the energy sector is very important, both for the Ukrainian economy and for the reputation of Ukraine in Europe. Since independence, the energy sector, and especially the gas sector, has been totally in transparency and a major area of corruption. Energy is the most important component of Ukraine's economy and energy security is one of the weakest links in the state's national security strategy.*

**Key words:** Energy sector, solution, Ukraine, economy, corruption.

## **Introduction**

Ukraine is one of the largest countries in Europe, whose area and population (over 47 million in size) measure somewhere between those of France and Spain. Vast fossil fuel resources and the unwise policies of the past historical period, when energy intensity had been considered a sign of economic growth, are among the main reasons that have led to a situation which has not always seen effective development of the Ukrainian energy sector. Obviously, the situation, as described above, is incompatible with the promising economic opportunities provided by

the present stage of modern development of the energy sector of the Ukrainian economy<sup>1</sup>.

Ukraine's energy sector faces unprecedented challenges, from a heavy reliance on expensive fossil-fuel imports to inefficient infrastructure and markets. Yet, there is also potential for Ukraine to experience an energy revolution, one that could boost employment, lift economic growth and enhance energy security. Modernisation of Ukraine's energy-supply sectors has only just begun and will require investment on a huge scale, complemented by a fundamental reform of the business environment. A strong dependency on oil and gas imports and often-inefficient energy production, transportation and supply sectors means that reducing energy demand must be a greater priority. The potential for energy efficiency gains in the residential, district heating and industrial sectors is large. Endowed with large conventional energy reserves, alongside sizeable renewable potential, Ukraine can build the capacity to significantly increase its resource production<sup>2</sup>.

The main purpose of this research: ***to show that Ukraine is searching for alternative energy sector sources and that the energy economy is open for challenges.***

The tasks of this research will be connected with:

- Identification of the Ukrainian energy sector;
- Showing the energy sector's influence on economic development;
- Solution for energy problems.

In my research I am going to use two methods of research:

- Analysis - used for collecting materials and making conclusions;
- Synthesis - used for building opinion.

<sup>1</sup> Igor G. Chervanyov, V.N. Karazin, *Step by Step Modernization of Ukrainian Energetic Sector: Reality and Tendencies*, Government Gazette, 2013 available from [w:] <http://governmentgazette.eu/?p=5610>.

<sup>2</sup> See International Energy Agency (2012), *Ukraine 2012 Energy Polices Beyond IEA Countries series*, available from: [w:] [www.iea.org/book](http://www.iea.org/book), p.2.

## Brief Overview of the Ukrainian Energy System

Coal Industry - in the energy sector of Ukraine it is the only source of own energy capable of providing thermal energy in solid fuel. However, it needs to annually produce at least 100 million tons of coal, and not 80 as produced today. I must add that today, the world stock prices for steam coal (quality comparable to that extracted in our country) is 110-120\$ per ton (spring-summer 2010 - 60-70\$), coking - 225\$ (2010 – 110\$).

Oil and Gas Industry - oil and natural gas has been used for fuel and for highly valuable raw material for the chemical industry. Oil extraction, in the structure of consumption in terms of standard fuel, accounts for 7.2% of natural gas -26.1%. Since 1970 oil and gas production has decreased. While Ukraine has been a major area of production of natural gas in the former Soviet Union and for many years Ukrainian gas was used for gasification of towns and villages. A strong pipeline was laid from Ukraine to Moscow and Leningrad. Ukrainian gas also supplied Moldova, Belarus and the Baltic republics, but Ukraine was gasified less with its own gas. Although oil and gas production in Ukraine has reduced, it has favourable factors: large capacity oil refining about 70 million tons, which are absent in Russia and large storage facilities. Gas can not be stored in the pipes and Russia has been forced to pump large amounts of it into Ukrainian storage facilities. This gas is sold to Western and Central Europe. With a reasonable foreign policy it could give Ukraine huge foreign exchange earnings.

Power Industry - in the Ukrainian economic sector, electricity plays a very important role. About half of all primary fuels (coal, oil, gas, uranium) that it has received from other states and some river energy are used to produce electricity and heat. Electricity is one of the oldest industries of Ukraine. It provides comprehensive scientific and technological progress for industries, improving working and living conditions. The developments of the electricity power industry have strengthened support for the creation of new industrial units. Some industries are geographically close to sources of cheap electricity, such as non-ferrous metallurgy and so on.

Ukraine's electricity is generated for heat (thermal), hydraulic (HPS), hydro-accumulation (PSP) and nuclear (AES) stations. In the future, it will be put into

widespread use for green energy solar and wind. Power plants in Ukraine produce 52.8 million kW. In 2004, Ukraine's power plants produced 182.2 billion kilowatt - hours of electricity. Thermal power plants accounted for about 47 % of electricity per year, nuclear power - more than 43%, hydroelectric - 9.2%. In recent years, an increased proportion of electricity has been generated by nuclear power plants.

Major thermal power plants are based in the Donbass. The most powerful are Vuglegirska (3.6 million kW), Luhansk, and Myronivska Starobyshevsk (by 2.4 million kW each). Basis Energy Dnieper makes powerful thermal power plants. Energodar is also the most powerful in AES. In addition, on the Dnieper, are several hydroelectrics with a total capacity of 2.5 million kilowatts. Powerful plants of various types were constructed near Kyiv (Trypilska GRES -1, 8 million kW and Kiev HPP and PSP). A new powerful emerging area is situated in the west and consists of thermal and nuclear power plants and includes the Power Plant in Dobrotvori and Burshtyn, and a second - Rivne and Khmelnytsky NPP. Dniester HPP also exists with a capacity of 702 MW. Southern parts of the country are least equipped with self-produced electricity. Among the great power electricity plants are the South Ukrainian nuclear power plant in the Mykolaiv region (4 million kW) and Ladyzhynska Power Plant in the Vinnytsia Oblast (1.8 million kW).

Developments in the energy complex provide the community with energy resources and this is one of the most important tasks of any country. Electricity power mostly affects development and also territorial organisation of the economy, especially industry. The fuel energy complex forms the basis of the territorial organization of the economy. Strong industrial units and centres (Kyiv) are to be found near energy power plants around which clusters and industrial districts form. The value of the energy sector in Ukraine is growing. Fixed problems with energy supply in all spheres of life have been turned into an important factor in national security. Therefore, the fuel and energy sector in the country actually represents the fundamentals of the national economy. Problems and crises within it immediately impact on all spheres of public life<sup>3</sup>.

3 П.Г. Шищенко, Я.Б. Олійник, А.В. Степаненко, П.О. Масляк. *Географія*. Навч. посіб. для старшокласників та абітурієнтів. – К.: Знання, 2001, р. 434.

## Ukraine's Energy Dilemmas

Ukraine has oil and coal reserves but it is only able to cover 47-49% of its energy demands. Russia has continued to be the biggest supplier of energy to Ukraine covering 85-90% of oil and 75-80% of natural gas imports<sup>4</sup>. Around half of Ukraine's total energy consumption comes from natural gas. Although Ukraine has larger conventional and unconventional gas resources, without deeper and comprehensive reforms and foreign investments it will be unable to increase its domestic production of gas. Similar problems can be found in the coal sector. While Ukraine has coal reserves for another 100 years, the productivity of coal extraction is very low and its production costs are high.

Without efforts at restructuring and modernisation and liberalised market reforms, Ukraine will be unable to cope with its energy supply challenges, including reducing its extremely high energy consumption<sup>5</sup>. For Ukraine's energy security, raising energy efficiency is one of the most important tasks and challenges and it needs to recognise that the cleanest and most reliable and cheapest energy is the energy it doesn't use. Energy efficiency is about delivering sustainable economic growth that minimises economic, environmental and social costs, and thereby reduces import demands and dependency on foreign suppliers. The lack of strong reforms is linked to widespread corruption and politically connected business groups who have taken control of controlling stakes in state – owned enterprises through non – transparent insider privatisation deals and other opaque economic activities. These groups and their vested short – term interests are not interested in market reforms and transparent privatisation. As a critical Ukrainian study concluded: *the key players in energy security in Ukraine are those who form or influence the formation of energy policy and who include the government, international partners, business and consumers. None of these players defends the country's national interests nor have any of them guaranteed its energy security*<sup>6</sup>.

4 I. Patronym, I. Zhovkva, *Energy Security Challenges in Ukraine: A Snapshot -2010*, Policy Paper, Kiev: International Center for Policy Studies 2010, p. 21.

5 T. Kistnyuk, *Energy Efficient Ukraine: Is There a Light at the End of the Tunnel?* Ukrainian Energy, 2011, p. 12.

6 Patronym, Zhovkva, op.cit., p. 7.

As a result, Ukraine will also face an increasing environmental challenge as the share of coal in energy consumption is planned to grow from 22% in its energy mix 2005 to 33% in 2030, which may double Greenhouse Gas Emissions (GHGE) according to its 2006 Energy Strategy<sup>7</sup>. In this regard, independent energy experts and NGOs in Ukraine have expressed their concerns about the closed and non-transparent update of Ukraine's Energy Strategy until 2030 and are appealing for a public discussion of proposals and the inclusion of independent experts. The mechanism for adopting appropriate legislation and signing international agreements in the energy sector is ineffective and another factor that has contributed to an inadequate investment climate and the absence of structural reforms in the energy sector. One reason for the failure to attract investments is Ukraine's power grid system; this is essential for both raising energy efficiency and conservation as well as modernising Ukraine's energy sector, industry and households as well as diversifying its national energy mix by expanding renewable energy sources.

The only sector that has received substantial investments is the nuclear power industry which currently is opening 15 nuclear power blocks in the country. Ukraine is the seventh largest nuclear power producer in the world and the fourth largest in Europe. But its electricity grid is also ageing rapidly and, at present, electricity is being exported only to Poland, Hungary, Romania, and Slovakia. To increase its electricity exports from 11.35 billion (bn) kWh in 2010 to 25 bn kWh by 2030 and integrate power grids with European UCTE standards can only be realistic through massive modernisation and investments. In 2010, Ukraine signed agreements with Russia to build two nuclear reactors giving Russia a monopoly on the supply of fuel to Ukrainian reactors until they cease operation and plants producing nuclear fuel will be constructed on the basis of Russian technology. Taking this path, the Ukrainian government gave up the option of receiving alternative deliveries of American or other foreign fuels and technologies and ignored its own energy strategy that calls for the diversification of deliveries of nuclear fuel as well as technologies. The result is Russia's complete domination of Ukraine's nuclear energy sector as the energy agreements will not only make Ukraine more

7 See Patronymk and Zhovkva, *op. cit.*, p.24.



dependent on Russia but also threaten its declared and urgent reform policies in the energy sector<sup>8</sup>.

## Energy Security

Ukrainian energy security means the ability of the state to ensure an efficient to use fuel and power base, make optimal diversification of sources and routes of energy supply in Ukraine for the livelihood and normal functioning of the national economy, emergency and martial law, to prevent sharp price fluctuations in fuel energy resources and to create the conditions for seamless adaptation of the national economy to the new prices for these resources. For Ukraine, the issue of energy security is now the main condition of its existence as an independent state. Measures of state regulation to ensure energy security can be divided into preventive and disposal. Preventive measures and their implementation should make Ukraine less vulnerable to energy shocks from the economy and most important of all: energy efficiency, diversification of sources of energy, stimulating the production of basic fuels and electricity, and the use of alternative and renewable energy.

These activities will include, in particular, the creation of Ukraine's strategic gas and oil reserves being controlled by state authorities, and the distribution of oil and gas in the event of serious breaches of customer supply infrastructure. Also, it must explore and drill oil fields for strategic purposes, which can be introduced into service in case of war.

Achieving energy security will not be possible without identifying the factors which may have a negative impact on the development of the energy sector. One of the main goals of the State Energy Policy which can be found embodied in the National Energy Programme of Ukraine for 2010, is to meet Ukraine's fuel and

<sup>8</sup> T. Kuzio, D. Hamilton, *Open Ukraine changing Course towards a European future*, Washington 2011, p.100.

energy resources by increasing the share of domestic production and a reduction of foreign energy dependence by reducing the volume of imports<sup>9</sup>.

Currently, attention is being paid to the financing of exploration, which is essential to ensure an increase in Ukraine's own oil and gas. It should be noted that the amount of deep exploratory drilling for oil and gas in recent years has declined 5 times since 1990 and hydrocarbon raw material has increased 3 times. Experience shows that to ensure stable oil and gas, reserves need to be increased at least two times higher than annual production. Insufficient exploration work could lead to a decrease in oil and gas in the future. It has even been proven that reserves of energy make it possible to increase this production at least twice, which would allow savings of more than two billion dollars annually. The accelerated development of the Ukrainian coal industry has been a guarantor of its energy and economic independence and that requires financial support from the state. Some allegations have been made about the inappropriate development of the coal industry because of the low quality character of domestic coal and because great material and financial costs are not sufficiently justified in the context of national security. Given the significant reserves of coal in Ukraine, they can contribute to raising the level of ensuring its energy security. Implementation of measures for energy increasing the volume of gas production, using alternative energy sources provide by the National Energy Programme, will help reduce the consumption of natural gas in the economy by 2010 by 32.3% compared to 1990 and reduce its imports by 49%.

Measures should be taken to diversify the sources of Ukraine's energy; in particular to complete the construction of an oil terminal near Odessa, to expand economic ties with Turkmenistan and Middle Eastern countries, with Turkey for oil and gas, and to develop domestic sources of energy, including the coal industry and the oil and gas industries. Creating a diversified model of oil security in Ukraine will not only help to join the economy to alternative sources of supply, but will also play a part in it recognising its national interests and its role as a transit corridor for existing and prospective energy supply. Otherwise, its transit role can be intercepted by other countries. Furthermore, with the improvement of

<sup>9</sup> *Національна енергетична програма України* : Схвалена постановою Верховної Ради України № 191, від 15 травня 1996 року.- К., 1996. - 120 с. – Машинопис.

oil processing in refineries, Ukraine should increase production in new fields. However, it cannot be doubted that despite proven reserves of oil, geologists produce only about 10%, while foreign oil companies extract 50% or more. Ukraine has great potential for natural gas transit. However, over 35% of operating gas pipelines are over 20 years old. Each year it must perform an overhaul of 250-300 km of gas pipelines. The poor technical condition of pipelines allows transport to European countries of not more than 100 billion cubic meters out of a capacity of more than 120 billion cubic meters of gas, currently without substantial economic risks. This may undermine Ukraine's geo-strategic position as a major transit link pipeline system "East-West".

It is important to improve the reliability of the fuel for electricity, reduce dependence on import fuel oil, natural gas and coal, which need to be replaced in the future. By the way, electricity generation uses a range of advanced technologies in developed countries. This is done for two reasons:

- 1) to equal certain economic technologies;
- 2) the need to diversify the types and sources of fuel for reliability of thermal and energy independence.

This approach would be applied in other countries. To improve the reliability and safety of nuclear power plants it is necessary to conduct reconstruction and modernisation of existing VVER units and improve scientific and technical support for the nuclear power complex.

Decommissioning Chernobyl should be linked to the financing of the programme by Western countries and international financial organisations. Otherwise, the problem lays a huge burden on the budget and will have a negative impact on the implementation of the energy security reform. Particularly important to note is that the Ukrainian energy security establishment needs to own its nuclear fuel cycle. This would guarantee the independence of providing nuclear fuel and saving foreign currency.

Russia provides a policy of parallel strategies, one of which is to accelerate the development of oil and gas infrastructure and second - to establish control over oil and gas infrastructure in the former Soviet Republics. In particular, the second strategy focuses on acquisition of ownership rights in important oil and

gas facilities in the privatisation process or to receive them as compensation for public debt resulting from import of Russian energy.

Energy conservation is the most promising direction that provides Ukraine with energy. Only through low-cost measures can Ukraine save at least 10% of energy.

Priority measures that will ensure energy conservation include:

- development of comprehensive efficiency state energy programmes;
- technical re-equipment of production;
- establishment of extra-budgetary energy efficiency fund;
- strict accounting and control over energy consumption in all sectors of production;
- stimulation of energy efficiency technologies;
- implementation of the restructuring of the economy by decreasing the energy-intensive industries;
- use of alternative and renewable energy sources.

Without changing the structure of domestic production with energy-saving technologies, Ukraine will continue to depend on import of oil and gas and lose heavily. It is an important public task to improve the management of the fuel and energy complex and energy-saving process<sup>10</sup>.

## Solutions to Energy's Problems

One solution would be to pin legislative parity changes in the price for the transit of oil and gas, oil obtained in Ukraine's gas transportation system and the prices received for oil and gas from the country. Ukraine should withdraw from the price set forth in the intergovernmental agreement with Russia, which was valid until 2013. Price transit must be tied to the price of oil and gas on world markets. Price transit can be not less than the price for oil and gas transit through Ukraine to other relevant countries or entities controlled by oil pipeline system countries. It should be understood that the price of energy in Europe is made up not only of

<sup>10</sup> В.Т.Шлемко, І.Ф.Бінько, *Економічна безпека України: сутність і напрямки забезпечення*, Монографія. – К. : НІСД, 1997. – р.144.

Russian or Turkmen gas and oil but also for transit. Thus, it should have the right to increase the price according to the market conjuncture derivable from not only energy, but also its transportation.

Legislation is needed to prohibit contracts for oil and gas supplies of Ukraine's structures that do not have appropriate gas and oil deposits, the deposits of which are able to cover the supply; to prohibit by law the implementation of oil and gas in Ukraine across borders or those that are created with the participation of other countries, unless such sale is made through the relevant commodity exchanges; to prohibit legislation on the alienation of state oil and gas transportation systems and their parts, making them collateral or to share the statutory fund or any structures.

An inventory of the energy system in all sectors of energy consumption and energy generation should be taken and roundtables organized to discuss the topic. A contest should be held for the most effective investing in energy efficient technologies or alternative energy. According to the results of the competition government programmes could be devised.

A national programme of measures is needed to implement energy-saving technologies for the elimination and prevention of loss of wider implementation of advanced technologies in the field of wind energy and solar energy, to create electric vehicles, electric blocks at gas stations, switching to electric heating in independent apartments and houses to use of methane gas from coal seams, gas and more compost. This development must attract scientists and investors.

Business entities should be obliged to engage in the energy sector and energy losses and those who invest in the implementation of these programmes given tax relief. In case of excess amounts of tax payments, free credit from NBU could be provided. NBU reserves have to work on the economy of Ukraine. Tender loans could be provided for energy saving programmes from foreign banks. Experience shows that it is possible to obtain loans at 2-3% per annum<sup>11</sup>.

**11** M. Voronin, *Ways of solving energy problems*, [w:] [http://www.experts.in.ua/baza/analitic/index.php?ELEMENT\\_ID=11010](http://www.experts.in.ua/baza/analitic/index.php?ELEMENT_ID=11010).

## Conclusion

Energy security is one of the most important components of the national security. Its level is determined by the fuel and energy complex's ability to provide the country with energy resources in stable, emergency and even extraordinary conditions. Basic indicators that determine the state of, and trends in, Ukraine's fuel and energy sector have been analysed. Now is the time to clean up Ukraine's corruption. Ukraine has been hooked on cheap Russian gas for too long, says CSIS's Chow. Thais has stifled incentives to modernise the economy and look for energy alternatives, all the while lining the pockets of the rich and powerful to the tune of billions of dollars every year. Chow says graft is endemic in Ukraine's oil and gas industry. Transparency International ranks Ukraine 144 out of 177 countries for perceptions of corruption.

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