



# CREATION OF OIL RESERVES IN UKRAINE

ISSUES AND OUTLOOK

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With regard to provision of petroleum products, Ukraine is extremely dependent on external supplies. In 2016, the share of domestic production compared to imports was approximately 35:65 for automotive gasoline, and 12:88 for diesel fuel. At the same time, the share of petroleum products produced in the Russian Federation or manufactured using Russian feedstock in the imports structure exceeded 80 %. Imports directly from the RF totaled 23 % of diesel fuel, and 2 % of automotive gasoline. Further 63 % of the former and 91 % of the latter type of resources were imported from Belarus, and through its territory - from Lithuania. Therefore, by using the instruments of political pressure on the Republic of Belarus (directly or indirectly through Russian shareholders of Mozyr Oil Refinery), the RF is able to block two thirds of supplies of automotive gasoline and diesel fuel needed by the Ukrainian economy. At the same time, the market participants are unable to promptly increase the supply volumes because of the working capital shortage and excessive lending rates, which resulted in a decrease of the current reserves of retailers from 17...30 to 7...10 days of consumption.

The blockade of supply of petroleum products from the Russian Federation will lead to their deficit in Ukraine totaling 5 million tons per year, which can be compensated at the expense of the available reserves of the state, operators, and consumers only by a quarter while the current stock of fuel in the domestic market will suffice for 7...10 days. Since petroleum products are infrastructure goods, their shortage will result in the cumulative growth of prices for goods and services, decrease of the already low paying capacity, and increase of social discontent - primarily in the eastern and southern regions of Ukraine.

In view of this, there is a need to implement the EU Council Directive 2009/119/EC, according to which the Member States' commitment to maintain the minimum reserves of crude oil and/or petroleum products is seen as one of the urgent tasks in the national security sphere.



## UKRAINE'S COMMITMENTS

The need to implement the requirements of Directive 2009/119/EC in Ukraine has been provided for by the Decision of the 10th Ministerial Council of the Energy Community dated October 18, 2012<sup>1</sup>. The decision expands the sphere of application of the Treaty Establishing the Energy Community, which Ukraine joined on February 1, 2011<sup>2</sup>.

A detailed plan of implementation of Directive 2009/119/EC in Ukraine was adopted on April 8, 2015<sup>3</sup> in order “to enhance the level of the state’s energy security by establishing an efficient system of protection of the Ukrainian economy from sudden accidental and long-lasting termination of supply of oil and petroleum products caused by man-made, natural, military, political, and other crises in the oil-supplying countries”<sup>4</sup>.

The main tasks of the Plan were identified as:

- development of legal, organizational, financial and economic principles for the establishment and functioning in Ukraine of a system of the minimum reserves of oil and petroleum products;
- regulation of relations in the sphere of minimum reserves management.

At the same time, it was stated that the system of the minimum reserves of oil and petroleum products in Ukraine should be based on a stage-by-stage development taking into account the principles of the EU legislation “of an extensive and modern network for efficient storage of oil, connected to refineries, export and import terminals as well as other infrastructure” that will exist “within the system of the main oil pipelines”<sup>5</sup>.

The Ministry of Energy and Coal Industry was identified as the agency responsible for organization of work and implementation of

1 <http://www.energy-community.org/pls/portal/docs/1766216.PDF>

2 [http://zakon3.rada.gov.ua/laws/show/994\\_a27](http://zakon3.rada.gov.ua/laws/show/994_a27)

3 <http://zakon2.rada.gov.ua/laws/show/346-2015-p>

4 [http://www.kmu.gov.ua/document/248091904/Dir\\_2009\\_119.pdf](http://www.kmu.gov.ua/document/248091904/Dir_2009_119.pdf)

5 Ibid.

the Plan activities, which has to:

- in March 2015 – create a working group on implementation of the requirements of Directive 2009/119/EC (Task 1.2.3);
- by August 2015 – ensure such detailed breakdown of data on oil and petroleum products that makes it possible to collect them on a monthly and an annual basis as provided for in Articles 4 (a) and (b) of the Rules (EC) No. 1099/2008 (Task 1.2.1), starting August 2015 (monthly) and starting 2015 (annually) – officially submit them to the Energy Community Secretariat (Task 1.2.2);
- with the involvement of members of the working group, develop and submit to the Cabinet of Ministers pursuant to the established procedure:
  - in December 2015 – a reconciled with the Energy Community Secretariat draft normative legal act on the model of the minimum reserves of oil and/or petroleum products selected by Ukraine that contains a plan of the gradual growth of reserves, the program of financing, information about the responsible agency as well as the “steps for approximation of legislation” (Task 1.1.1);
  - in December 2016 – a draft law on maintaining the minimum reserves of oil and/or petroleum products (Task 1.1.2);
- by April 2017 – approve the design documents for the construction of the required number of reservoirs for storing the entire volume of minimum reserves of oil and petroleum products (Task 1.2.4);
- in January 2017 – December 2022 – ensure completion of the minimum reserves of oil and petroleum products and respective reporting pursuant to the established procedure (Task 1.2.5).

The Ministry of Energy and Coal Industry has to draft normative and legal acts jointly with the Ministry of Economic Development and the Ministry of Justice.

## THE STATUS OF IMPLEMENTATION OF COMMITMENTS

INSUFFICIENT PERFORMANCE, ABSENCE OF DEMANDS, LOW EXECUTIVE DISCIPLINE, AND REORGANIZATION OF A NUMBER OF RESPONSIBLE INSTITUTIONS RESULTED IN A FAILURE TO TIMELY IMPLEMENT THE MAJORITY OF TASKS RELATED TO THE IMPLEMENTATION OF DIRECTIVE 2009/119/EC DESPITE THE CLEAR GOALS, DEVELOPED PLANS, AVAILABLE SUPPORT FROM THE PARTNERS AND ESTABLISHMENT OF SEVERAL WORKING GROUPS.

According to Clause 1.1.2 of the Directive 2009/119/EC implementation plan, the Ministry of Energy and Coal Industry had to draft a law of Ukraine on maintenance of the minimum stocks of oil and petroleum products<sup>6</sup> and the Verkhovna Rada of Ukraine to adopt the act as a whole in December 2016.

Instead, according to the draft CMU order “On Amendments to Cabinet of Ministers Order No. 847 dated September 17, 2014” prepared by the State Reserve Agency in pursuance of CMU Order No. 22373/1/1-16 dated June 17, 2016, the authority to develop the relevant draft law are planned to be shifted to the State Reserve Agency of Ukraine. But according to its regulation<sup>7</sup>, the said state body is only authorized to implement the public policy concerning the state material reserve. Therefore, making it responsible for policy-making in this field violates Clause 2, Article 1 of the Law “On Central Bodies of Executive Power”<sup>8</sup>.

Independent experts consider as dangerous the attempts by the management of the State Reserve Agency to turn this state body into the “key initiator”<sup>9</sup> and single implementer of the Directive 2009/119/EC implementation plan, especially in view of the fact that the draft law “On Strategic Reserve” prepared and presented on March 15, 2016 by the State Reserve Agency of Ukraine contains “a great number of conceptual errors”<sup>10</sup>.

6 [http://www.kmu.gov.ua/document/248091904/Dir\\_2009\\_119.pdf](http://www.kmu.gov.ua/document/248091904/Dir_2009_119.pdf)

7 <http://zakon2.rada.gov.ua/laws/show/517-2014-p>

8 <http://zakon5.rada.gov.ua/laws/show/3166-17>

9 [http://www.kmu.gov.ua/control/uk/publish/article?art\\_id=248887547&cat\\_id=247229077](http://www.kmu.gov.ua/control/uk/publish/article?art_id=248887547&cat_id=247229077)

10 <http://agroportal.ua/publishing/lichnyi-vzglyad/mnimaya-borba-s-korruptsiei-otsutstvie-reform-pri-pustykh-skladakh-gosrezerva/>

According to Clause 1.1.1 of the Directive 2009/119/EC implementation plan, the Ministry of Energy and Coal Industry in cooperation with the Energy Community Secretariat had to develop and the Cabinet of Ministers to adopt in December 2015 a legal act on Ukraine’s preferred model of oil and petroleum products stocks<sup>11</sup>.

By its Order No. 412, dated July 2, 2015, the Ministry of Energy and Coal Industry created a working group to create oil and petroleum products stocks. Its meetings, which took place with the participation of experts from the Energy Community and the International Energy Agency, determined that the minimum stocks of oil and petroleum products in Ukraine must total 1.97 million tons in oil equivalent, in particular, 580,000 tons of crude oil, 460,000 tons of diesel fuel, and 930,000 tons of gasoline. A funding source for the work to create such stocks may be an additional charge imposed on petroleum products market participants in the amount of UAH 0.40 per liter of gasoline and diesel fuel sold in 2017-2023<sup>12</sup>.

The proposal stirred an agitated discussion in the Ukrainian media. In particular, a concern was raised that the stock formation model would ignore the interests of the majority of market participants. It was pointed out that the responsibility for creating an effective stock formation mechanism must be primarily on the government rather than taxpayers<sup>13</sup>.

With this in mind, European experts proposed a mixed stock management system based on cooperation between the government and

11 [http://www.kmu.gov.ua/document/248091904/Dir\\_2009\\_119.pdf](http://www.kmu.gov.ua/document/248091904/Dir_2009_119.pdf)

12 <http://interfax.com.ua/news/economic/346294.html>

13 <http://www.unn.com.ua/uk/news/1578792-vid-efektivnosti-modeli-formuvannya-naftorezervu-zalezhatimut-i-tsini-na-palne-ekspert>

market participants and regulated by an independent entity, an agency. This agency may have the authority to acquire and sell oil and petroleum products, conclude storage agreements with market participants and the State Reserve Agency, and sign option contracts for the supply of such products<sup>14</sup>.

Contrary to these recommendations, the State Reserve Agency developed and agreed with the Ministry of Economic Development and Trade and the Ministry of Energy and Coal Industry a draft CMU Order “On Approving the Implementation Plan Developed by the State Reserve Agency of Ukraine for Council Directive 2009/119/EC dated September 14, 2009 Binding the Member States to Maintain the Minimum Security Stocks of Crude Oil and Petroleum Products.”

According to the latest version of this document<sup>15</sup>, the Cabinet of Ministers will be asked to identify the State Reserve responsible for “organizing work and implementing measures for the implementation of the Directive 2009/119/EC” instead of the Ministry of Energy and Coal and postpone the deadlines:

- Adoption of a normative legal act of the Cabinet of Ministers on the model of minimum oil and petroleum products reserves – from December 2015 to December 2017;
- Adoption of the Law “On Minimum Oil and Petroleum Products Reserve” – from December 2016 to December 2017;
- Implementation of all planned organizational measures - for the period after the entry into force of the law “On Minimum Oil and Petroleum Products Reserve”.

At the same time, by July 1, 2017, it is proposed to create a new interdepartmental working group under the State Reserve for the development of regulatory acts envisaged by the implementation plan, instead of the already established Order of the Ministry of Energy and Coal Industry No. 412 dated July 2, 2015.

Although the new implementation plan of Directive 2009/119/EC has not yet been approved, the official website of the State

14 <http://interfax.com.ua/news/economic/346294.html>

15 <http://civic.kmu.gov.ua/consult MVC kmu/uploads/attach-3346-490347147.pdf>

Reserve already states that the agency is “the main executor of the implementation of the reform of the formation of strategic stocks of oil and petroleum products”<sup>16</sup>. The base for their formation should be the company under the conditional name *Naftorezerv*.

This industry holding is proposed to be created “in accordance with the best European practices”<sup>17</sup>, combining six integrated storage bases in state system of storage of petrol, diesel and aircraft fuel *Astra* (Chernihiv region), *Rekord* (Zhytomyr region), *Estafeta* (Khmelnitsky region), *Planeta* (Kharkiv region), *Zirka* and *Berdiansk* (Zaporizhzhia region) – the total amount of storage is “up to 1 million tons”<sup>18</sup>. After the founding of company “it should be corporatized, transformed into a public joint stock company and then it partially sold, reserving the controlling stake for the state”. The capacities of the consolidated company will be able to provide storage of about a half the volume of reserves established by requirements of the Directive 119/EC (1 million tons of oil equivalent). The rest “should be placed in the market”<sup>19</sup>.

Since all six storage bases that are planned to operate in order to comply with the requirements of Directive 2009/119/EC are intended for storage of gasoline, diesel and aviation fuel, it is possible that we are dealing with another confusion since as a result of the unsettled Ukrainian terminology, domestic politicians and government employees do not always distinguish the concept of state reserve and minimum stocks of oil and/or oil products, stabilization stock and mobilization reserve, which leads to errors in the making policy in this area.

Thus, Ukraine has not yet approached the creation of the regulatory framework necessary for the creation of oil reserves, although the relevant work was begun before the accession of Ukraine to the Energy Community, and the work has not gone away.

16 <http://rezerv.gov.ua/>

17 [http://www.gosrezerv.gov.ua/reserv/control/uk/publish/article?art\\_id=169389&cat\\_id=45334](http://www.gosrezerv.gov.ua/reserv/control/uk/publish/article?art_id=169389&cat_id=45334)

18 [http://www.gosrezerv.gov.ua/reserv/control/uk/publish/article?art\\_id=169769&cat\\_id=45334](http://www.gosrezerv.gov.ua/reserv/control/uk/publish/article?art_id=169769&cat_id=45334)

19 [http://www.gosrezerv.gov.ua/reserv/control/uk/publish/article?art\\_id=169841&cat\\_id=45334](http://www.gosrezerv.gov.ua/reserv/control/uk/publish/article?art_id=169841&cat_id=45334)

The lack of progress in the implementation of the requirements of Directive 2009/119/EC is confirmed by the report of the Secretariat of the European Energy Community<sup>20</sup>. It states that “none of the priority tasks of the past year has been fulfilled, being postponed

20 [https://www.energy-community.org/portal/page/portal/ENC\\_HOME/DOCS/4332394/3D790302C9FD5024E053C92FA8COD492.pdf](https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/4332394/3D790302C9FD5024E053C92FA8COD492.pdf)

indefinitely”. Given this, Ukraine’s priority should be to determine the model and approve the action plan for the creation of minimum oil and petroleum products stocks, as well as the adoption of normative acts necessary for their formation and the development of a management system for them.

## FURTHER IMPLEMENTATION RISKS

THERE WERE SEVERAL ATTEMPTS TO INITIATE CREATION OF OIL RESERVES IN UKRAINE. HOWEVER, THE RESPECTIVE NORMATIVE DOCUMENTS ESTABLISHED UNREALISTIC TIME LINES FOR THEIR CREATION, AND DID NOT PROVIDE FOR ALLOCATION OF ANY FUNDS. FOR INSTANCE, IN JANUARY 2006, THE GOVERNMENT OBLIGATED THE STATE RESERVE AGENCY OF UKRAINE BY NOVEMBER 1 TO CREATE THE RESERVE OF GASOLINE AND DIESEL FUEL TOTALING 10 % OF THEIR CONSUMPTION, YET IT FAILED TO PROVIDE 2.5 BILLION HRYVNIA TO BUY THEM, WHICH WAS NOT PROVIDED FOR IN THE BUDGET.

Funds were also not provided for creation in November 2006 of a stabilization reserve of petroleum products<sup>21</sup>. It was planned that the purchased feedstock would be stored in the reservoirs of OJSC *Ukrtransnafta* and processed by Kremenchuk Oil Refinery. It was planned that the received 80...110 thousand tons of gasoline and 100...130 thousand tons of diesel fuel would be sold to agrarians and other consumers with the minimal possible retail margin and only during the seasonal growth of prices. Having failed to receive the loan necessary to buy oil, the Ministry of Fuel and Energy tried to involve CJSC *UkrGasEnergo* in the process of creating the reserves. However, the inefficient decisions made by this company resulted in supplying petroleum products for Kremenchuk Oil Refinery at a cost that was much higher than the market price. The hopes to store the fuel in the reservoirs of the Affiliate Company *Ukrtransnaftoproduct* were not fulfilled either. This company turned out to be unable to receive the necessary volumes of gasoline and diesel fuel. Due to this, petroleum products produced using the feedstock bought at the peak of its price were stored in the reservoirs of Lysychansk OPP on commercial terms<sup>22</sup>.

21 Not Much Good// Terminal. 2006. № 48. p. 22-24.

22 Ibid.

The issue of efficiency of purchase and calculation of the risks related to provision of loans on oil reserves as well as significant variability of oil prices was also not addressed in April 2011 when NJSC *Naftogaz of Ukraine* bought the next consignment of feedstock for the “stabilization reserve”. Thirteen unsuccessful auctions, during which the company tried to sell the fuel produced using the feedstock from this consignment at a price that was 5...11 % higher than its market value actually proved that “creation of the stabilization reserve” was understood by the executive bodies as a means of compensation at the state expense of the losses resulting from inefficient management of individual companies.

The attempt of PJSC *Ukrtransnafta* to create in 2014 the “strategic reserve” on the basis of 675,000 tons of technological oil withdrawn from the main pipelines in March-May 2014 looked no less suspicious. The necessity of this step was explained by the risk of separatists seizing the feedstock although the volume of this resource within the zone of the anti-terrorist operation totaled only 200,000 tons<sup>23</sup>.

23 <http://nashigroshi.org/2014/04/11/ukrtransnafta-ocholyuvana-menedzherom-pryvatu-hoche-daty-pryvatu-milyardnyi-zarobitok-na-zlyvnafty>



According to the information available to the author, PJSC *Ukrtransnafta* was planning to process nearly 400,000 tons of feedstock at Kremenchuk OPP, and to place another 275,000 tons for storage in the reservoirs of the companies controlled by the *Privat Group*. However, the price quoted for oil processing in Kremenchuk Oil Refinery was 1,080 UAH/t (in 2011-2012, Lysychansk Oil Refinery processed oil for 288 UAH/t, and Kremenchuk Oil Refinery – for 670 UAH/t), whereas the technological losses of the plant were estimated to be 11.8 %, which is almost double of the average level. Taking that into consideration, exports of feedstock and purchase of the respective volumes of petroleum products abroad would have allowed PJSC *Ukrtransnafta* to save approximately \$33 million. Another question remaining unanswered was the price of oil to be transferred to Kremenchuk Oil Refinery since the difference between its book and market value totals almost \$280 million.

At the same time, the works on oil displacement were carried out without design documentations and environmental expert analysis, without confirmation of ownership of the displaced oil, and without coordination with the Cabinet of Ministers and the Ministry of Energy and Coal Industry.

In view of this, and taking into consideration the 2009 precedent, when Kremenchuk Oil Refinery processed the technological feedstock of OJSC *Ukrtransnafta* kept by the company in consignment storage, the Office of the Prosecutor General started a probe into the legality of the technological feedstock displacement by an operator of the oil transportation system of Ukraine<sup>24</sup>.

There are no doubts that similar problems could also emerge in the process of creation of the oil reserves in accordance with the requirements of Directive 2009/119/EC.

Unfortunately, the rhetoric of its implementation in Ukraine is also used for justifying or hiding violations of the law. Furthermore, the following questions still remain unanswered:

1. What are the “state”, “emergency”, “strategic”, “stabilization”, “crisis” reserves? What is the difference between them? What exactly should be stored

24 <http://toplivo.rbc.ua/ukr/genprokuratura-proveryaetzakonnost-otkachivaniya-bolee-02082014152600>

and where? What is the purpose of the created reserves? Who will determine the efficiency of its creation and use and according to which criteria?

2. Under what conditions will the reserve are used? What are the risks related to storage, transportation, and use of the reserves under all possible scenarios? What is the difference in the need for oil and petroleum products in the event of occurrence of each scenario? What is the meaning of the phrase “inability of the ordinary channels to provide consumers with petroleum products”? Who will determine this and on what grounds?
3. Which companies will process crude oil and place it for storage? What is the procedure for its transportation, and how to assess the related risks? On what terms should oil be processed? Can the OPP owner impose conditions of cooperation that are unprofitable for the state in the event of emergence of a crisis situation? How will the needs of the national economy be met during the period necessary for oil processing?
4. What will be the responsibility of the owners of petroleum depots for violation of storage agreements? What should be done in the case of bankruptcy of companies that stored the reserve oil and petroleum products?
5. What should be the procedure for reserves renewal? What will be the impact of availability of large volumes of petroleum products for free trade during the period of reserve renewal? What should their price be? What should be the procedure for their sale? Will the market participants be notified about the plans of procurement of new and sale of the renewed volumes of petroleum products? Will the replacement of reserves be reflected in the estimated balance sheet of the Ministry of Energy and Coal Industry?

Having received answers to the above questions, the public authorities responsible for implementing Directive 2009/119/EC will be able to approach the work more systematically. This will also be facilitated by the approval of the Energy Strategy of Ukraine until 2035, in which Ukraine’s commitments to create energy reserve has been confirmed.

## PROSPECTS FOR ESTABLISHING AN ENERGY RESERVE

IT WOULD BE WRONG TO BELIEVE THAT THE ISSUE OF RELIABLE ENERGY SUPPLY IS REDUCED ONLY TO SOLVING THE PROBLEM OF BEING DEPENDENT ON IMPORTS AND INCREASING THE DOMESTIC EXTRACTION VOLUMES. INCREASING THE RELIABILITY INVOLVES DEVELOPMENT AND IMPLEMENTATION OF A VAST RANGE OF INITIATIVES AIMED AT DIVERSIFYING GENERATION AND WIDER USE OF TECHNOLOGIES THAT ENSURE THE HIGHEST COEFFICIENTS OF ENERGY TRANSFORMATION.

At the same time, it is Ukraine, which has the experience of hybrid war with the RF when the reserves in the Autonomous Republic of Crime, Donetsk and Luhansk were seized by the enemy, should present new initiatives in the sphere of guaranteeing collective energy security of Europe.

The respective vision should be based on the following theses:

- every consumer should have a possibility to use different sources of energy at different time;
- the energy consumption structure should be determined taking into consideration economic and environmental feasibility;
- fuel and energy production should be decentralized, and energy flows should be disaggregated;
- in every region, its own energy reserve should be created taking into account the energy consumption structure and various time of seasonal load, provided the state preserves its function to manage these reserves during the special period.

Such approach radically differs from the accepted EU policy on creating oil reserves. The problem is that the requirements concerning the 90-day reserve were formulated in the early 2000s when the oil prices were relatively low. At that time, the issues related to increasing energy efficiency and energy conservation were not yet so pressing. The transfer to renewable sources was not discussed, and climate change was debated upon exclusively by the academic community. However, after the increase of the oil prices and the EU accession of twelve new member states with limited financial possibilities for creating their own resources, the Union’s plans began to cause doubts.

In view of this, the new EU member states had to demand answers to the following questions:

- Why should the oil reserves be created and stored by every country, and not only by those countries that have such possibilities?
- Why should the volume of oil reserves of the EU member states suffice to cover precisely 90-day replacement of imports?
- Why is the volume of oil reserves estimated on the basis of consumption in an “ordinary” situation not taking into consideration the “emergency” (frenzy), seasonal and other factors?
- Why are the consumption volumes measured using tons, and not using the energy characteristics of the resource taking into consideration the predictable nature of its use and the role in guaranteeing energy security?
- What should be the threshold volumes of concentration of the reserve resources, and does such concentration increase environmental and other risks related to emergency situations?
- Why is mutual replaceability of energy resources not taken into consideration?
- Is it possible to create the strategic reserve by reserving the facilities for production of necessary energy commodities and feedstock?
- Is it possible instead of the oil reserve to create a reserve system that would combine the reserves of various types of fuel and ensure sustainable functioning of all branches of economy, and not only its transport component?

In the event of a positive answer to the last question, it will be possible to develop the requirements for the system of collective energy security based on creation of the reserves of facilities in the sphere of oil processing, coal, oil and gas industry, nuclear, renewable energy and electricity taking into consideration the possibility of a rapid change of the structure of consumed energy resources. In this process, in order to decrease the impact of the price component on the functioning of this system, a mechanism of financial risks hedging should be developed at the European, national and regional levels.

Such approach will make it possible to mitigate the outcomes of the growth of prices for energy resources and the increased

## EARMARKED STATUS OF RESERVES UNTIL 2035

THE RESERVES OF OIL AND PETROLEUM PRODUCTS HAVE TO BE CREATED FOR THE 90-DAY PERIOD OF CONSUMPTION IN NORMAL DEMAND CONDITIONS. SINCE THIS IS A TIME-CONSUMING AND COSTLY PROCESS, IT IS RECOMMENDED THAT THE RESERVES SHOULD BE CREATED ON A STAGE-BY-STAGE BASIS, SIMULTANEOUSLY WITH THE DEVELOPMENT OF THE RESPECTIVE FINANCING MECHANISMS..

Since the structure of oil reserves should provide for the possibility of prompt response to a rapidly changing situation, it is not feasible to create the reserve of domestically produced feedstock (in the volume totaling 25 % of its annual consumption) during the first stage of creation of the minimum reserves.

The priority task should be to create the motor fuel reserve in the volume totaling 20-day period of consumption in normal demand conditions (550,000 tons).

The structure of such reserve should correspond to the structure of sales of light petroleum products for cash (65 % gasoline and 35 % diesel fuel), namely 350,000 tons of A-95-Euro5 gasoline and 200,000 tons of diesel fuel (in April-October – Type A; in November-March – Type E). Selection of the type of gasoline is based on the largest volumes of its consumption in Ukraine and the decisive influence on domestic price-setting processes.

For the period ending 2025, further increase

volumes of their consumption. However, its implementation is impossible without decentralization of production of fuel and energy, development of multi-vector, multi-polar, multicellular energy industry, which takes into consideration the priority areas of national and regional energy supply and energy conservation. At the same time, the transition to a new stage of development of the fuel and energy complex should imply not so much the extensive use of new sources of energy but rather the use of technologies with higher transformation coefficients. Also, one should not forget that all new energy projects require vast provision of information to the public about their advantages, which usually guarantees their successful implementation.

of the volumes of reserves should be envisaged for each economic agent working in this market – up to 10 % of the annual sales volume (in total, for 2017-2025 – 1.2 million tons of automotive gasoline, and 1.5 million tons of diesel fuel).

Starting 2021, simultaneously with the creation of the reserves of oil and petroleum products, there should be a transfer to creation of flexible strategic energy reserves since the availability of oil reserves only, as they are currently understood, will result in creation of an inefficient structure from the energy security point of view.

In addition:

- the structure of energy reserves in Ukraine should comply with the structure of energy consumption, combine the reserves of various types of fuel and energy, and ensure sustainable functioning of all branches of economy, and not only transport (such as oil and petroleum products);
- every consumer should have a possibility

to use various sources at various time, while the structure of energy consumption at a local level should be determined taking into consideration economic and environmental feasibility;

- production of fuel and energy should be decentralized;
- reserves of fuel and energy should be created in every region, provided the state preserves its function to manage these reserves during the special period, and energy consumption structure as well as various time of seasonal load is taken into account;
- energy flows should be disaggregated.

The optimization objective can be formulated as follows:

- restriction – the identified level of energy security that takes into consideration the structure of regional energy supply and energy consumption; time lines for the country's achieving the identified security level;
- the target function – the cost of the project that will be determined on a stage-by-stage basis but minimized for the project in general.

Therefore, the target blocks of creation of the reserves of oil and petroleum products in Ukraine should be:

for the year of 2020 – availability of the motor fuel reserve in the volume totaling 20-day period of consumption in normal demand conditions;

for the year of 2025 – availability of the minimum reserves of oil and petroleum products in the volumes provided for by Directive 2009/119/EC and further amendments thereto;

for the year of 2035 – availability of the strategic energy reserve that guarantees energy security of the country and mitigates the impact of crisis developments in the world markets.

Such an author's approach to the development of tools to ensure the stability of the functioning of the critical infrastructure differs from the adopted and is proposed for discussion. At the same time, this approach calls for extensive involvement of private enterprises in the creation of flexible energy reserve. Thus, the task of forming the stability of the state will

be fulfilled not only by state authorities, but also by the public.

It is suggested that the flexible energy reserve and, in particular, the oil reserve in Ukraine should be created using a mixed private-public model, according to which the reserves are managed by a special agency (association), whose members are market participants and representatives of governmental bodies.

Forming and development of the state-private partnership are critical for the public policy on critical infrastructure protection and it should be regulated by the law, should find methodological, organizational and technical support for coordinated actions. Besides, mutual relations between private enterprises and the state, both in supporting energy reserve system functioning and in exchanging information as per the stipulated requirements will demand regulatory, organizational and technical arrangements in the scope of the state critical infrastructure protection system operation.

During the preparation of regulatory and legal provisions it is necessary to take into account that the components of a flexible energy reserve can be the following:

- insurance reserves of natural gas in the amount of 10 % of the planned monthly volumes of supply to consumers that will be created by its suppliers for their own or raised funds (as established by the Cabinet of Ministers Decree No. 860 dated November 16, 2016)<sup>25</sup>;
- irreducible coal reserves in the total amount of at least 5 million tons that must be created at each thermal power plant and coal handling preparation plants that use this type of fuel, as well as in enterprises that use coal as raw materials and in the state reserve (currently the State Agency for Reserve of Ukraine does not have coal reserves, although this type of fuel is present in the storage nomenclature<sup>26</sup>, and only 1 million tons of irreducible coal reserves form only thermal power stations<sup>27</sup>).

To this end it is recommended that:

1. The applicable legislation should be

25 <http://zakon3.rada.gov.ua/laws/show/860-2016-%D0%BF>

26 [http://press.liga.net/conf/yur\\_y\\_brovchenko/](http://press.liga.net/conf/yur_y_brovchenko/)

27 <http://www.nerc.gov.ua/?id=22070>



complemented with normative legal acts that would regulate organizational and economic principles of creation and management of flexible energy reserve, including development of mechanisms and conditions for its creation, storage, release (use) and renewal.

More specifically, petroleum products for the purposes of creation of oil reserves should be purchased in the event of a pressing need and during the periods of the estimated decrease of the oil prices taking into consideration the 2...3 weeks of time lag. The reserves should be renewed twice a year during the period of the estimated increase of the oil prices, but by not more than 25 %. At the same time, estimation of the price dynamics should be done with the help of theoretical models based on hypotheses about the economic processes taking place in the fuel market.

2. An institutional structure should be established for management of the energy resources, which process includes:
  - creation of a management body that within the framework of its terms of reference will establish the reserve structure and manage it;
  - involvement of participants of the energy products market in the process of creation of the reserve;
  - development of the rules of procedure regulating work of all participants of creation, maintenance, and functioning of the reserves;
  - separation of the reserves of oil and petroleum products from the state reserves for the special period, state reserve stock, stabilization reserves, and other special-purpose reserves of the country.
3. A system for publishing information about creation, storage, release (use), and renewal of the reserve should be developed.
4. The infrastructure of reserves of energy products should be created taken into consideration the needs of the regions as well as the reservoir fleet available in their territory.

For storing crude oil, in addition to the reservoirs of oil processing plants and main

oil pipelines, underground storage facilities can be used (for instance, in Solotvyn, Ivano-Frankivsk Oblast, in Hoholeve and Lubny, Poltava Oblast). After the USSR collapsed, these natural reservoirs that can exist for 15...20 million years became unnecessary, although in the 1990s the Institute of Geological Sciences of the National Academy of Sciences of Ukraine drafted a program on their use. The explanatory note to the draft program emphasized that the respective adjustment of salt caverns of the Dnipro-Donets Rift, Transcarpathia and Carpathian region as well as the Southern Buh Delta will cost 30% less compared to construction of oil depots on the ground. The cost of underground reservoirs with an overall capacity up to 3,000,000 tons (50...200 thousand cubic meters each) will total around \$80 million, and this amount can be much less if the already existing facilities are taken into account.

The principal mechanisms of financing creation of energy reserve in Ukraine should be:

- purchase of energy products with the funds received as a result of increasing taxes. In order to create the oil reserve for 90-day period norm within six years, it will be enough to increase the excise duty for gasoline and diesel fuel by 32 and 30 EUR/t. At the same time, one should explain to the citizens of Ukraine the need for this step and at a legislative level ensure the earmarked use of these funds for creation of the reserves;
- the reserve agreements that provide for a possibility to buy out the reserves owned by other companies at any time for the market prices. Respective services are provided to the agencies that do not have sufficient reserves by international banks, among others, by Goldman Sachs, at 2...3 %<sup>28</sup>.

The formation of a flexible energy reserve, which will consist of various types of fuel and energy, will ensure the sustainable functioning of all sectors of the economy, and not just transportation (as provided by the oil reserve), and will be a step towards the creation in Ukraine of a critical infrastructure protection system.

<sup>28</sup> Such offer was already received by National Joint Stock Company *Naftogaz of Ukraine* in May 2012.

## CONCLUSIONS

**The level of the Government's activities related to the implementation of Directive 2009/119/EC remains low. Insufficient performance, absence of demands, low executive discipline, and reorganization of a number of institutions responsible for the implementation of commitments resulted in a failure to implement the 2015-2016 tasks within the previously identified time lines despite the clear goals, developed plans, available support from the European partners and establishment of several inter-agency working groups.**

In view of this, it is deemed necessary to:

- identify the causes for the failure to implement Ukraine's international commitments set forth in the Plan of Implementation of Directive 2009/119/EC;
- set the time lines for implementing the tasks provided for in the Implementation Plan using policy analysis procedures;
- assign the central executive bodies responsible for formulation of policy in the respective spheres as the responsible agencies implementing the tasks that imply development of legal acts (such as draft laws "On Minimum Reserves of Oil and Petroleum Products", "On Strategic Reserves");
- establish personal liability of the heads of central executive bodies for achievement of the tasks included in the Implementation Plan.

To ensure further development of the system of collective energy security of Europe, Ukraine should initiate creation in the EU member states of the reserves of facilities in oil refining, coal, oil and gas industry, nuclear and renewable electricity industries taking into consideration the possibility of a rapid change in the structure of consumption of energy resources.

Creation of such energy reserve should be based on the following theses:

- every consumer should have a possibility to use different sources of energy at different time;
- the energy consumption structure should be determined taking into consideration economic and environmental feasibility;
- fuel and energy production should be decentralized, and energy flows should be disaggregated;
- the energy reserve in every region is created taking into account the energy consumption structure and various time of seasonal load.



