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**COMBATING
ILLICIT ENERGY
TRADE IN THE
STRATEGIC
IMPERATIVES
OF
DIVERSIFYING
IMPORT
DEPENDENCE**

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Abstract

Empirical studies of the hierarchy of the state's needs clearly demonstrate the relationship between the realization of its national interests and the effectiveness of foreign policy on import substitution, in particular, overcoming dependence on the energy deficit by means of legal trade, and identify the need for energy resources as a priority. Also, a way to counter the illicit trade in energy resources has been identified in the context of the development by countries within the framework of their national strategy of prioritizing the diversification of resources (including energy) that provide primary needs, determining the role of the security factor in the absence of extreme dependence, by avoiding confrontations with the monopolist and the possibility of alternative choices within the framework of national security interests. A matrix methodology for choosing a strategy for diversifying import dependence on energy resources by states has been developed and tested. A conceptual approach to the diversification of energy dependence in the state strategy to prevent participation in illicit trade

in energy resources has been formed, taking into account the margin of safety in the absence of extreme dependence based on the introduction of the “last hope” supplier.

Keywords: *illicit trade, energy resource, global producers, strategy, import dependence, “last hope” supplier.*

Introduction

Rudolf Kjellen, a Swedish political scientist, geographer and politician saw the state as a living organism, where geographical space is its “body” and the nation is the “soul” (Tunander, 2001). Similar parallels can be drawn with the state and its national interests. A clear example can be the availability of natural resources. Energy resources are highly profitable and allow the owner countries to speculate on the basic needs of the population of import-dependent countries. Some countries that are large exporters of energy resources (such as oil, gas, coal) can have a high level of income from their sale. This can give them economic importance and allow to exert a significant influence on world prices for energy resources. These countries can use their position as energy producers to secure their political or economic weight. This may include strategies to influence import-dependent countries through manipulation of energy prices or changes in production. Countries that are dependent on energy imports can be significantly affected by changes in prices or access to resources. This can put their economies at risk and make them vulnerable to external influences. To reduce the risks associated with dependence on specific energy resources, import-dependent countries can emphasize the diversification of their energy sources and the development of renewable sources. However, external political factors have a significant impact on the economic situation in the global energy market.

This study considers theoretical justification for the emergence and spread of illicit trade in energy resources is presented by deepening the state of import dependence of countries that do not include in their own national strategy the priority of diversifying sources of energy resources deficit coverage. An important task that will help to avoid import dependence to counter illicit trade on the international market is developing a strategy of action.

State-of-the-Art. After the full-scale invasion of Russian troops on the territory of Ukraine on February 24, 2022, the rules of the game on the international export market have changed significantly. According to the European Central Bank, the war in Ukraine led to a sharp increase in the prices of energy resources and significant instability in the energy markets. Oil, coal and gas prices have changed significantly, especially since Russia's invasion of Ukraine. In the first two weeks after the invasion, oil, coal and gas prices rose by about 40%, 130% and 180% respectively. Gas prices also pushed up wholesale electricity prices in Europe (The impact of the war...).

In 2019, Russia produced 12% of the world's oil, 5% of coal and 16% of gas. In 2021, Russia was the largest supplier of energy goods to the Eurozone countries, accounting for 23% of total energy imports (Figure 4.1) (Five Charts Explaining...).

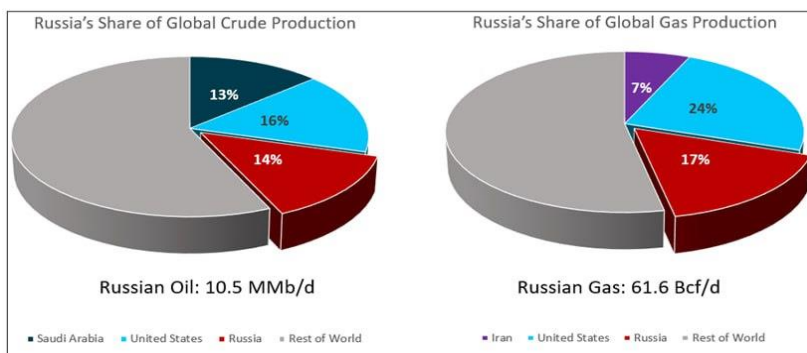


Figure 4.1 Russia is one of the largest global producers of both oil and gas

Source: Five Charts Explaining the Global Impact of Sanctions on Russian Energy Exports

According to the International Energy Agency, the recovery in global energy consumption that followed the pandemic ended prematurely with the start of Russia's invasion of Ukraine in 2022. This led to a crisis in global energy markets, increased inflationary pressures and a slowdown in economic growth [4]. Sanctions against Russia have also affected oil and gas exports from Russia. According to the BBC, prior to Russia's invasion of Ukraine, Moscow earned more than \$1 billion a day from oil and gas sales. However, Russia's

total oil and gas exports have declined, and Moscow’s income from energy sales has also declined (6 ways Russia’s invasion...). Substantial sanctions against of Russia’s energy industry would have far-reaching consequences for both global oil and gas markets. Prior to the Ukraine invasion, gas reserves in Europe were already below the levels observed since 2021, with imports from Russia historically serving as a crucial means to refill storage. Emphasizing the difficulties posed by European energy sanctions, the influx of Russian gas into Western Europe through Ukraine and Belarus has increased by 23% since the onset of the Ukraine invasion (Figure 4.2) (Five Charts Explaining...).

In general, the war in Ukraine and sanctions against Russia have led to significant changes in the global energy market, increased prices for energy resources and instability in energy markets.



Figure 4.2 Russian gas flows into Western Europe via Ukraine and Belarus

Source: Five Charts Explaining the Global Impact of Sanctions on Russian Energy Exports

According to the European Commission, in 2021 Russia was the largest supplier of gas to Europe, accounting for 43% of total gas imports (Share of gas supply...; National Reliance on Russian...). The dependence of the countries of the European Union on gas supplies from Russia has several consequences. First, it can lead to economic vulnerabilities due to fluctuating gas prices, supply disruptions or geopolitical tensions. Second, Russia can use this dependence as a

tool of political pressure, influencing EU policies and decisions. Third, it raises the issue of energy security in the EU, which prompts discussions on the diversification of energy sources and suppliers.

In 2019, Russia was the sole provider of natural gas for North Macedonia, Moldova, and Bosnia and Herzegovina. Latvia, another European nation, relied heavily on Russian gas, which constituted more than 90% of its total gas supply in 2021. However, in Estonia, the percentage of natural gas imported from Russia was considerably less, at 12%. In 2021, Russia was responsible for more than 39 % of all natural gas imports outside the European Union (Share of gas supply...).

Globally, Russia stands as the top exporter of natural gas, surpassing the exports of the United States, Qatar, and Norway. In the year 2021, Russia exported a massive 201.7 billion cubic meters of gas through pipelines and an additional 39.6 billion cubic meters of liquefied natural gas (LNG). From 2014 to 2019, there was a steady increase in exports. However, in 2020, there was a four percent drop in volume due to reduced fuel demand caused by lockdowns and slowed economic activity during the coronavirus (COVID-19) pandemic (Share of gas supply...).

The invasion of Ukraine by Russia in February 2022 had a significant impact on the exports of Russian gas to Europe. As a result of the conflict, European nations endeavored to decrease their dependence on Russian gas. From January 1 to July 15, 2022, Gazprom, a Russian company, exported over 33 percent less gas to foreign countries compared to the same timeframe in the previous year. Additionally, Germany halted the certification process for Nord Stream 2, and Russia ceased all gas supplies via Nord Stream 1 in September 2022, prior to the detection of leaks in both pipelines. Moreover, there was no monetary increase in gas exports from Russia to India and China in July and August 2022 compared to February and March 2022.

According to (Europe's dependence on Russian...), Europe pays Putin \$ 285 million daily due to its reliance on imported oil. The international community is urging Europe to participate in a worldwide embargo on Russian oil to cease financing Putin's war in Ukraine. The analysis indicates that Russia earned \$ 104 billion from oil exports to Europe and Great Britain last year, surpassing its gas

revenues of \$ 43.4 billion.

More than a quarter of Europe's crude oil is sourced from Russia, indicating a significant dependency. Some European nations, such as Slovakia, rely on Russia for over 90% of their oil. However, the analysis suggests that the overall dependence of the continent, while substantial, can be overcome. In contrast to gas, the majority of oil imports into the region are transported via oil tankers and ports (How Russian fossil fuel...). Only between 4% and 8% of Europe's oil supplies are delivered through Russian pipelines, which account for up to 30% of total Russian oil exports to Europe. This implies that it is feasible to source oil from other locations in the short term (Hatipoglu et al., 2022).

The proposed methodology

Diversification processes in energy trade and related sectors of the world economy are considered today not only in the context of minimizing financial risks and forming additional or alternative sources of profit, but also as a way to improve the mechanism for using the exogenous potential of the state, which actualizes the study of strategies for diversification of import dependence on the purchase of energy resources from a monopolist.

At the same time, it is controversial to choose the type of state strategy for diversifying import dependence on energy resources among the following: priority interaction with the monopolist, internal protectionism and avoidance of extreme dependence (Dumanska, 2022).

For the purpose of economic justification, an analytical matrix for choosing a strategy of action has been developed and economic calculations were provided to confirm the correctness (Table 4.1).

For the preliminary selection of possible diversification strategies, a matrix for choosing the type of diversification was clearly presented, based on the motives for avoiding extreme import dependence on the purchase of energy resources from a monopolist. Based on the reasons that prompt the decision to implement a specific strategy(s) at the disposal of the state (strengths that give it a competitive advantage or that allow it to realize its existing potential more extensively). We can choose not only one, but several types.

Table 4.1

An analytical matrix for choosing a strategy of action

Type of strategy	Potential Indicators					In General
	Finance	Alternative energy resources	Energy resources (Fossil)	International treaties	Security	
Priority interaction with the monopolist	1	0	1	1	0	3
Internal protectionism	1	1	1	0	1	3
Strategy to avoid extreme addiction	0	1	1	1	1	4

At the same time, taking into account the motivating reasons, 13 parameters were provided, corresponding to the type of behaviour strategy. Each criterion was assigned an evaluation score of 1/0, omitting the criterion of 0, summing up the points to get the right choice (Table 4.2).

Table 4.2

A matrix for choosing the type of diversification strategy based on motivational reasons

Type of strategy	Motivating causes													In General
	Ensuring Competitiveness and Profit Generation	More complete utilization of production capacities	Search and implementation of alternative options for the use of raw materials, materials, technology	Achieving synergies	Implementation of a resource-saving policy	Economies of scale	Conquering new markets	Efficient use of economically limited resources	Distribution of risk between industries	Ensuring economic stability and financial stability	Expansion of market share	Preservation of production potential	Future Condition Insurance	
Priority interaction with the monopolist	0	1	0	0	0	1	0	1	0	0	0	1	0	1
Internal protectionism	1	1	1	1	1	1	1	1	0	0	1	1	0	5
Strategy to avoid extreme addiction	1	0	1	1	0	0	1	0	1	1	1	0	1	7

The authors propose a certain hierarchical structure of the decision-making system on the advantages of a specific strategy (set of strategies) of diversification for the foreign (exogenous) policy of a particular state, which is presented in Figure 4.3.

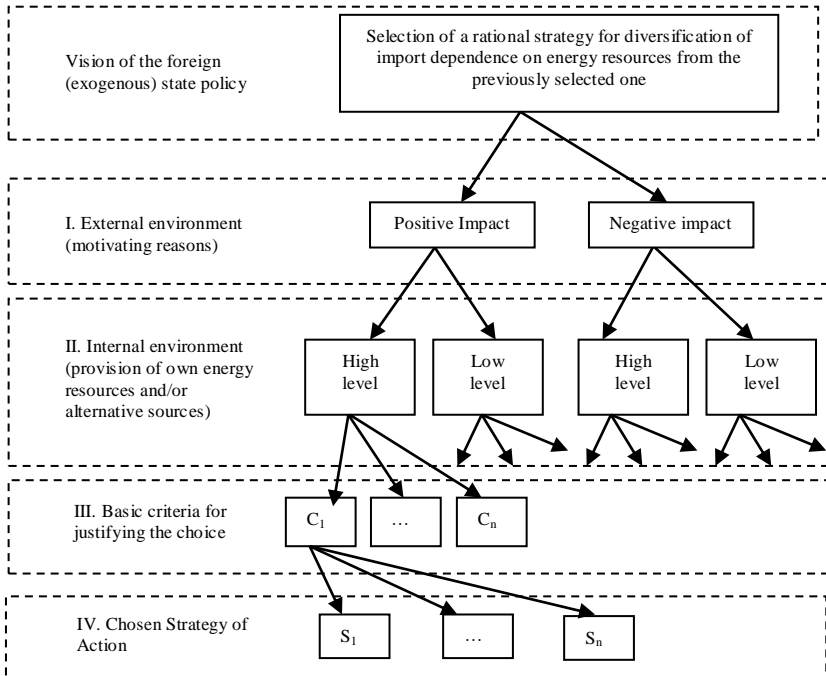


Figure 4.3 Hierarchical structure of the decision-making system for choosing a rational strategy for diversifying import dependence on energy resources

At level I, a generalized assessment of market opportunities and threats is performed.

At the second stage, there is a generalized assessment of the state's competitive potential.

At the third stage, there is a pairwise comparison and determination of the weight of the evaluation criteria ($C_1 \dots C_n$).

At the IV stage, there is a multi-criteria evaluation of strategies ($S_1 \dots S_n$) and the selection of the most rational of them.

To assess the favourability or unfavorability of the state of the external environment from the point of view of the analysed strategy, an extended scale of assessment from -10 to +10 is proposed. This will increase the degree of differentiation of the assessment, more clearly divide the options for the compared solutions. The negative (left) part of the scale (-10 – 0) is intended for assessing the factors that have a negative impact (market threats). Positive (0 – +10) – factors that have a positive impact (market opportunities).

Combining estimates of different factors should be carried out according to well-known rules (Stiglitz, Weiss, 1981), while transforming them in accordance with changes in the rating scale. Thus, with the author’s refinements, the rules for combining estimates expressed by confidence coefficients take the following form (4.1-4.3):

$$K_0 = K_1 + K_2 \times \left(\frac{10-K_1}{10}\right), \text{ if } K_1 > 0 \text{ i } K_2 > 0 \quad (4.1)$$

$$K_0 = (|K_1|+|K_2| \times \left(\frac{10-K_1}{10}\right)), \text{ if } K_1 < 0 \text{ i } K_2 < 0 \quad (4.2)$$

$$K_0 = \frac{K_1+K_2}{10-\min(|K_1|,|K_2|)} , \text{ if } K_1 \text{ i } K_2 \text{ have different signs} \quad (4.3)$$

Depending on the specifics of the state and the conditions of the external environment, in accordance with the branches of the decision tree, regarding the choice of rational strategies (Figure 4.3), the significance of the criteria will be different.

The authors propose to determine the significance of criteria at each level of the decision-making system (Figure 4.3) by the method of pairwise comparisons on the scale given in Table 4.3.

Table 4.3

Pairwise Comparison Scale

Relative importance in points	Ordinal Scale Score
1	The parameters are equivalent
2	One parameter is more important than the other
3	Significant advantages of one of the parameters
4	Sufficient advantages of one of the parameters
5	Absolute advantage of one parameter over another

This scale is further used for pairwise comparisons of the above criteria at level III of the decision-making system according to the diagram in Figure 4.3. At the intersection of the columns with the rows of the matrix, scores are put down that characterize the position of one criterion in comparison with another. The comparison is performed by rows: the criterion of the first row is compared with the criteria in the columns; If when comparing, for example, the second criterion with the third, the expert assessment is 3 (significant advantages of the second over the third), then when comparing the third with the second, the score is 1/3.

Thus, the weight characteristics of the evaluation criteria are determined, according to which the most rational diversification strategies should be chosen. Next, we will calculate the relative scores of alternative diversification strategies according to the selected set of criteria using the method of pairwise comparisons, using a scale for this. The analysis and evaluation were performed for the leftmost branch, which is shown in Figure 4.3 (Level IV – Choosing a Strategy of Action).

The relative score of the analyzed strategy (one of the three alternative ones under consideration) is performed as a result of dividing the sum of estimates in the row of the corresponding Table of pairwise comparisons by the sum of estimates of all rows in the same Table.

Table 4.4

Calculation of generalized estimates of diversification strategies priority

Diversification strategy	Summarizing Indicators of Strategy Priorities Diversification
Priority interaction with the monopolist	0,217
Internal protectionism	0,321
Strategy of extreme addiction avoidance	0,462

The best strategy is the one that has a higher value of the generalizing indicator of the priority of diversification strategies (see Table 4.4 – the last column). For Table 4.4, this is a strategy to avoid extreme dependence. Similarly, the analysis is carried out for all branches of the structure shown in Figure 4.3. The final choice

should be made by comparing the best strategies (sets of strategies) selected above according to the risk/economic result criterion from the implementation of the strategy.

The proposed methodical approach to the choice of the State strategy for diversification of import dependence on energy resources, based on the existing external economic conditions and the state of the strategic potential of the State, clarifies the set of characteristics of the external environment and motivating reasons, which allows a more complete assessment of their state and provides a justification for mathematical selection from the type of strategies of other types.

Results and Discussion

Based on the presented methodical development, we have formed a further conceptual approach to diversification of energy dependence in the state strategy to prevent participation in illicit trade in energy resources, taking into account the margin of safety based on the following imperatives: strengthening the security approach to management due to the absence of extreme dependence on energy; avoiding the formation of monopoly statuses among energy suppliers; inclusion in Strategies for diversification of import dependence of the Institute is the supplier of last resort. Schematically, the approach is presented in Figure 4.4.

Conclusions

The profitability of energy resources allows countries that own them to exploit the basic needs of import-dependent countries. Illicit trade in energy resources, and the benefits derived from it, render any sanctions ineffective due to the primary duty of each state to guarantee its citizens the right to meet primary physiological needs. This is a fundamental function of the state – security. As a result, it has been found that the influence of energy carriers on import-dependent countries is increasing as they fall into a trap of needs. The main problem is that these countries do not diversify their energy supply sources, thereby creating monopolies and compromising their own security.

To counter illicit trade in energy resources, it is proposed that import-dependent states improve their own development strategies.

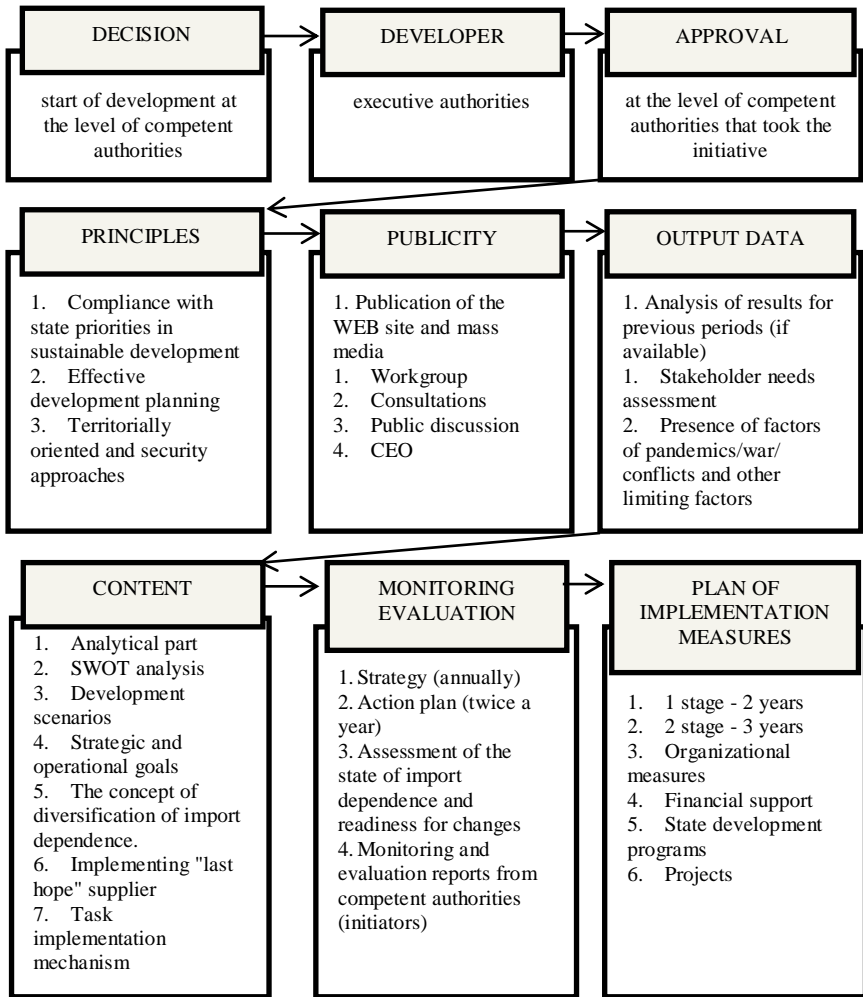


Figure 4.4 Conceptual approach to diversification of energy dependence in the state strategy

Source: (Dumanska, 2023)

This can be achieved by adjusting their strategies at the development stage to include the concept of diversification of import dependence and the introduction of a “last hope” supplier. During this study matrix methodology for choosing a strategy for diversifying import

dependence on energy resources by states has been developed and tested. A conceptual approach to the diversification of energy dependence in the state strategy to prevent participation in illicit trade in energy resources has been formed, taking into account the margin of safety in the absence of extreme dependence based on the introduction of the “last hope” supplier.

Additionally, the safety approach in management should be strengthened by avoiding extreme dependence on energy and preventing the formation of monopoly statuses among energy resource suppliers. This approach will ensure the security and well-being of the citizens of import-dependent countries.

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**THE ADVANTAGES
AND RISKS OF THE
SPREAD OF
ARTIFICIAL
INTELLIGENCE IN
THE WORLD IN
THE CONTEXT OF
THE POSSIBILITIES
OF ITS USE IN
UKRAINE DURING
AND AFTER THE
WAR**

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Abstract

The article highlights the benefits and risks for society caused by the spread of artificial intelligence technologies in the global economy. Under their prism, the possibilities of using artificial intelligence in Ukraine during and after the war to counter Russian aggression, post-war economic recovery, and accelerated overcoming of socio-economic