

Directions of development of Poland's critical infrastructure in the context of challenges to regional security and energy transition. Pillars of security in oil and fuel supply in the Central European and Baltic Sea region in the years: 2013-2023

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Directions for the Development of Poland's Critical Infrastructure in the Face of Regional Security Challenges and Energy Transformation. Security Pillars for Oil and Fuel Supplies in the Central European and Baltic Sea Region in the Years: 2013-2023

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Executive summary – key findings

- GK PERN in the years 2013-2023 carried out a series of investments aiming to strengthen the energy security of Poland and the countries in the Central European region in the area of crude oil and motor fuels supply. The political consensus on the need to improve energy security in terms of the reliability of oil and fuel supplies has supported the ongoing investments. There is a deep rationale for continuing and strengthening this cross-party security strategy. The reason is the increased threat due to Russia's military aggression against Ukraine.
- The delivery, collection, and logistics system for crude oil and petroleum products, built by GK PERN, has demonstrated a high level of resilience to threats associated with a complete change of supplier and adaptation to the significantly altered geography of oil and fuel imports. As a result of the actions taken by the Polish oil industry, wholesale fuel recipients, as well as individual consumers in the country, and business partners in Germany and Ukraine, were provided with continuity and regularity of supplies while simultaneously imposing an embargo on Russian crude oil and fuel.
- As a result of the actions taken, deliveries from a politically and militarily threatening producer were replaced with imports from trusted and reliable partners. It seems that in the implementation of adaptive actions by GK PERN to the changing challenges for the energy security of Poland and the region, managerial competencies within the company and experience related to the challenges for the oil and chemical industry in the coming years are of significant importance.
- In terms of military security, it is important to ensure fuel supplies for the Polish Army, NATO allied forces, and US troops on Polish territory. The top priority becomes the extension of the NATO pipeline system to the territory of Poland, including the key CEPS product pipeline, which is of paramount importance in fuel supplies for NATO forces on the eastern flank. Polish PERN, especially over the last 10 years, has proven to be an entity that could take on this task. GK PERN carries out inspections of pipelines located on the territory of Belgium, which are part of NATO's fuel infrastructure.

- The investments carried out by GK PERN in recent years have not sparked controversy or political disputes. It is crucial to ensure continuity of the implemented investment strategy combined with the use of competencies related to development in areas such as liquid chemicals and renewable energy sources.
- The goal for the coming years should be to continue the direction of the current projects aimed at increasing the stability of crude oil and finished fuel supplies, while enabling the development of new business sectors and taking into account new trends in energy and the changing international security environment.

Changes in the architecture of energy security in the European Union, Central Europe, and the Baltic Sea region in terms of crude oil and fuel supplies caused by Russia's aggression in Ukraine

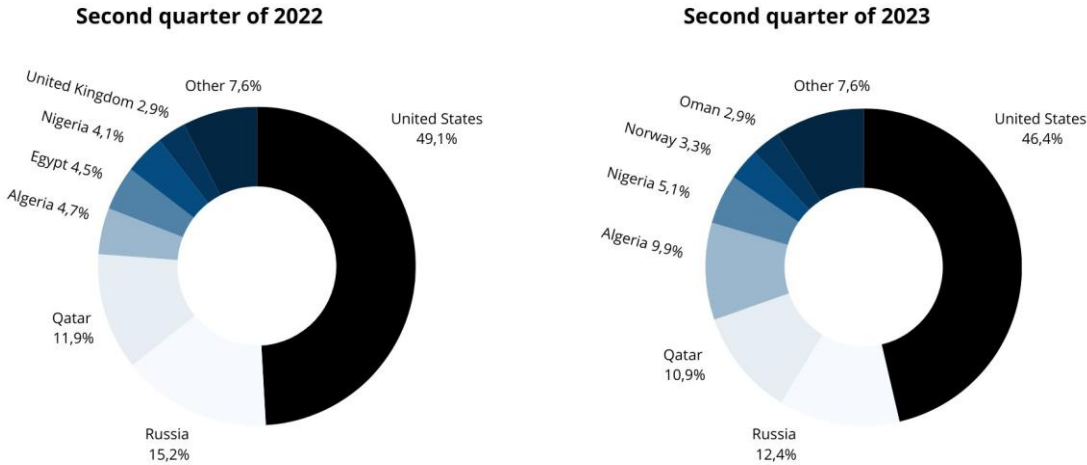
The aggression of the Russian Federation against Ukraine has necessitated a redefinition of strategic priorities in the energy sector related to crude oil and petroleum products. The challenges related to setting new, key goals are much more difficult for the countries in the Central European and Baltic Sea region than for those located in the western or southern parts of the European Union. Countries located geographically closer to the Russian Federation, due to the existence of inland oil pipelines allowing for cheaper import of raw materials from the east and the proximity to the producer-country, were significantly more dependent on Russia than other European Union countries. The response to the aggression against Ukraine was the imposition of an embargo by the European Union on Russian oil imported via land routes, as well as setting a low price for oil transported via maritime routes at USD 60 per barrel. These actions were accompanied by further sanctions on the purchase of petroleum products from Russia, as well as a political commitment that all European Union countries will completely abandon the purchase of raw materials and fossil fuels from Russia by 2027. The aforementioned measures are aimed at stopping Russia's ability to continue the war against Ukraine by imposing heavy penalties/sanctions on the Russian society and economy. It should be strongly emphasized that from the perspective of the strategic interests of NATO's allied countries and the European Union, the consistent implementation of the indicated actions is fundamentally justified. Taking into account the statistical data covering all EU countries, it is evident that Russia's share in the EU's import of petroleum products has been continuously decreasing since the second quarter of 2022. It fell from an average of 8.7 million tons in the second quarter of 2022 to 1.6 million tons in the second quarter of this year. This means 82% decrease. On the other hand, imports from suppliers other than the Russian Federation increased by 5.8 million tons, from 31.5 million tons to 37.3 million tons⁷.

From the perspective of Poland, Central Europe, and the Baltic Sea region, it should be noted that the import of Russian oil and fuels was significantly higher than the EU statistical average. Thus, the challenge facing PERN Group, which manages critical oil and fuel infrastructure,

⁷ Eurostat, [EU imports of energy products continued to drop in Q2 2023](#).

is significantly more challenging than for other logistics operators in this sector operating in Western Europe. The embargo and the cut-off of supplies via the ‘Friendship’ inland waterway have made Poland’s and the region’s energy security dependent on maritime deliveries. In this context, the reception capacity, and the entire logistical infrastructure of GK PERN, such as: raw material and product marine terminals, warehouses, oil and fuel pipelines, as well as their efficiency and flexibility, have become a kind of key and essential element ensuring the energy security of Poland and the region.

Figure 1. EU imports of petroleum oil, Q2 2022 and Q2 2023.



Own compilation on the basis of Eurostat data.

The role of GK PERN in ensuring energy security through the development of raw material and fuel infrastructure for the reception of raw materials and finished fuels

Investments carried out by GK PERN in recent years have not sparked controversy and political disputes. They were also implemented under the conditions that Poland had to stop importing oil and fuels from Russia. In the coming years, at least a directional continuation is justified, primarily due to the projected further increase in domestic demand for fuel, but also in view of Poland's political interest and its alliance. As a result of the war, Poland has become the main fuel supply route to Ukraine, strengthening the resilience of the state and sustaining its defence capabilities, as well as meeting the needs of the economy and civilian population. Poland should continue to increase its capabilities in terms of fuel supplies to other countries in the region and, depending on the needs, expand its network infrastructure and storage capacity. Investments in this area will strengthen not only energy security, but also defence and political potential. Undoubtedly, one of the challenges will be to add value to the existing competencies of the PERN Group through development in new areas such as liquid chemicals, which the operator has already recognized and decided to utilize.

In recent years, GK PERN has implemented investments worth over PLN 3 billion, which have increased the total capacity of the company's storage facilities from around 3 million cubic meters to 4.1 million cubic meters for oil and approximately 2.65 million cubic meters for fuels, including gasoline, diesel oil, heating oil, bio-components, and aviation fuel. It also currently manages an approximately 2,600-kilometer pipeline network, including the Polish section of the Friendship oil pipeline and Gdańsk's Naftoport. The latter can nominally receive 36 million tons of crude oil and 4 million tons of petroleum products annually, allowing for full coverage of domestic demand.

In recent years, the expansion of the transmission and warehouse infrastructure has been carried out by the company as part of the 'Megainvestments' programme. The key network project was the completion in 2023 of the construction of a 97-kilometer Boronów-Trzebinia product pipeline (with a capacity of 1.5 million cubic meters annually), which constitutes an extension of the transmission system from Płock-Koluszki-Boronów. It enables the transportation of finished fuels (primarily diesel oil) from the Płock refinery to the Orlen terminal in Trzebinia. Thanks to this, they no longer have to be delivered by rail tank cars, which reduces logistics costs. Additionally, the pipeline allows Orlen to increase its competitiveness in Małopolska region, to which MOL has been exporting increasing amounts

of fuel, using its refinery in Bratislava for this purpose in recent years.

The expansion of the storage capacity of GK PERN and the increase in the diversification of oil supplies was served by the construction of a total of 13 new raw material tanks with a total capacity of approximately 1 million cubic meters. Two of them (each with a capacity of 100,000 cubic meters) were placed in the Gdańsk Base in 2020, increasing their quantity to 20 and their total capacity to 1.1 million cubic meters.⁸ . At the same time, a two-stage expansion of the Gdańsk Oil Terminal was being carried out. As part of the first phase, which began in 2013 and ended in 2016, PERN launched six tanks with a capacity of 62,500 cubic meters each (a total of 375,000 cubic meters), and in 2021 completed the second phase, related to the construction of five additional tanks, which increased the total capacity to 765,000 cubic meters.⁹

As part of the ‘Megainvestments,’ GK PERN also developed its potential in the area of fuel storage. In total, since 2016, the company has built 28 fuel tanks with a total capacity of 830,000 cubic meters. New tanks have been set up at bases in Koluszki, Nowa Wieś Wielka, Rejewiec, Dębogórze, Boronów, Emilianów, and Małaszewice.

There are also plans for further expansion of the fuel capacity of the GK PERN base in Dębogórze, for which nearly PLN 400 million will be jointly allocated with the Management of Morski Port Gdynia S.A. Thanks to this investment, even more fuel will be reaching Poland by sea. The main goal of the project is to enable the unloading of tankers with a capacity of over 120,000 tons and the ability to store and quickly distribute products further inland. During the first 10 months of 2023, the terminal in Dębogórz received approximately 3 million cubic meters of diesel, which is 1 million cubic meters higher than in the same period in 2022, confirming the significant role the base plays in ensuring Poland’s energy security.

The investments carried out in the last decade by GK PERN were a response to the demand in Poland for oil and fuel. The first domestic refineries processed 25.2 million tons in 2012, while ten years later – in 2022, it was already around 27 million tons. In 2012, on the other hand, Poland’s consumption of the three main types of liquid fuels (gasoline, diesel and LPG)

⁸ PERN, [Rozbudowa parku zbiornikowego w Bazie Gdańsk](#) [*Extension of the tank park at the Gdańsk depot*].

⁹ PERN, [Terminal Naftowy w Gdańsku – II etap](#) [*Gdańsk Oil Terminal – Phase II*].

was around 23.4 million cubic meters,¹⁰ but by 2022, it had already reached around 35 million cubic meters.¹¹ This means that there has been an increase of nearly 33% in fuel consumption in Poland over ten years. Domestic production capacities do not cover the increased demand, therefore flexible import of oil and fuels is necessary.

¹⁰ POPiHN, Przemysł i handel naftowy 2013 [*Oil Industry and Trade 2013*], p. 19.

¹¹ POPiHN, Przemysł i handel naftowy 2022 [*Oil Industry and Trade 2022*], p. 28.

The significance of GK PERN in providing logistics for ready fuels for the needs of the Polish Army, as well as NATO allied forces and US army units stationed on the territory of the Republic of Poland

The full-scale Russian invasion and aggression against Ukraine have caused a fundamental shift in NATO's deterrence and defence policy. At the 2022 Alliance summit in Madrid, it was agreed that further strengthening of the eastern flank would be based, among other things, on the concept of forward defence and deterrence by denial¹². It was also decided to deploy additional forces in Central and Eastern European countries, including increasing the number of allied troops from the level of battalion battle groups to the brigade level, where NATO deems it necessary. Changes in the conceptual and operational dimension mean that the constantly increasing number of allied forces, including American forces, on the eastern flank (also in Poland) will require appropriate logistical and fuel preparation both in peacetime, crisis, and potential armed conflict. In Poland, the pace of logistic-fuel adaptation to the new security environment and technological changes will also depend on close civil-military cooperation.

Since 2022, Poland has become a *de facto* logistics hub for forward defence on the eastern flank, as well as in terms of military support for Ukraine. Currently, Poland provides support, including fuel as the host nation (Host Nation Support, HNS), for over 10,000 US soldiers stationed in various locations in Poland¹³, as well as around 1,000 allied forces stationed in Orzysz¹⁴.

In recent years, the Polish government has been investing in military infrastructure, and in 2020 offered to finance infrastructure and provide logistical support for US forces in Poland¹⁵. As part of the Enhanced Defense Cooperation Agreement between Poland and the United States¹⁶, signed on August 15, 2020, Poland committed to providing logistical and fuel support to US forces, including through the Poland Provided Infrastructure (PPI) and Poland Provided Logistical Support (PPLS) programs. As part of the PPI, Poland has agreed to invest in a large fuel storage and distribution facility at the air base in Powidz, as well as large fuel storage

¹² NATO, [Madrid Summit Declaration](#).

¹³ Ministry of Defense [Zwiększenie obecności wojskowej USA w Polsce \[Increase US military presence in Poland\]](#).

¹⁴ Ministry of National Defense, [Siły sojusznicze w Polsce \[Allied forces in Poland\]](#).

¹⁵ [breakingdefense.com, Poland Agrees To Pay Almost All Costs of US Troop Presence](#).

¹⁶ Ministry of National Defense, [Umowa o wzmocnionej współpracy obronnej pomiędzy Polską a USA \[Enhanced Defense Cooperation Agreement between Poland and the United States\]](#).

facilities at the military training ground in Żagań and the military complexes in Toruń and Skwierzyna. Some PPI projects are jointly funded by the NATO Security Investment Programme (NSIP), Poland, and the United States. On the other hand, under the PPLS, Poland covers 75% of the fuel costs for US forces at agreed locations, including aviation fuel and ground transportation fuel, and 50% of the fuel costs beyond the agreed quantity.

In recent years, military initiatives have been significantly supplemented by numerous investments on the civilian side, which has further contributed to strengthening Poland's logistical and energy resilience. GK PERN – a leading Polish company in the oil and fuel logistics industry – has invested in additional fuel storage and transportation capabilities. In February 2023, GK PERN and Orlen opened a new Boronów-Trzebinia product pipeline, increasing the energy security of the southern part of Poland and also aligning with potential plans to extend the NATO Pipeline System (NPS) to Poland.

Extension of the NPS system to Poland and to the eastern flank of NATO. The potential of the Boronów-Trzebinia pipeline

The Boronów-Trzebinia pipeline may become part of the NPS, for example by connecting to the mentioned Central Europe Pipeline System (CEPS), which currently runs from southern France to central Germany. In times of danger, the installations are used to supply raw materials to military customers, but they also successfully supply civilian clients on a daily basis, such as airports. Expanding the system in Poland would significantly increase the stability and efficiency of fuel logistics within its territory (for both civilian and military facilities – in the event of armed conflict), as well as deepen the integration and interoperability of the Polish military infrastructure with allied forces. Such an investment could also serve as a prelude to further extension of NATO pipelines along the entire eastern flank (including, among others, to Lithuania, Latvia, and Estonia) and potentially Ukraine.

The pillar of the NATO logistic-fuel system based on a multimodal approach is the aforementioned NATO Pipeline System (NPS), which the Alliance began building in the 1950s. In 1958, the CEPS was established and is still functioning today. The CEPS is 5,279 km long and is capable of storing aviation fuel with a capacity of 1.2 million cubic meters. The pipeline, which runs through France, Luxembourg, Belgium, the Netherlands, Germany, is connected to nine storage facilities, 12 refineries, and three civilian product pipeline systems. The CEPS enables the transport of over 12 million cubic meters of aviation fuel annually for both military and non-military purposes¹⁷. From 2023, the CEPS is also capable of transporting sustainable aviation fuels (SAF).

Currently, in light of the Russian aggression in Ukraine and the return to the concept of forward defence and deterrence by denial, the Alliance needs credible access to fuels, for which demand will continue to grow. Properly adapted NPS provides a guarantee of credibility, also in the situation of collective defence (Article 5 of the Washington Treaty). Strengthening the eastern flank of NATO will require the expansion of the allied pipeline system to the countries of this region, including Poland. The absence of the NPS on the eastern flank could negatively impact

¹⁷ Dominik P. Jankowski, The NATO Pipeline System: a forgotten defence asset, NDC Policy Brief No. 8, NATO Defense College, April 2020.

the logistical and fuel stability of the region, undermining the ability of allied troops to move and thus provide adequate deterrence and defence. The work on expanding the NPS to Poland and other countries on the eastern flank has been ongoing since 2019. At the NATO summit in Vilnius in 2023, it was decided that work would continue, with particular emphasis on the military and financial dimensions of a potential expansion project, due to significant negative changes in the security environment and growing logistical challenges on the eastern flank of NATO¹⁸. Secondly, from an economic perspective, the NPS also serves the civilian market. During peace time, the CEPS supplies fuel to airports in Frankfurt, Amsterdam, and Brussels. Commercial use of the system helps meet maintenance and repair requirements, as well as ensure better trained and competent system operators. Furthermore, the generated revenues contribute to reducing operating costs. Obviously, NATO maintains the clause of the highest privilege in the use of the system in times of crisis or war. Thirdly, from an environmental perspective, transporting fuels through pipelines is more environmentally friendly than using rail, water, or road solutions. Pipelines reduce greenhouse gas emissions by 61-77% compared to rail fuel transportation¹⁹. For example, the CEPS transports aviation fuel daily, which is equivalent to 1100 tankers travelling a distance of approximately 400 km on the roads. In practice, this means that using the NPS contributes to the reduction of greenhouse gas emissions by the Alliance.

All three reasons (military, economic, environmental) speak in favour of expanding the NPS to Poland and other countries on the eastern flank. This will create a challenge for GK PERN in terms of creating a concept and actively participating in the national concept of building the NPS in Poland. This will involve, among other things, the need to prepare a comprehensive project for a civil-military system for further work within NATO, adopting legislative solutions enabling close cooperation between the civilian sector and the armed forces, and ultimately selecting a national system operator.

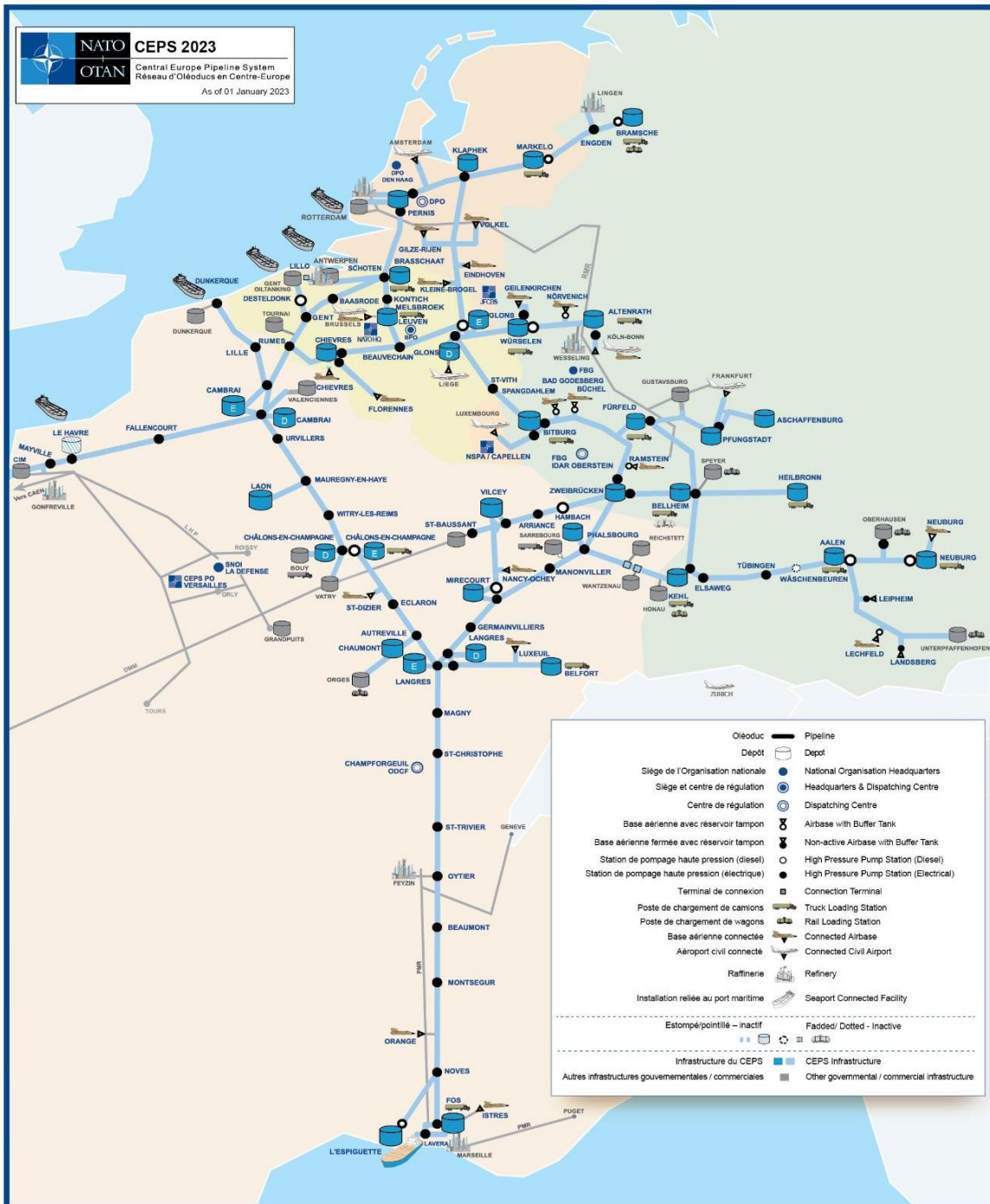
From NATO's perspective, the actions taken by GK PERN in Poland significantly contribute to strengthening the logistical and fuel capabilities of the Alliance's eastern flank. These actions should be continued, in close coordination with the military side based on the national reports of Russian aggression in Ukraine for the energy security of Poland.

¹⁸ NATO, [Vilnius Summit Communiqué](#).

¹⁹ Dominik P. Jankowski, The NATO Pipeline System: a forgotten defence asset, NDC Policy Brief No. 8, NATO Defense College, April 2020.

In further civil-military cooperation to strengthen Poland's logistics and fuel capabilities, it is also important to consider the allied approach to resilience (including energy supply resilience), NATO's new approach to industry cooperation (including the energy industry), and ongoing efforts to expand the NPS on the eastern flank.

Figure 2. CEPS pipeline and PERN's role in its implementation.



NATO Support and Procurement Agency, [NSPA](#)

Transformation of the strategic energy infrastructure towards enhanced support for the chemical industry and the development of hydrogen technologies

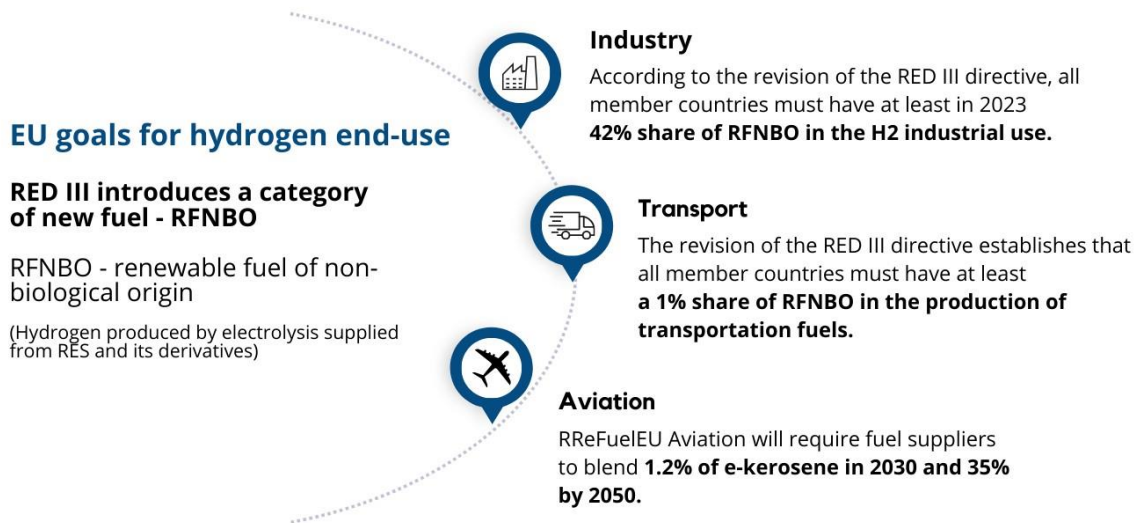
So far, the activities of GK PERN have focused mainly on expanding storage capacity and the transmission capabilities of crude oil and liquid fuels, which directly results from the company's profile as an oil and fuel infrastructure operator. According to public statements by the president of PERN, M. Skowron, the company is currently working on updating its operating strategy for the next few years with a perspective of development until 2050. The prepared document is to be based, among other things, on long-term forecasts regarding the consumption of crude oil and fuels, taking into account the challenges related to the requirements of the Green Deal and the upcoming transformation of the fuel sector²⁰. The first stage of work on updating the strategy has already been completed and concerns the determination of key strategic directions, including, among others, development in the area of fluid chemistry and hydrogen. GK PERN aims to align its long-term operations with the ongoing market changes related to energy transformation and respond to them flexibly²¹, similar to entities in this segment in Western Europe. The specific declarations of how this may look in practice will likely come from the operationalization of the adopted assumptions.

The adoption by the European Union in October of this year of the amendment to the Renewable Energy Directive (RED III) and the ReFuelUE Aviation regulation means that GK PERN will have to incorporate the directions of the adopted changes in the prepared update of its strategy, potentially expanding its operations to the transport and storage of new hydrogen-based energy carriers, such as ammonia. In this case, the key issue seems to be the exposure to the challenges related to RED III on the part of the Polish chemical industry, which accounts for 10% of the entire EU demand for hydrogen. The adopted targets for the use of renewable hydrogen in industry and transport seem extremely challenging or even impossible to meet based on domestic renewable energy sources, considering the energy needs of other industries relying on them. As a result, EU legislation will most likely lead to the emergence of a supply gap in Poland, which could be filled by importing hydrogen in the form of its derivatives, such as green ammonia or methanol.

²⁰ Puls Biznesu, [PERN szykuje plan na zielone czasy \[PERN prepares plan for green times\]](#).

²¹ PAP Biznes, [PERN chce do poł. XI przygotować I etap aktualizacji strategii - prezes \[PERN wants to prepare phase I of strategy update by mid-November – President of the Management Board\]](#).

Figure 3. RED III and the use of hydrogen.



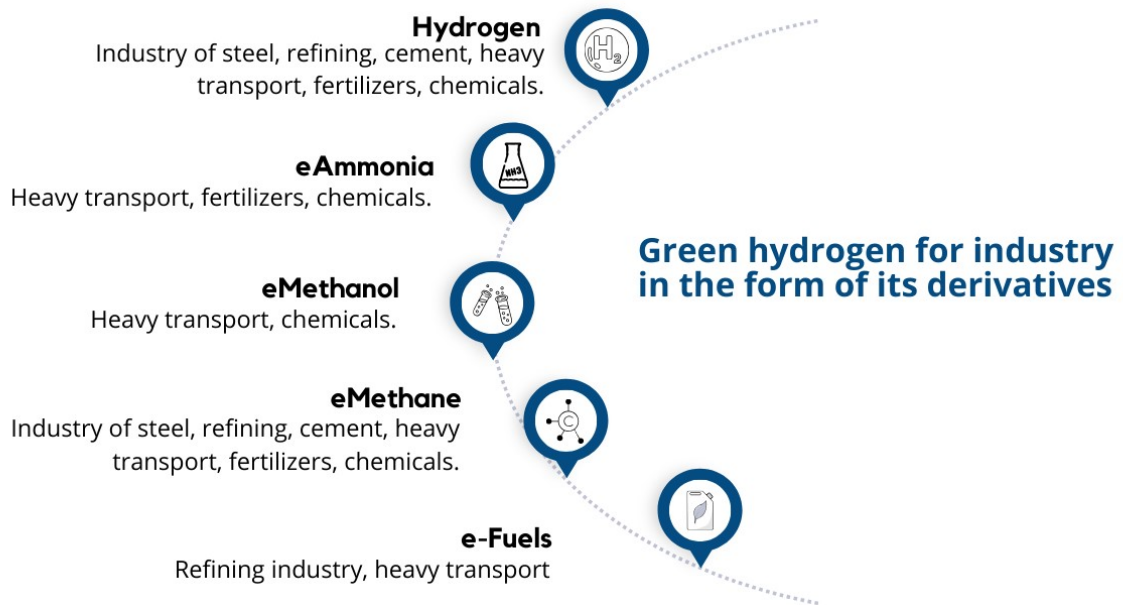
European Commission, [RED III](#).

The specified regulations make chemical plants (Police, Włocławek, Puławy, Kędzierzyn-Koźle, Tarnów) and petrochemical plants connected to the infrastructure of GK PERN (Płock, Gdańsk) the demand centers for imported green ammonia. Additionally, further distribution of green ammonia to chemical plants other than Police or ammonia cracking, if the recipient is a refinery/petrochemical plant, will be necessary. In this case, GK PERN, which owns oil and fuel maritime import infrastructure and has extensive experience in conducting maritime operations, seems to be a natural choice for handling the import of green ammonia for the needs of the Polish chemical and petrochemical sectors or its further distribution within the country. PERN can be inspired by the plans to use the BP oil terminal – NOW-Terminals in Wilhelmshaven for importing green ammonia and creating a hydrogen hub there. The investment involves the construction of an ammonia cracker with a production capacity of 130 kt/year of green hydrogen, which would be further distributed through existing, unused product pipelines²². It seems that GK PERN, as part of its transmission infrastructure transformation plans, may coordinate its actions with OGP GAZ-SYSTEM, which has submitted 3 hydrogen projects for PCI status. One of them is the project ‘National Hydrogen Backbone’ aimed at connecting domestic hydrogen producers, import sources, a hydrogen storage facility in Damasławek, end users, and potential local distribution networks²³.

²²BP, [Wilhelmshaven green hydrogen hub](#).

²³GAZ-SYSTEM, [GAZ-SYSTEM zgłosił projekty wodorowe do nadania statusu PCI \[GAZ-SYSTEM has submitted hydrogen projects for PCI status\]](#).

Figure 4. Green hydrogen for industry in the form of its derivatives.



Own compilation.

Continuing strategic projects for Poland's energy security will be a challenge in the coming years in the sector of oil supply and petroleum logistics.

Continuing in the coming years the projects aimed at ensuring the supply of crude oil and finished fuels to Poland is crucial from the perspective of Poland's economic and energy security, as well as the geopolitical prospects for developing the potential of the eastern flank of NATO alliance. It is also important to increase the possibilities of trade exchange in this area with Ukraine. The outbreak of war in Ukraine has led to a change and diversification of Poland's oil import routes, including increased deliveries of various types of oil by tankers, necessitating a focus on investment priorities for expanding the receiving and transmission infrastructure, including the Pomeranian Pipeline, storage bases, and Naftoport.

The 236-km long Pomeranian Pipeline was launched in 1975. It can transport 25 million tons of oil towards Gdańsk, and 30 million tons towards Miszewko Strzałkowskie near Płock. For this purpose, three pump stations – Pelplin, Łasin, and Rypin – serve the main pipeline. After the suspension of Russian oil deliveries to Poland in February 2023, the pipeline became the main source of raw material supplies to the Orlen refinery in Płock. After meeting its needs (amounting to approximately 16.8 million tons of oil annually), it also sends the raw material to German refineries in Schwedt and Leuna, and the western section of the 'Friendship' pipeline is used for its transportation.

Currently, PERN's activities focus, among other things, on increasing the capacity of the Pomeranian Pipeline. In 2024, a full-scale dosing system for the pipeline, known as DRA (Drug Reducing Agents), a special substance that reduces flow resistance in oil, is set to commence operations. This will allow for an increase in its transmission capacity by up to 30%²⁴, which would mean that the throughput of the pipeline between Gdańsk and Płock will increase by 7 million tons per year.

It seems that regardless of the political option, the current plans should be continued, including the expansion of the Gdańsk Naftoport. On an annual scale, it can nominally receive 40 million tons of oil and fuels, which is 1.5 times more than the domestic demand. At present, Naftoport

²⁴PERN, [Bezpieczeństwo energetyczne: PERN zwiększył przepustowość ropociągu pomorskiego \[Energy security: PERN has increased the capacity of the Pomeranian oil pipeline\]](#).

can accommodate vessels with a length of around 300 meters and a draught of up to 15 meters, which can use five loading stations. There are plans to launch another, sixth facility with a capacity of approximately 9 million tons per year.

The strategic goal of PERN remains to ensure the technical and operational capability to transport new types of fuels across the country. This includes, among other things, E10 fuel (containing up to 10% bioethanol derived from grains), which will be available on the market from January 1, 2024.

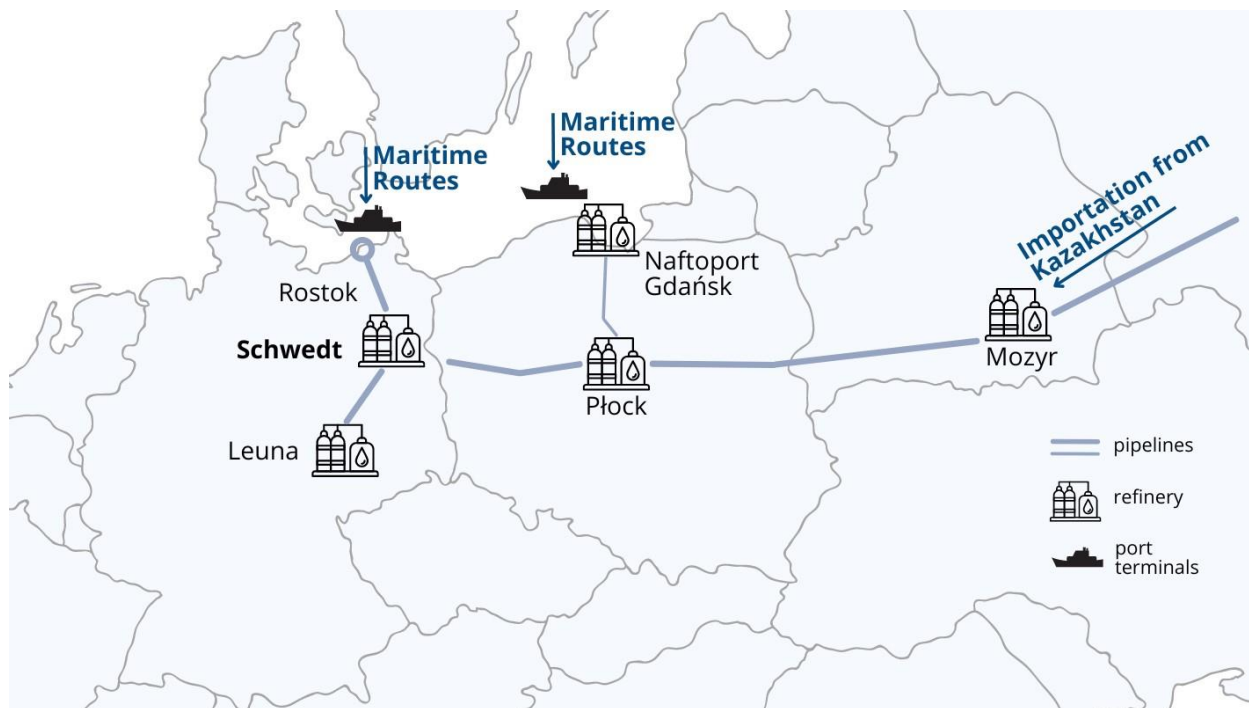
There also seems to be a consensus to extend the European pipelines controlled by the NATO into Polish territory. Expanding the system in Poland would significantly increase the stability and efficiency of fuel logistics within its territory (for both civilian and military facilities – in the event of armed conflict), as well as deepen the integration and interoperability of the Polish military infrastructure with the Alliance.

The significance of GK PERN in ensuring fuel security through diversification of supplies in the region of Central and Eastern Europe and the Federal Republic of Germany

By the end of 2022, almost all of the raw material needs of two East German refineries were covered by imports from Russia. Since the beginning of this year, due to the packages of sanctions imposed on Russia by the European Union, this dependency has changed.

Despite the ongoing changes in the structure of suppliers, due to disrupted land logistics chains and difficulties in effectively and efficiently diversifying sources of supply, oil processing is temporarily limited due to maintenance work at one of the refineries.

Figure 5. Transport directions of crude oil to the German refineries – Schwedt and Leuna.



Own compilation.

If Germany expands the receiving capacity of the port in Rostock and the transmission capabilities to the Schwedt refinery by half, achieving a throughput of up to 9 million tons per year, then in this case GK PERN will be responsible for approximately 50% of the raw material import needs for two refineries located in eastern Germany. If, however, as is likely, the expansion of the pipeline from the port of Rostock is not carried out, then GK PERN will be responsible for at least 75% of the raw material needs of the mentioned refinery²⁵. From the

perspective, it should be emphasized that PERN's role is paramount in ensuring the energy security of the eastern states of the FRG, including the most important one in the German state, the capital agglomeration of Berlin. In this context, the Polish company, servicing two Polish and two German refineries, plays a leading role in ensuring energy security in the production of liquid fuels in the Central European region.

GK PERN is also ready to build the second line of the Pomeranian Pipeline. The formal aspect is fully prepared, including the building permits. The implementation phase of the investment will begin once the business details are finalized, which are primarily influenced by customers from the East German refineries in Leuna and Schwedt. Gdańsk Naftoport, capable of receiving oil deliveries from around the world, would significantly increase its efficiency thanks to the expansion of the Pomeranian pipeline, allowing it to cover the demand for crude oil even more than it does currently²⁶.

Another area of challenges, and at the same time opportunities that fits directly into the current profile of GK PERN's activities, is the issue of strengthening cooperation with Ukraine. It may materialize in the short term, among other things, through the storage of part of the Ukrainian mandatory fuel reserves²⁷ or, in the long term, only after the end of the current Russian-Ukrainian war, i.e. the construction of a two-way Brody-Płock oil pipeline or a product pipeline. The possibility of transporting oil between Poland and Ukraine would increase the implementation of the long-contemplated Adamowo-Brody pipeline construction, which has been under consideration since the 1990s. In the longer term, after the war, the route would allow for deliveries of raw materials to Poland, for example from the Caucasus or the Middle East, through the Ukrainian terminal in Pivdenny near Odessa (with an annual capacity of 14.5 million tons of oil). On the other hand, the pipeline would allow for delivering the raw material to Gdańsk for further distribution to Ukraine. This solution would not only partially (probably to a small extent) help meet the post-war resurgence in demand for oil in this country, but also reduce its dependence on the terminal in Odessa and strengthen Ukraine's political ties with the West.

²⁵ Own calculations.

²⁶ BiznesAlert.pl, [Skowron: Rozbudowa Ropociągu Pomorskiego to kwestia bezpieczeństwa \[Skowron: The extension of the Pomeranian Pipeline is a security issue\]](#).
[The draft law of June 28, 2023, No. 9024-d „Про Мінімальні Запаси Нафти Та Нафтопродуктів”](#), which is after the first reading in the Verkhovna Rada of Ukraine, provides, among other things, that during the State of War in Ukraine, in force since February 24, 2022, fuel importers have the right for 50% of the required liquid fuel reserves to be stored in the Energy Community countries bordering Ukraine and implementing mandatory oil and fuel reserve systems.

Furthermore, after the expansion of the Naftoport in Gdańsk and the construction of the second line of the Pomeranian Pipeline, Adamowo-Brody pipeline could potentially allow for a reduction in the supply of Russian oil to the Czech Republic (including two Orlen refineries in the country), Slovakia, and Hungary. However, the condition would be the necessity of offering the local recipients a cheaper raw material than that sent to them from the ports on the Adriatic via the TAL and Adria pipelines.

The construction of the Adamowo-Brody pipeline could be a prelude to the construction of a fuel pipeline transmitting diesel from Gdańsk to Ukraine, which would replace the currently widely used and very costly road and rail transport. As a result, the creation of a new connection could have significant economic, military, and political implications. One of the major risks associated with the investment is the uncertainty regarding the economic viability of Polish companies using transshipment infrastructure in Ukraine and logistic services, especially in light of the ongoing electrification of transportation. What's more, it cannot be ruled out that after the war, depending on the state of the Ukrainian oil sector, the local market will mainly demand finished fuels rather than crude oil.

GK PERN must also take into account the announcements from other operators of transmission systems in EU countries bordering Ukraine, who are also interested in cooperation with the Ukrainian side. As part of the improvement of diesel fuel supplies to Ukraine, Transpetrol proposed using one of the threads of the Druzhba oil pipeline. It is likely that the funds for the construction or expansion of infrastructure ensuring fuel security in Ukraine after the war will come from the newly established Ukraine's Reconstruction Funds, which will acquire resources from both governments and private entities. In such circumstances, there may also be opportunities for entities such as PERN to expand their influence by leveraging their past experiences, being prepared to make investments, and efficiently acting to meet the region's demand for oil and petroleum products through the acquisition of local company assets.

Conclusions

- The investments carried out by the PERN Group in the last 10 years have not sparked controversy or political disputes. This is due to the fact that they aim to strengthen the energy security of Poland and the Central European region in terms of supplies of crude oil and petroleum products. Continuation of actions seems necessary due to the collapse of the existing security architecture, caused by the aggression of the Russian Federation against Ukraine. Managerial competencies within the company and experience related to the challenges of the energy and chemical industry are essential to implement the complex and difficult adaptation program of GK PERN to the upcoming key challenges in the coming years.
- The war against Ukraine has had far-reaching consequences for the entire Central European region, the Baltic states, and the European Union. The Community embargo on Russian oil and the cessation of fuel imports from Russia have led to profound changes in the energy security system of EU countries in terms of crude oil and refined fuel supplies.
- The focal point of the energy security system in the region is based on ensuring the capability to receive almost the entire volume of fuels and raw materials needed in Poland and neighbouring countries from maritime routes. For this reason, the role and significance of the maritime raw material and product terminals managed by PERN have become crucial for ensuring the reliability of supplies. On the other hand, the role of the land transport route from the East has become marginal.
- The investment program implemented in the years 2013-2023 aimed to strengthen PERN's capacity to ensure energy security and to adapt the company to new challenges and threats arising from Russia's military aggression in Ukraine. There is a deep justification for the continuation of the ongoing programmes both from the perspective of the projected increase in demand for fuels, but also in view of Poland's political interest, NATO, and the European Union.
- Since 2013, GK PERN has implemented a number of investments. It increased the capacity of oil storage tanks to 4.1 million cubic meters and to 2.65 million cubic meters for petroleum products. The company manages a pipeline network of approximately 2.6 thousand kilometers, including the Polish section of the 'Friendship' oil pipeline. Naftoport and the

marine product terminal, both managed by PERN. This ensures coverage of domestic demand and a significant portion of the needs of East German refineries.

- The storage capacity for crude oil has been increased by putting into operation 13 new tanks with a total capacity of approximately 1 million cubic meters. Two of them (each with a capacity of 100,000 cubic meters) were built in the Gdańsk Base in 2020. On the other hand, 11 warehouses were put into operation at the Gdańsk Oil Terminal – 6 in 2016 with a capacity of 62,500 cubic meters each, and another 5 warehouses in 2020 and 2021 – increasing the capacity to 765,000 cubic meters.
- PERN has built new product warehouses. In the last seven years, 28 fuel storage tanks with a total capacity of 830,000 cubic meters have been put into operation. New tanks have been put into use at the following bases: Koluszki, Nowa Wieś Wielka, Rejowiec, Dębogórze, Boronów, Emilianów and Małaszewicze.
- PERN carries out activities for the energy security of Poland, Central Europe, including the Federal Republic of Germany. Currently, the company provides at least 75% of the import demand for crude oil for two East German refineries. If the receiving capabilities of the port in Rostock and the Rostock-Schwedt pipeline are expanded, then the significance of PERN in ensuring supplies will be reduced to approximately 50% of the import needs of the Leuna and Schwedt refineries.
- It should be emphasized that PERN's role is paramount in ensuring the energy security of the eastern states of the FRG, including the most important one in the German state, the capital agglomeration of Berlin. The Polish company, servicing two Polish and two German refineries, plays a key role in ensuring energy security in the production of liquid fuels in the Central European region.
- The increasing number of allied forces, including American forces, on the eastern flank requires appropriate logistical and fuel security during peacetime, crisis, and potential armed conflict. The pace of adaptation of logistics and fuel to new security environment challenges depends on the level of civil-military cooperation.
- The expansion of fuel storage and transportation capacity, resulting in the construction of 28 new fuel tanks throughout Poland, increasing the capacity to approximately 830,000

cubic meters. On the other hand, the construction of the Boronów-Trzebinia product pipeline not only improves the energy security of the southern part of Poland but also brings PERN closer to implementing the plan to extend the key NATO pipeline system to Poland. The pipeline allows replacing railway transport, representing the equivalent of over 25,000 fuel tankers annually.

- The pipeline investment by PERN should be treated as part of a future NATO investment, serving as the foundation of fuel logistics for allied forces on the eastern flank. Decisions regarding potential expansion are made through consultations among NATO members at the international level.
- PERN's participation in the construction and operational servicing of the future domestic section of the NPS will strengthen the company's capabilities in ensuring the military security of Poland and the eastern flank of NATO. GK PERN is developing its competencies in the field of NATO infrastructure maintenance – Naftoserwis, subsidiary has been regularly conducting inspections of NATO pipeline infrastructure in Belgium for several years.
- PERN is working on updating its strategy in the perspective of development until 2050. The prepared document is to be based, among other things, on long-term forecasts regarding the consumption of crude oil and fuels, taking into account the challenges related to the requirements of the Green Deal and the upcoming transformation of the fuel sector. PERN wants to follow the ongoing market changes related to the energy transformation and react to them flexibly.
- There is a high probability that there will be a medium-term demand for imported green hydrogen in the form of its derivatives – green ammonia or methanol. The centres of demand will be chemical plants such as Police, Włocławek, Puławy, Kędzierzyn-Koźle, Tarnów, as well as petrochemical plants in Płock and Gdańsk connected to the transmission infrastructure of PERN.
- PERN, the owner of maritime receiving infrastructure (raw material and product terminals) and with extensive experience in maritime operations, is a company possessing the necessary competencies to develop large-scale imports of alternative fuels for the Polish market.



Photo author: Malcolm Fife

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