

Development of Information on Poland's Energy Policies and Strategies in the Context of Geothermal Energy

Activity 4. Strategic cooperation and future planning

Author: Grzegorz Burek

Kraków, 2025

The report was prepared as part of the Project “Geothermal Synergy: Knowledge Exchange Iceland-Poland” (GeoSynergy) co-financed by the Financial Mechanism of the European Economic Area for 2014-2021. Programme “Environment, Energy and Climate Change”, Programme Area Energy

Agreement 1/UoD/FWD/MKiŚ/20234 of 19/12/2024 between the Ministry of Climate and Energy and IGSMiE PAN

Project Partners:



Programme Operator:



Author: Grzegorz Burek

More about the Project: keygeothermal.pl/geosynergy

February, 2025

Together we work for a **green**, **competitive** and **inclusive** Europe

Table of Contents

1. Introduction	4
2. Renewable Energy Directive III (RED III)	5
3. National Energy and Climate Plan (NECP)	6
a. Geothermal Energy in Strategic NECP Objectives for District Heating	6
b. Geothermal Energy’s Potential in the Transformaiton of Heating Network.....	6
c. Geothermal Energy as a Key Element in the Development of Low-Emission Transition Areas.....	6
d. Geothermal Energy as an Example of Primary Energy.....	7
e. Geothermal Energy as a Key Element of the Energy Transition toward a Climate-Neutral Economy	7
4. "Environmental Impact Forecast of the NEXP Project untill 2030"	8
a. Geothermal Energy in the Environmental Impact Forecast	8
b. Heating Networks in the Environmental Impact Forecast.....	9
5. Multiannual Program for the Development of Geothermal Resources in Poland	10
6. Programs Financing the Development of Geothermal Projects in Poland	11
a. Priority Program of the National Fund for Environmental Protection and Water Management (NFOŚiGW) – “Accessing Thermal Waters in Poland”	11
b. Priority Program of the National Fund for Environmental Protection and Water Management (NFOŚiGW) – “Polish Geothermal Plus”	12
c. Priority Program of National Found for Environemntal Protection and Water Management – “Energy Plus”.....	12
d. Priority Program of the National Fund for Environmental Protection and Water Management (NFOŚiGW) „OZE - źródło ciepła dla ciepłownictwa”	13
a. Geothermal Energy in the Context of District Heating.....	14
b. Geothermal Energy in the Context of Hybrid Systems	14
c. Geothermal Energy as a Factor in Building Energy Security.....	15
a. Geothermal Energy in the Renewable Energy Sources Act.....	17
b. Geothermal Energy in the Energy Law	17
10. Summary	18

1. Introduction

Poland, possessing significant geothermal potential, is progressively developing legal and regulatory frameworks aimed at supporting the exploitation of Earth's heat. A key element of this policy is the establishment of clear regulations that ensure both efficient and sustainable utilization of geothermal resources.

The primary regulations concerning geothermal energy are contained in the Geological and Mining Law of June 9, 2011 (consolidated text: Journal of Laws of 2023, item 1687), which defines thermal waters as underground waters with a temperature of at least 20°C at the point of extraction. This classification is crucial for identifying geothermal resources and the procedures related to their exploration, recognition, and exploitation. The Act specifies requirements for conducting geological work, preparing documentation, and obtaining the necessary concessions, ensuring effective oversight of geothermal resource utilization and sustainable development.

Additionally, the Regulation of the Minister of Energy of May 18, 2017, concerning the detailed scope of the obligation and technical conditions for purchasing heat from renewable energy sources and conditions for connecting installations to the network (Journal of Laws of 2017, item 1084), sets out the principles for integrating geothermal heat sources into heating systems. This regulation mandates the purchase of heat from renewable energy sources by energy companies, provided that specific technical and economic criteria are met, and it also regulates the process of connecting geothermal installations to heating networks.

This document provides a comprehensive analysis of geothermal development policy in Poland, based on current legal provisions and taking into account technical, environmental, and economic aspects that impact the future of the geothermal sector. The aim is to illustrate the role of geothermal energy in the national energy mix and identify barriers and opportunities for its development.

2. Renewable Energy Directive III (RED III)

The Renewable Energy Directive III is the latest update to EU regulations aimed at promoting renewable energy and reducing greenhouse gas emissions across the European Union. The RED III directive emphasizes increasing the share of renewable energy sources (RES) in the heating sector. According to its provisions, EU member states are required to increase the share of RES in heating annually by a specified percentage:

- **Until 2026:** an annual increase of **0.8 percentage points**
- **From 2026 to 2030:** an annual increase of **1.1 percentage points**.

In the case of Poland, due to the specificity of the national heating sector and existing emissions reduction challenges, the target has been set at **0.5 percentage points per year**.

Regarding geothermal energy, RED III does not explicitly refer to this energy source but promotes an overall increase in the share of RES in heating, thereby creating a legal framework conducive to the development of various renewable technologies, including geothermal energy. The use of geothermal energy can thus play a significant role in achieving the set targets within the heating sector.

It is also worth noting that RED III introduces mechanisms aimed at simplifying and accelerating administrative procedures for RES investments. Member states are required to designate special accelerated development zones for renewable energy, where project approval processes will be more efficient. In the context of geothermal energy, these measures could help reduce administrative barriers in planning and implementing geothermal projects, expedite permitting for drilling and heating infrastructure construction, and lower operational costs associated with administrative procedures.

3. National Energy and Climate Plan (NECP)

This is a key strategic document prepared by each Member State of the European Union as part of implementing the EU's energy and climate policy. It outlines the national framework for action in the areas of energy and climate for the period 2021–2030 and serves as the basis for achieving EU objectives related to reducing greenhouse gas emissions, developing renewable energy sources, and improving energy efficiency. Poland submitted its draft NECP update in 2023, which incorporates new targets arising, among other things, from the RED III directive and the “Fit for 55” package. We are now at a critical consultation stage that may define the role of geothermal energy in Poland's energy transition. Although final conclusions concerning geothermal energy will be formulated following a full analysis of the updated NECP draft and the accompanying environmental impact assessment, potential directions of change can already be indicated.

a. Geothermal Energy in Strategic NECP Objectives for District Heating

In the draft update of the National Energy and Climate Plan (aNECP), geothermal energy has been identified as one of the key heat sources, alongside other renewable energy technologies (RES) and low-emission solutions such as heat pumps, electrode boilers, waste heat, and thermal waste conversion. This approach aims to diversify heat energy sources and enhance national energy security.

b. Geothermal Energy's Potential in the Transformation of Heating Network

The aNECP document underscores the crucial role of geothermal energy in the modernization and transformation of district heating systems. In particular, it emphasizes the necessity of creating smart heating networks capable of integrating various renewable energy sources, including geothermal installations. The planned infrastructure modernization envisions the development of networks adapted to operate at lower temperatures, thereby facilitating the efficient use of geothermal energy.

According to the draft aNECP:

„Promoting smart heating networks that enable the integration of renewable energy sources, heat storage, and improved energy efficiency. This includes modernizing transmission and distribution infrastructure.” (Source: aNECP Draft, p. 108)

With this approach, geothermal energy has the potential to become an integral part of modern district heating systems, contributing to the reduction of greenhouse gas emissions and improving energy efficiency.

c. Geothermal Energy as a Key Element in the Development of Low-Emission Transition Areas

In the Environmental Impact Forecast of the NECP Project until 2030, geothermal energy is highlighted as one of the key tools supporting the low-emission transition in Poland. The document points to the need for developing renewable energy generation technologies, including geothermal energy, as a means of achieving the country's climate and energy objectives.

“Development in areas conducive to low-emission transition (...) In order to address the challenges of the climate and energy transition, particularly important development areas include, among others: (...) energy generation technologies from renewable sources, including bioenergy, wind power, photovoltaics, and geothermal energy.” (Source: Environmental Impact Forecast, p. 15)

The use of geothermal energy in district heating systems not only supports the low-emission transition, but also creates opportunities for local communities by increasing energy independence and generating new jobs in the RES sector.

d. Geothermal Energy as an Example of Primary Energy

Primary energy, according to the accepted definition, encompasses energy resources found in nature in their natural form, which have not yet undergone any processing. This may include energy contained in fossil fuels such as coal, crude oil, or natural gas, as well as energy sourced from renewables directly available in the environment, such as solar, wind, water, or biomass. In the National Energy and Climate Plan, geothermal energy is mentioned as an example within the definition of primary energy. The provided definition of primary energy indicates that it is energy contained in **primary energy carriers** – both those derived from fossil fuels and those obtained directly from the natural environment. Including geothermal energy in the definition of primary energy represents a formal acknowledgment of geothermal energy as an equivalent source alongside other conventional and renewable energy sources. It has been listed as primary energy alongside technologies such as hydropower, wind power, solar energy, and biomass. Incorporating geothermal energy into the category of primary energies places it on par with other widely recognized energy sources, both renewable (solar, wind, water, biomass) and non-renewable (fossil fuels). This is significant from the standpoint of energy policy and legal regulations, which often define specific support or requirements for certain types of primary energy.

e. Geothermal Energy as a Key Element of the Energy Transition toward a Climate-Neutral Economy

Within Poland’s energy policies and strategies, geothermal energy has been explicitly highlighted as one of the key energy sources supporting the transition of the energy sector toward climate neutrality. Strategic documents emphasize that a major objective of the national energy and climate policy is not only to ensure energy security but also to reduce the adverse environmental and climate impacts of the energy sector. These objectives are reflected, among other things, in the assumptions concerning the development of geothermal energy as a stable, low-emission source of energy that aligns with the strategy of achieving climate neutrality by 2050 (p. 127, objective 5.1.2: “Development in areas conducive to transformation toward a climate-neutral economy”). Geothermal energy, as one of the renewable energy sources with significant potential in Poland, can play a critical role in achieving the goal of climate neutrality by 2050. Given the possibility of long-term exploitation of geothermal resources and the stable nature of this technology, it fits into the long-term sustainable development strategies of the energy sector.

4. "Environmental Impact Forecast of the NEXP Project until 2030"

a. Geothermal Energy in the Environmental Impact Forecast

As mentioned in the previous chapter, in developing the National Energy and Climate Plan (NECP) for 2030, geothermal energy has been recognized as one of the key renewable energy sources supporting Poland's energy and climate policy objectives. The environmental impact forecast for this plan plays a crucial role in assessing the potential effects of the proposed measures on the natural environment; correspondingly, this document gives significant attention to the development of the geothermal sector. It analyzes both the benefits brought by the sector's growth and the potential environmental hazards associated with its exploitation. Among the most important benefits, the substantial impact of geothermal energy on reducing greenhouse gas emissions is emphasized, directly contributing to Poland's decarbonization goals. Replacing traditional heat sources with geothermal installations also improves air quality by limiting the emission of harmful particulates and other pollutants. Furthermore, geothermal energy enhances the country's energy security, providing a stable, local energy source that is independent of weather conditions and fuel imports.

However, the forecast also points to a series of risks associated with geothermal development. The most significant among these involve the possibility of contaminating groundwater and surface water during drilling and the operation of wells. Inadequate management of geothermal waters, especially those with high mineralization, can lead to degradation of water and soil environments. Another challenge is the risk of inducing microseismic events, particularly when employing advanced technologies such as Enhanced Geothermal Systems (EGS), which may destabilize geological structures. Moreover, the expansion of geothermal infrastructure can affect local ecosystems, particularly when projects are located near protected areas.

To minimize these risks, the forecast recommends a range of preventive measures. Implementing modern drilling technologies is crucial to reduce the risk of contaminating water and soil environments. Continuous environmental monitoring, including tracking water quality, seismic activity, and the condition of local ecosystems, is also advised. Effective geothermal water management—by reinjecting it into the reservoir or using neutralization systems before discharge—constitutes another key element. When planning geothermal investments, it is essential to avoid drilling operations near ecologically sensitive areas and to take local environmental conditions into account.

In summary, geothermal energy has the potential to become one of the pillars of Poland's energy transition toward climate neutrality. The environmental impact forecast confirms that, given appropriate environmental safeguards, the growth of the geothermal sector can bring numerous benefits, both in terms of emission reductions and enhancing the country's energy security. Proper risk management and implementation of recommended protective measures will enable the sustainable development of this technology, minimizing its environmental impact and supporting the achievement of Poland's strategic energy and climate objectives.

b. Heating Networks in the Environmental Impact Forecast

Within the Environmental Impact Forecast of the NECP Project until 2030, a detailed analysis was conducted on how the development and modernization of district heating infrastructure affect the environment. The document focuses on both the short- and long-term impacts associated with developing heating networks and their integration with renewable energy sources, including geothermal energy.

The analysis shows that, although the construction and modernization phase of district heating networks is essential for transforming the heating sector, it involves certain negative environmental impacts. The most significant of these concern disturbances to the natural environment during earthworks, emissions from construction machinery, and the potential fragmentation of natural habitats. Such impacts on local ecosystems are particularly relevant during the implementation of large-scale infrastructure projects, such as building new transmission networks or expanding heating nodes. When geothermal energy is integrated with district heating networks, the impact on the environment also arises from geothermal drilling activities, which can cause temporary disruptions to local ecosystems. Despite these challenges, the forecast indicates that, in the long run, the modernization and development of district heating networks will have a clearly positive effect on the environment. The integration of renewable energy sources, including geothermal energy, into smart heating networks is a key element in this transformation, enabling significant improvements in energy efficiency and reduced transmission losses—directly lowering primary energy consumption.

Incorporating geothermal energy into district heating networks will also substantially reduce air pollutant emissions, including carbon dioxide, particulate matter, and nitrogen oxides, which are currently produced by traditional heat sources based on fossil fuels. This will not only mitigate the sector's adverse impact on air quality but also help meet national climate goals related to reducing greenhouse gas emissions.

The forecast likewise highlights the importance of intelligent management systems for district heating networks, which enable the optimization of energy consumption and the adjustment of heat supply to actual demand. Such systems, in combination with geothermal energy as a stable and predictable energy source, will enhance the flexibility and reliability of heat deliveries, thereby contributing to improved energy security at both local and national levels.

In conclusion, while developing heating infrastructure entails some temporary negative environmental impacts, the document's authors note that the long-term benefits arising from network modernization and geothermal integration significantly outweigh these drawbacks. Lower emissions, better energy efficiency, and reduced transmission losses are critical factors supporting the country's climate and environmental objectives. Ultimately, implementing these solutions will lead to a more sustainable and efficient district heating system in Poland, aligning with the country's long-term energy transition strategy.

5. Multiannual Program for the Development of Geothermal Resources in Poland

The Multiannual Program for the Development of Geothermal Resources in Poland, prepared under the auspices of the Ministry of Climate and Environment, is a comprehensive strategic document outlining the directions and objectives for the development of the geothermal sector through 2040. The program's primary goal is to increase the share of geothermal energy in the national energy mix while ensuring the sustainable development of geothermal technologies and minimizing environmental impact. The program also aims to support local communities by developing geothermal infrastructure and creating new jobs.

Program Objectives and Assumptions:

- Achieving a total geothermal capacity of approximately 290 MW by 2040.
- Drilling 78 exploratory wells by 2040, of which 34 are to be completed by 2027, forming the basis for the construction of 78 geothermal installations.
- Generating around 9,949.6 TJ of thermal energy by 2040, including 3,043.2 TJ by 2027.

Costs and Financing:

- The total cost of the program is estimated at PLN 3,004 million, of which PLN 1,315 million is designated for activities to be carried out by 2027.
- The costs cover drilling operations, the development of surface infrastructure, and the integration of new sources with existing district heating networks.

Investments in Geothermal Technologies:

- Development of low- and medium-temperature geothermal energy under the National Fund for Environmental Protection and Water Management (NFOŚiGW) programs "Accessing Geothermal Waters in Poland" and "Polish Geothermal Plus," with a budget of PLN 3,127.4 million for the years 2022–2040.
- Investments in high-temperature geothermal energy, including HDR and EGS technologies as well as binary systems, with estimated costs of PLN 46 million for binary systems and PLN 50 million for HDR and EGS technologies.
- Advancement of heat storage technologies in rock formations, with a budget of PLN 1,497.4 million and the planned launch of pilot installations in 2024.

Risk Management and Investment Support: The program provides for the implementation of a risk insurance system for geothermal projects, particularly those requiring the drilling of geothermal wells. The purpose of this mechanism is to reduce investment risk and encourage investors to participate in developing the geothermal sector.

This program constitutes an important element of Poland's energy policy by supporting the decarbonization of the heating sector, the development of renewable energy sources, and the strengthening of local economies through the utilization of geothermal resources.

6. Programs Financing the Development of Geothermal Projects in Poland

The growth of the geothermal sector in Poland plays a vital role in fulfilling the country's energy and climate policy objectives, especially in the context of the energy transition and the decarbonization of the economy. As a stable and renewable energy source, geothermal energy offers significant environmental and economic benefits, contributing to improved air quality, reduced greenhouse gas emissions, and increased energy security. However, the implementation of geothermal projects involves high investment costs, particularly during the exploration and identification of geothermal reserves as well as the construction of technical infrastructure. Consequently, dedicated financial programs that provide investors with access to grants, preferential loans, or other forms of support have become an essential factor fostering the development of geothermal energy in Poland.

The National Fund for Environmental Protection and Water Management (NFOŚiGW) plays a key role in financing projects related to the development of geothermal energy. Through its activities, the fund has launched several priority programs aimed at supporting both geological research and the exploration of thermal water deposits, as well as the construction and modernization of geothermal installations for heat and electricity production. These programs are designed to meet the needs of various investor groups—from local governments to private businesses—facilitating projects of different scales and purposes. Each of these programs offers or has offered various forms of financial support—from non-repayable grants to preferential loans—while also specifying particular participation conditions, eligibility criteria, and a scope of activities that can be financed. The programs are at different stages of implementation; for illustrative purposes, the most recent initiatives are presented here.

- a. Priority Program of the National Fund for Environmental Protection and Water Management (NFOŚiGW) – “Accessing Thermal Waters in Poland”
 - CALL FOR APPLICATIONS OPEN – LOAN-BASED FINANCING

The National Fund for Environmental Protection and Water Management (NFOŚiGW) is running a dedicated support program for geothermal energy entitled “Accessing Thermal Waters in Poland.” The program focuses on financing activities related to the exploration and identification of thermal water deposits, with the goal of making these resources available for further energy-related use.

Funding is provided in the form of a loan covering up to 100% of eligible costs to cover expenses exceeding the unit costs designated for grants. The call for applications runs from May 2, 2023, through November 30, 2025. Eligible beneficiaries include local government units or their associations that have previously signed a grant agreement with NFOŚiGW for the same project. The total allocation of funds for this purpose amounts to PLN 50 million. The program's objective is to increase the availability of geothermal resources in Poland, enabling investments that foster the development of geothermal energy and the efficient use of thermal waters within the energy sector.

b. Priority Program of the National Fund for Environmental Protection and Water Management (NFOŚiGW) – “Polish Geothermal Plus”

- APPLICATION PERIOD CLOSED – FUNDS CURRENTLY BEING DISBURSED

The “Polish Geothermal Plus” program, launched by the National Fund for Environmental Protection and Water Management (NFOŚiGW), was dedicated to supporting geothermal energy development in Poland with a budget of PLN 600 million—divided equally into PLN 300 million for grants and PLN 300 million for loans. Applications were accepted on a continuous basis and evaluated as they were submitted.

The program was aimed exclusively at entrepreneurs and intended to facilitate the development and increased use of geothermal resources in Poland. The funding covered the construction, expansion, or modernization of geothermal heating plants, combined heat and power plants, and power plants, as well as the drilling or reconstruction of geothermal wells (excluding the initial exploratory well). Optional support was also available for modernizing district heating networks, improving energy efficiency, or installing renewable energy solutions. Grants covered up to 40% of eligible costs (up to 50% for projects utilizing ORC technology), while loans could finance up to 100% of costs, with preferential interest rates and a repayment period of up to 20 years. The program was implemented from 2019 to 2025, with the signing of agreements concluding in 2023, and the disbursement of funds scheduled to continue through the end of 2025.

Currently, there is no confirmed information regarding continuation of the program after 2025; however, according to the program’s assumptions, disbursement of the contracted funds—which will help further develop geothermal energy in Poland—should continue during this period.

c. Priority Program of National Found for Environmental Protection and Water Management – “Energy Plus”

- APPLICATION PERIOD CLOSED ON DECEMBER 13, 2024

The “Energy Plus” priority program, implemented by the National Fund for Environmental Protection and Water Management (NFOŚiGW), provided substantial support for projects involving the utilization of geothermal resources for energy. A total of four calls for proposals were held: the first in 2019, and the last extending until December 13, 2024, covering initiatives related to category 7.5.6—Energy Use of Geothermal Resources, which include:

- Construction of new facilities, expansion, or modernization of existing ones
- Modernization or expansion of existing energy sources by integrating them with geothermal installations
- Drilling or reconstruction of geothermal wells, subject to the following conditions:
- The costs of drilling are eligible based on specified maximum rates, depending on the depth of the well
- Drilling of exploratory wells is not eligible

Support was provided in the form of grants and preferential loans, with partial loan forgiveness available. The program also stipulated specific requirements regarding the applicant’s own

contribution. Grants could cover up to 50% of eligible costs for projects employing ORC technology to generate electricity from geothermal energy. Loans could finance up to 85% of costs, ranging from PLN 1 million to PLN 300 million, at an interest rate of WIBOR 3M + 50 basis points (minimum 2%), with the option to forgive up to 10% of the loan (capped at PLN 1 million). For investments conducted under the “project finance” model, an own contribution of at least 15% of eligible costs was required.

- d. Priority Program of the National Fund for Environmental Protection and Water Management (NFOŚiGW) – “RES: A Heat Source for District Heating”
 - APPLICATION PERIOD CLOSED IN 2024 – APPLICATIONS UNDER REVIEW

In addition to the “Polish Geothermal Plus” program, geothermal energy was also supported under the priority program “RES: A Heat Source for District Heating,” carried out by the National Fund for Environmental Protection and Water Management (NFOŚiGW). Although the application period ended in 2024, the topic remains relevant, particularly because the program focused on developing renewable energy installations in the district heating sector, including geothermal energy. The program’s objective was to support investments in generating heat from renewable sources, encompassing geothermal energy, heat pumps, and solar collectors. Projects eligible for support included the construction or modernization of heat sources with a capacity of at least 2 MWt, on the condition that at least 70% of the useful heat had to be supplied to a public district heating network.

The program allowed funding not only for the heat source itself but also for supplemental components such as energy storage facilities or connections to the district heating network. Financial support was available in the form of grants and/or loans, with an allocation of PLN 1.43 billion for grants and PLN 570 million for loans.

7. Geothermal Energy in Poland's Energy Policy until 2040 (PEP2040)

Poland's Energy Policy until 2040 (PEP2040) is a key strategic document outlining the directions for the development of the Polish energy sector. The document underscores the necessity of the country's energy transition by increasing the share of renewable energy sources (RES) in the energy mix, particularly in the heating and electricity sectors. Geothermal energy is highlighted as one of the crucial renewable energy sources that can play a significant role in decarbonizing Poland's economy and enhancing the nation's energy security.

a. Geothermal Energy in the Context of District Heating

One of the priorities set out in PEP2040 is the development of district heating systems based on renewable energy sources, ultimately emphasizing geothermal energy. The policy calls for expanding and modernizing district heating networks to integrate renewable sources (such as geothermal) with existing systems. It also involves the implementation of intelligent district heating networks, facilitating dynamic management of heat transmission, optimization of energy consumption, and enhancement of operational efficiency. Integrating geothermal energy into district heating networks is also expected to help reduce transmission losses and improve the flexibility of heating systems.

Under this policy, coal is to be gradually phased out from individual heat sources in urban areas by 2030 and in rural areas by 2040. The goal is to increase the number of households connected to district heating networks by 1.5 million by 2030. By that same year, at least 85% of district heating systems with a contracted capacity above 5 MW are to meet the criteria of an energy-efficient district heating system. Additionally, by 2030, renewable energy sources should account for at least 28% of the heating and cooling sector

b. Geothermal Energy in the Context of Hybrid Systems

PEP2040 also promotes the development of hybrid systems that combine geothermal energy with other renewable energy technologies, such as heat pumps or solar installations. Integrating various energy sources enhances the energy efficiency of heating systems and ensures greater stability in energy supply. Hybrid systems additionally allow for optimizing operating costs and making better use of local energy resources.

In the context of hybrid systems, geothermal energy serves as a stable baseload source, delivering heat regardless of weather conditions, while technologies such as heat pumps or solar collectors can supplement the system during periods of increased demand or favorable weather. This approach makes it possible to increase the share of renewable energy in the heating mix and minimize the use of fossil fuels.

c. Geothermal Energy as a Factor in Building Energy Security

Poland's Energy Policy until 2040 views the development of geothermal energy as a significant factor in enhancing the country's energy security. Diversifying energy sources—particularly through the use of local geothermal resources—reduces reliance on imported fossil fuels and limits the energy system's vulnerability to fluctuations in international commodity prices.

Because geothermal energy is independent of weather conditions, it offers exceptional stability of supply, which is especially important as decentralized energy systems develop and in strengthening resilience to potential disruptions in energy deliveries. Consequently, PEP2040 recognizes geothermal energy development as one of the tools supporting the creation of a secure and sustainable energy system in Poland.

8. Heating Sector Strategy until 2030 with a 2040 Outlook

The Heating Sector Strategy until 2030 with a 2040 Outlook is intended to be a key document charting the transformation of Poland's heating sector toward low-emission and sustainable development. It is "intended to be" because work on this document has not yet been completed. The Strategy aims to operationalize the assumptions set out in Poland's Energy Policy until 2040 and the National Energy and Climate Plan (NECP) for 2021–2030. One of its main objectives is to increase the share of renewable energy sources (RES) in heat production. However, the final version of this document has not yet been published.

The process of developing the Heating Sector Strategy until 2030 with a 2040 Outlook began in May 2022 with the launch of public consultations aimed at gathering opinions and comments from a broad range of stakeholders, including representatives of the heating industry, environmental organizations, and local government units. Despite initial plans to have the Strategy adopted by the Council of Ministers by the end of 2024, as of February 20, 2025, there is no official information confirming its formal approval.

Although the publication of the final document has been delayed, the directions set forth in the draft Strategy clearly indicate a strong commitment to increasing the role of geothermal energy within Poland's heating sector as a key tool for transitioning to a low-emission and sustainable system.

9. Other Legal Acts Relating to Geothermal Energy

a. Geothermal Energy in the Renewable Energy Sources Act

The Renewable Energy Sources Act of February 20, 2015 (consolidated text: Journal of Laws of 2024, item 1361) regulates the principles and conditions for conducting activities involving the generation of renewable energy (including heat). It defines the mechanisms supporting the generation of renewable energy and sets out the rules for issuing guarantees of origin for energy produced from these sources. Foremost, the Act provides a definition of renewable energy sources, explicitly listing geothermal energy as one of the key sources. The Act establishes support mechanisms for the production of electricity and heat from renewable sources, including geothermal energy, and sets the terms for issuing guarantees of origin for energy generated from RES, which also encompasses geothermal energy.

b. Geothermal Energy in the Energy Law

The Energy Law Act of April 10, 1997 (consolidated text: Journal of Laws of 2024, item 266) includes provisions concerning the state's energy policy, including the rules for connecting RES installations to the energy grid and the obligations of energy companies in the heating sector. As part of the country's energy policy, the Act emphasizes the development and use of renewable energy sources, including geothermal energy, as a means of ensuring energy security and environmental protection. It also mandates taking renewable energy sources—such as geothermal energy—into account in the process of fuel and energy supply and usage, thereby promoting their rational and efficient utilization.

10. Summary

Geothermal energy is playing an increasingly significant role in Poland's energy and climate policy, serving as a key component of the transition toward a low-emission and climate-neutral economy. In the strategic documents discussed—such as the RED III Directive, the National Energy and Climate Plan (NECP), Poland's Energy Policy until 2040 (PEP2040), and the Multiannual Program for the Development of Geothermal Resources in Poland—geothermal energy is presented as a stable, renewable energy source with substantial potential in district heating, and, in the future, for electricity generation.

The RED III Directive promotes the development of renewable energy sources (RES), including geothermal energy, by setting targets to increase the share of RES in the energy mix of EU Member States and by simplifying administrative procedures for RES investments. In line with the directive, Poland has committed to an annual increase in the share of RES in district heating, creating further opportunities for geothermal development.

The National Energy and Climate Plan (NECP) recognizes geothermal energy as one of the key primary energy sources with the potential to significantly contribute to the transformation of district heating. This document highlights the value of geothermal energy in creating smart district heating networks, integrating various RES sources, and reducing greenhouse gas emissions. The Environmental Impact Forecast accompanying the NECP points to environmental benefits derived from geothermal energy—such as reduced CO₂ emissions and improved air quality—as well as risks associated with geothermal resource exploitation, including possible groundwater contamination or microseismic events.

Poland's Energy Policy until 2040 (PEP2040) identifies geothermal energy as a key element of the country's decarbonization strategy, particularly within the district heating sector. The document provides for expanding and modernizing district heating networks to integrate geothermal sources, as well as for developing hybrid systems that combine geothermal energy with other RES technologies. PEP2040 also regards geothermal energy as a tool for strengthening energy security through source diversification and reduced dependence on imported fossil fuels.

The Multiannual Program for the Development of Geothermal Resources in Poland (2022–2040) envisions achieving a total geothermal capacity of 290 MW by 2040 through the construction of 78 geothermal installations based on 78 exploratory wells. The program aims to generate around 9,949.6 TJ of thermal energy by 2040, including 3,043.2 TJ by 2027. The total cost of the program is estimated at approximately PLN 3,004 million, of which PLN 1,315 million is allocated for the period up to 2027. Planned investments include low-, medium-, and high-temperature geothermal energy, heat storage in rock formations, and HDR and EGS technologies. The program also provides for a risk insurance system for geothermal projects to encourage investors and mitigate investment risk.

Geothermal development in Poland is supported by numerous financial programs of the National Fund for Environmental Protection and Water Management (NFOŚiGW), such as “Energy Plus,” “Polish Geothermal Plus,” “RES: A Heat Source for District Heating,” and “Accessing Thermal Waters in Poland.” These programs offer grants and preferential loans for the development and modernization of geothermal installations, as well as funding for research related to geothermal resource exploration.

Although the Heating Sector Strategy until 2030 with a 2040 Outlook remains unapproved, it also plans for the further integration of geothermal energy into district heating systems and the development of low-emission heat sources, thereby contributing to Poland’s climate objectives.

In summary, geothermal energy has significant potential as a stable, renewable energy source and may play a crucial role in Poland’s energy transition. Implementing strategies and programs that support the geothermal sector—while taking environmental and social considerations into account—will enable the efficient use of domestic geothermal resources, contributing to the decarbonization of the economy, improving air quality, and strengthening Poland’s energy security.