

Polish Hydrogen Strategy until 2030 with a perspective until 2040

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FORECAST

Abstract in non-specialised language

(English version)

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1. Introduction

This environmental impact assessment forecast has been developed due to the need to carry out the strategic environmental impact assessment procedure. This obligation results from national regulations and European Union law.

Within these proceedings, the compliance of a draft strategic document with environmental policy, as well as its impact on the environment, are assessed. If the assessment results confirm that the subject of the assessment may have a negative impact on the environment, proposals of solutions minimising this impact are specified. A similar step is also performed when the implementation of the assessed document will not generate adverse effects by itself, but will not use its potential to improve the level of environmental protection.

In this case, the subject of the strategic environmental impact assessment is the 'Polish Hydrogen Strategy until 2030 with a perspective until 2040' (PHS).

2. Information on the content of the assessed Strategy

PHS defines the goals and activities for the development of a low-carbon hydrogen economy in Poland. The objective of this Strategy is to create a Polish hydrogen industry and its development in order to achieve climate neutrality and maintain the competitiveness of the Polish economy. The Strategy indicates three main sectors where hydrogen can be used, i.e. power, transport and industry. In addition, the PHS indicates activities related to hydrogen production and its transport, distribution and storage, together with outlines of necessary changes in the law and financing methods.

3. Environmental protection objectives at the EU, national and regional level

The EIA predictions include an analysis of many strategic documents in which the objectives of the environmental protection policy are set. Due to the fact that the above-mentioned documents contain many different arrangements for the protection of individual components of the environment, an attempt to list the most important strategic environmental protection objectives resulting from these documents has been made for the purposes of this EIA forecast. As a result of this analysis, the following aggregated environmental goals have been formulated:

1. Maintaining and improving the comfort and quality of people's lives.
2. Counteracting soil degradation.
3. Limiting emissions of pollutants and improving or maintaining air quality levels that do not pose threat to human health and the environment.
4. Counteracting climate change and limiting its negative effects, as well as adapting to climate change.
5. Protecting acoustic conditions and reducing noise emissions.

6. Managing natural resources in a sustainable way.
7. Protecting and restoring landscape values.
8. Protecting and limiting the negative impact on monuments and material goods.
9. Developing a resource-efficient, low-emission and low-waste economy.

4. Analysis of the compliance of the assessed Strategy with the environmental protection policy

As a result of the conducted studies, it was found that the assessed Strategy complies with the policy of environmental protection and sustainable development. Its strategic goals will support the achievement of environmental protection goals, in particular with regard to the increase in the use of electricity from renewable energy sources (RES) by specific economic sectors (such as the transport sector, various industries and heating - including building heating) in order to minimise the dependence on fossil fuels that contribute to greenhouse gas emissions to the environment. The assessed Strategy takes adequately into account aspects related to the reduction of pollutant emissions to the atmosphere, the protection of energy resources, and the development of a low-emission and resource-efficient economy.

5. Analysis of environmental conditions

The EIA predictions include the most important (from the point of view of this Strategy) environmental conditions. The following main problematic aspects related to environmental protection have been identified:

1. Insufficient quality of air (especially in cities) due to significant anthropogenic pollution with atmospheric particulate matter (PM_{2.5} and PM₁₀), tropospheric ozone, nitrogen oxides and benzo(a)pyrene.
2. Insufficient share of renewable energy sources in the overall energy generation balance.
3. Too high energy consumption of the economy and greenhouse gas emissions.
4. Exceedances of environmental noise limits in cities.
5. Progressive climate change (visible, i.e., in the intensification of extreme weather events), thus adaptation to climate change being too slow.
6. Growing investment pressure related to the progressive increase in the construction of residential, industrial and communication buildings.
7. Unsatisfactory condition of surface waters.
8. Threatened potential of ecosystem services.

The identification of the above-mentioned problems has become the basis for the development (at the European Union, national and regional level) of a number of strategic actions to improve the condition of the environment. They were followed by financial support mechanisms. The Strategy under review is one of these mechanisms and it can significantly contribute to the reduction of environmental problems related to air protection and renewable energy.

6. Analysis and assessment of significant environmental impacts

The level of detail of the impact forecast is adequate to the findings of the evaluated Strategy: if the impact is general, it is not possible to perform a detailed assessment. Such an assessment can only generally consider the benefits and threats resulting from the implementation of the strategic document or the withdrawal from its implementation. These considerations should allow for the formulation of recommendations on the possibility of reducing the possible negative impact on the environment and in terms of possible support for the implementation of strategic environmental protection goals. The Strategy does not determine the types and locations of investments that will arise as a result of its implementation, thus the assessment of environmental impacts and the resulting recommendations cannot be complete and precise.

Taking into account the above-mentioned conditions, an environmental impact analysis of the implementation of the findings of the PHS has been carried out. No significant negative impacts on the environment are considered likely. On the other hand, the possibility of positive impacts has been identified, in particular on such components as: climate and atmospheric air, surface and underground waters, and nature and raw materials. A positive impact on the landscape and cultural assets is also possible. The only negative effect that could result from the implementation of PHS-related activities is the impact and limitations related to the development of technologies based on conventional fuels (their acquisition, extraction and processing have a negative impact on many components of the environment). Additionally, it should be noted that possible negative effects would be mainly caused by investment activities related to the construction of infrastructure for, i.a., the distribution and storage of hydrogen. Thus, negative impact would be possible at the stage of implementation of these activities as there would be a risk of water pollution in the event of an unplanned situation. However, this impact would be temporary and would, in most cases, require a failure of construction equipment to occur. The risk is going to be limited to the minimum due to the fact that the activities in question will have to meet environmental protection criteria, including, i.a., the obligation to use fully functional and regularly serviced construction equipment. A possible additional negative impact may also occur at the stage of direct implementation of the project (due to the noise, dust and land occupation). Such effects can be eliminated or effectively minimised (through the typical best practices for renovation, construction, and geological works). The above-mentioned impacts are short-term (limited to the period of main construction works) and reversible, as well as possible to eliminate or limit significantly (through proper planning and organisation of the construction works).

7. Environmental impact in the case of a withdrawal from the implementation of the assessed Strategy

As already stated, the PHS can significantly contribute to the implementation of the environmental policy. A withdrawal from the implementation of the Strategy will be a waste of the opportunity to strengthen and improve the environmental protection policy. Thus, the

implementation of the analysed Strategy will determine the actual will to achieve environmental goals.

8. Proposal of alternative solutions

Due to the fact that the evaluated document is a strategic one and it does not indicate specific investment projects, but only strategic objectives and actions for the development of a low-carbon hydrogen economy in Poland, a detailed and rational environmental analysis of alternative options is virtually impossible. However, the objective is thus set, which relates strictly to the introduction of a low-carbon hydrogen economy as an energy source, also defines alternative measures that should be accepted as possible and analysed only in terms of the production, distribution and use of hydrogen. This approach does not allow to identify concretely and precisely alternative actions to its strategic objectives using alternative (to hydrogen) energy sources as this would be contrary to the objective of the PHS. It should also be noted that for this reason the Strategy does not present alternative proposals either. In fact, an analysis of alternative options will be possible if one or more technologies of producing hydrogen have been developed on the basis of the PHS. Actions in this field will be undertaken at the stage of development of investment projects, feasibility studies and administrative proceedings, under which an assessment of the impact of the project on the environment, the objectives and subject of protection of the statutory forms of nature conservation (including Natura 2000 areas) or an analysis of the impact on environmental objectives in the field of water protection will be carried out. At this stage knowledge on the technology to be used, the scope and scale of the project as well as its emissions will be available. Finally, it should be pointed out that, in relation to other strategic documents in the field of energy, and in particular to the Energy Policy of Poland until 2040, the PHS is a development document focused on one of the sources of low-emission energy, i.e. hydrogen. Therefore, consideration of alternative options should be limited only to the objectives to be achieved through the Strategy implementation. Comparing other sources of energy to that derived from hydrogen goes essentially beyond the purpose and object of the PHS, and, moreover, another strategic document was intended to do, i.e. the above-mentioned Energy Policy of Poland until 2040.

The proposed findings of the document being evaluated will not lead to a negative environmental impact, because the PHS does not create a policy that could generate such impacts. On the other hand, the Strategy outlines conditions to ensure that the projects will be implemented in compliance with binding environmental regulations. Therefore, there is no justification for proposing alternative ways to achieve strategic goals from a formal and ecological point of view. In the case discussed, the worst option would be to withdraw from actions provided for in the Strategy.

However, the impacts generated by individual investment projects are a different matter - in those cases, a relevant analysis in order to develop the most rational and feasible option can be carried out only at the stage of design and administrative proceedings.

9. Measures to prevent and reduce the negative impact on the environment

The provisions of the PHS do not generate a negative impact on the environment, but create a framework for conducting activities resulting in a positive impact. Thus, there is no need to formulate a catalogue of necessary environmental protection recommendations addressed directly to the Strategy under review.

On the basis of the performed analyses of the condition of the environment, its problems and challenges, the most important environmental recommendations can be identified, which should be followed by the projects undertaken by investors in the directions indicated in the Strategy. Fulfilment of these recommendations will contribute to the pro-environmental character of the projects aimed at the objectives of the PHS and will minimise negative impacts on the environment and human health, or even positively affect the environment. It must be strongly emphasised, however, that the character of the PHS is general and therefore the recommendations relating to the investment projects will also remain general - being a starting point for further analytical work conducted at the stage of design and administrative proceedings. These recommendations are limited to elementary rules of environmental protection resulting from the law.

Formal and legal recommendations:

- assessment of compliance with environmental requirements at the stage of a project's design, implementation and operation, and after its completion;
- obtaining all legally required administrative decisions in the field of environmental protection and making relevant pre-construction notifications;
- monitoring and reporting on the use of the environment;
- applying general environmental protection principles, i.e. the principles of: precaution, prevention, high level of protection, rectification (removal of environmental damage at the source), comprehensive protection, and the 'polluter pays' principle.

Planning and strategic recommendations:

- ensuring compliance with the environmental policy set out in national, regional and local strategic documents on environmental protection;
- ensuring compliance with current spatial development plans;
- taking into account the results of strategic environmental impact assessments (conducted for documents in which strategic objectives of a given investment project are included);
- taking into account the results of analytical work carried out for the development of strategic documents in the field of environmental protection (e.g. flood hazard maps, pressure analyses, studies prepared for the purposes of spatial development plans or studies of spatial development conditions and directions of the municipality, reports on the state of the environment).

Technical and technological recommendations:

- limitation of construction works and transformation of the earth's surface to the necessary minimum; removal of the soil layer in order to protect it from contamination and to reuse it;
- protection of soil, ground surface and mineral resources;
- avoiding the conversion of natural and quasi-natural ecosystems;
- taking into account landscape protection during planning and implementing of investments;
- minimising of interference with the groundwater environment and the groundwater system;
- carrying out environmental monitoring in such a way as to allow surveillance of the key environmental aspects;
- securing the worksite against the penetration of pollutants into water and soil, including protection against leaks from equipment using environmentally hazardous substances;
- the application of solutions limiting emissions of dust, gases, radiation, noise, energy and other pollutants to the environment;
- implementation of adequate water and wastewater treatment systems;
- avoiding crossing and defragmentation of valuable natural structures, including protected areas, ecological corridors and areas of high natural value not being protected under the law;
- conducting construction works in a manner minimising the risk to groundwater and surface water;
- analysing hydrogeological conditions during designing underground hydrogen storage in order to avoid damage to groundwater that is difficult to reverse;
- management of the resulting solution (brine) without causing damage to the environment, in particular when an underground gas storage site is built using the cavern leaching method;
- the use of best available techniques, in particular where a project involves the construction or modernisation of an installation which may significantly impact the environment as a whole;
- application of solutions guaranteeing energy and raw material/material savings;
- use of zero-waste technologies, minimisation of the amount of waste generated, reusing waste, application of closed-cycle economy principles;
- in case of projects the implementation of which has a significant impact on the environment or leads to a decrease in water retention in a basin area, the application of appropriate compensating solutions;
- application of techniques and technologies ensuring the protection of the environment.

Social and health recommendations:

- informing the public about the impact of investment projects on the environment - at the stage of preparing the largest investments for execution and at the operational stage;
- minimising ecological and social conflicts related to the implementation of the project;

- reducing the size of the population exposed to the impacts of harmful factors to health (air pollution, noise) generated by the project;
- application of measures limiting emissions to the environment during construction works.

Environmental recommendations:

- conducting a nature inventory of the site before the investment;
- adjusting the timing of works to the breeding and spawning periods of mammals, birds, amphibians and fish spawning grounds, or creating substitute habitats;
- minimising disturbances to ecosystems (e.g. physical barriers in ecological corridors, fragmentation of ecosystems);
- avoiding disturbances and conversion of the Natura 2000 habitats, most at risk from EU-wide biodiversity loss: coastal habitats, wetlands and grasslands;
- preservation of landscape values in the case of projects which may cause natural and landscape conflicts (also taking into account the exposure of historical buildings);
- taking into account the need to carry out nature compensation, where justified;
- taking into account the need for pre- and post-execution monitoring for projects conflicting with the needs of species and habitats protection.

Recommendations for environmental management:

- avoiding, eliminating, minimising and compensating negative environmental impacts - in line with environmental management principles;
- identification of environmental aspects - factors that can generate negative environmental impacts;
- monitoring of environmental impacts, which will be based on the identification of the baseline condition, implementation, and impacts during operation, use and decommissioning;
- promoting the use of eco-innovation and green public procurement to reduce negative impacts on the environment.

10. Proposed methods of an analysis of the implementation of the Strategy

Due to the fact that the draft Strategy under discussion does not create an independent sectoral policy, but it is rather a specific tool of an already adopted policy (specified in other strategic documents), there is no need to create an additional extensive system for monitoring environmental aspects related to the implementation of the analysed document. The monitoring system of environmental aspects related to the implementation of the analysed PHS is supported by the monitoring system of achieved outputs and results created for the implementation of the PHS. On the other hand, the need of the development of the evaluation report summarising the implemented Strategy, which will present the most important material, financial, energy and environmental effects achieved, is indicated. Activities in the field of monitoring the environmental aspects of the PHS implementation are supported through obtaining information from the beneficiaries on the assumed and achieved environmental and

energy effects. It is important to note that the changes in the environment will not be direct indicator of the PHS implementation, but they will be the effect of these actions and, in relation to the effects of other documents' implementation, will be the result of the implementation of the whole system of strategic documents, both pro-environmental and those relating to various areas, including energy.

We recommend paying particular attention to the scope and manner of environmental monitoring during planning of the project's implementation and operation when an environmental decision or permit (i.e. the so-called emission permit) is issued. Thanks to such tools or procedures as the environmental impact assessment and the environmental decision concluding the whole process, it is possible to monitor the impact on the environment by setting out conditions and such an obligation in the environmental decision issued by competent authorities for the particular investment. In addition, the obligation of investors to provide the monitoring data to environmental protection authorities, which would forward the data to the authority responsible for the PHS, or directly to this authority, would be also reasonable.